

Carson MacPherson-Krutsky, Ph.D.

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PROFESSIONAL INTERESTS

Natural Hazard and Risk Education, Disaster Risk Reduction, Disaster Preparedness, Co-Production of Knowledge, Applied/Actionable Science, Information-Seeking and Behavior Change, Design Thinking, User-Centered Design, Community Resilience.

CURRENT POSITION

10/2021-
Present **Research Associate, The Natural Hazards Center, University Colorado Boulder, Boulder, CO (Remote)**
My research uses qualitative and quantitative social science methods to investigate risk communication best practices and factors that influence people to prepare. I also coordinate a monthly webinar series and am one of four people who organize the annual Natural Hazards Workshop which hosts over 600 people in Broomfield, CO.

EDUCATION

2021 **Ph.D. Geosciences, Boise State University, Boise, ID**
Dissertation: Translating risk information into protective action: examining household response to information about earthquake hazards and risk.

2016 **M.S. Geosciences, University of Montana, Missoula, MT**
Thesis: HazardReady – a geographically based natural hazard education and preparedness web application – hazardready.org

2012 **B.S. Geology, Western Washington University, Bellingham, WA**
Concentration: Geophysics, Minor: Mathematics.

PROFESSIONAL EXPERIENCE

5/2021-
9/2024 **Research Associate, Department of Geoscience, Boise State University, Boise, ID**
Develop projects, collect and analyze data to better understand what motivates people to prepare for hazard events. I am currently developing interactive workshops to help Portland, OR residents learn about their earthquake hazards risks and what they can do to prepare.

1/2019-
9/2023 **Co-Founder/Community Engagement Coordinator, Hazard and Climate Resilience Institute at Boise State University, Boise, ID**
Co-founded the institute with Dr. Brand. Dr. Brand and I developed over 500 community connections, organized and facilitated monthly community engagement events, co-wrote grant proposals.

2/2017-
8/2017 **Education Supervisor, The Discovery Center of Idaho, Boise, ID**
Coordinated, supported, and trained both paid and volunteer floor staff at Idaho's only hands-on science center. I oversaw onsite and outreach programs in the Treasure Valley. I was offered full-time salaried position prior to leaving to pursue a Ph.D.

- 5/2016-
Present **Co-Owner/Data Specialist, HazardReady LLC, Missoula, MT**
Create webpage content, acquire and process ArcGIS data, coordinate with web developers. I also collaborate with stakeholders to tailor content to fit user needs. See: HazardReady.org for all active locations.
- 6/2016-
10/2016 **Curriculum Developer, UN Environment Program in Afghanistan, Remote**
Developed 14-week curricula for two disaster management courses, *Science/Hazard Communication* and *Natural Hazard Investigation and Planning in Afghanistan*. I was offered 7-month position in Afghanistan after submitting curriculum.
- 8/2014-
5/2016 **Teaching Assistant, University of Montana, Missoula, MT**
Taught lab portion of introductory geology class. I created exams and extra credit assignments, performed scientific demonstrations, and managed grade books for more than fifty students each semester.
- 6/2015-
7/2015 **Education & Community Engagement (ECE) Intern, UNAVCO, Boulder, CO**
Developed materials to engage early career and graduate students with geodesy and geosciences. As a result of my work, I was asked to and did serve as the student representative for the 2016 ECE Advisory Committee.
- 5/2013-
10/2013 **USGS/NAGT Intern, U.S. Geological Survey, Menlo Park, CA**
Assisted with gravity, magnetic, and magnetotelluric field methods as well as digitizing well log data using ArcMap. *Principal Investigators: Jonathan Glen, Vicki Langenheim, and David Ponce*

Software/Computer Skills: ArcGIS, SPSS (Statistical Analysis Software), Adobe Illustrator, iMovie

Educational products I developed– see [my website](#) to view:

- **Modified Mercalli Intensity Explained Video**, I made a stop-action video with hand drawn images to explain what the Modified Mercalli Intensity Scale is and what it is used for (36,290 views as of June 2022).
- **Document Checklist for Emergencies**, A printable sheet made to help people understand which important documents they should have and why in case of an emergency.
- **Let's Make Infographics – A Science Communication Activity**, I developed an activity to help students think about communicating data through infographics. I successfully ran this activity at a Boise State STEM workshop for high school girls in 2019.

GRANTS, AWARDS & HONORS

Grants

- 2024, \$10,000, University of Colorado Institute of Behavioral Science Seed Grant Funding, *Emergency Alert Systems in Colorado: Exploring the Perspectives of Spanish Speakers* (Principal Investigator/Lead)
- 2023, \$279,709, NSF/NIST Disaster Risk Research Grant, *Household response to wildfire? Integrating behavioral science & evacuation modeling to improve community wildfire resilience.*
- 2023, \$75,000, Boise State Grand Challenges: *Resource Nexus for Sustainability* (Support)

- 2022, \$215,000, FEMA Risk MAP: *Humanizing Flood and Other Hazard Information for Use in Local Resilience Planning* (Principal Investigator/Lead)
- 2020, \$2000, Natural Hazards Center Mitigation Matters Research Grant
- 2018, \$1500, Geological Society of America Graduate Student Research Grant
- 2014, \$750, Geological Society of America Graduate Student Research Grant

Awards & Honors

- 2018, Geological Society of America Geology & Society Division Best Student Paper Award
- 2012, Nomination for USGS/National Association of Geoscience Teachers (NAGT) Internship
- 2012, 2000, \$2000, Emerald City Rotary Scholarships
- 2011, 2010, 2009, NCAA Division II National Champion, WWU Women's Rowing Team
- 2012, 2011, 2010, Full Tuition, WWU Athletic Gender Equity Scholarship
- 2008, Partial Tuition, WWU Haskell Crew Scholarship

COMMUNITY SERVICE/OUTREACH

- 2024–Present, U.S. Fire Administration Wildfire Communications Workgroup – A group of 14 representatives from federal agencies, universities, and private institutions aiming to improve emergency evacuation messaging for fires in the U.S.
- 2024–Present, Language and Accessibility for Alert and Warning Workgroup (LAAWW) - a group of representatives from public and nonprofit agencies working toward greater language and disability access in emergency alert and warning systems in the United States, U.S. Territories, and Tribal Nations. See more: <https://sites.google.com/view/laaww/>.
 - I attend regular meetings and co-authored public comment responses to recent FCC call for comments on alert and warning multilingual templates.
- 2023–Present – Social Science Working Group (SSWG)
 - Presented to the group and provided comments on other presentations.
- 2022–2023, Flash Drought Working Group, NOAA - National Integrated Drought Information System, This working group explored current gaps related to drought monitoring, prediction, and response with a diverse group of stakeholders and aided in planning a Flash Drought Conference.
 - I attended regular meetings and provided direction on conference planning. I also facilitated an interactive session during the 2022 Flash Drought Conference with over 100 attendees.
- 2022, Flood Mitigation Library Steering Committee, Association of State Floodplain Managers. I provided feedback and guidance on the user experience and content for the website www.reducefloodrisk.org.
- 2020–2021, Vice President & Co-founding Member, Geoscience Graduate Organization (GGO), Boise State University, Boise, ID, I was elected by my peers with five other students to establish the GGO. GGO advocates on behalf of all graduate students and works to actively promote a welcoming, respectful, and inclusive environment by partnering with faculty and other university leaders on diversity, equity, and inclusion initiatives.
- 2017–2020, Boise State Student Outreach, Boise, ID, I participated in outreach events with other BSU geology students. I performed demonstrations on earth processes for grades K-12.

- 2014–2016, University of Montana: Developed and led outreach for students from Pre-K to High school focused on natural hazards and earthquake preparedness.

PROFESSIONAL DEVELOPMENT & SERVICE

Professional Development:

- 2023 Simplifying Language Training, University of Colorado Boulder, October 7, virtual.
This 2-hr training reviewed best practices for clear communication. We applied best practices and shared techniques for updating communication for comprehension.
- 2021 Research Mentor Training, Southern California Earthquake Center, July 8-9, virtual.
In this two-day training, I learned strategies for effective mentoring and discussed scenarios and tools to mentor more effectively. Since then, I implemented these strategies with three student mentees.
- 2021 IDEO U Course: Designing Strategy, IDEO, January 21-February 29, virtual.
I took this five-week course (4+ hours per week) with Dr. Brand. We learned how to develop and test a business strategy using design thinking principals. Throughout the course, we applied what we learned to help design a business strategy for the Boise State Hazard and Climate Resilience Institute.
- 2020 Negotiation Theory and Practice Course, Boise State University, April 4-5, Online.
This course presented communication and negotiation theories to assist in understanding, analyzing, and managing conflict and negotiation. The course focused on Ury and Fisher’s negotiation theory and included the influence of style on conflict. The course was pragmatic as well as theoretical.

Professional Service:

- 2024-Present and 2022, Flood Mitigation Library Project Steering Committee Member (see: <https://www.reducefloodrisk.org/>)
- 2023-Present, Language and Accessibility for Alerts and Warning Workgroup Member (see: <https://sites.google.com/view/laaww/>)
- 2023-Present, U.S. Geological Survey Social Science Working Group

Peer-Review for Journals: Natural Hazards, Natural Hazards Review, Geoscience Communication, Annals of Geography

PUBLICATIONS & PRESENTATIONS

Publications:

MacPherson-Krutzky, C., Lindell, M.K., Brand, B., (*submitted to Risk Analysis, expected Fall 2024*), Do engagement best practices motivate preparedness intentions? Data from earthquake workshops for Spanish speakers.

MacPherson-Krutzky, C. (2024, October 10). *Evacuating in disasters like Hurricane Milton isn’t simple – there are reasons people stay in harm’s way.* The Conversation U.S.
<https://theconversation.com/evacuating-in-disasters-like-hurricane-milton-isnt-simple-there-are-reasons-people-stay-in-harms-way-240869>

MacPherson-Krutsky, C., Lindell, M.K., Brand, B. (2022). Residents' information seeking behavior and protective action for earthquake hazards in the Portland, Oregon Metropolitan Area. Risk Analysis. <https://doi.org/10.1111/risa.13916>.

MacPherson-Krutsky C., Brand, B.D., Lindell, M.K. (2022). From information to public preparedness in the Cascadia Subduction Zone: Examining risk communication outcomes in Metropolitan Portland, OR. Earthquake Spectra. January 2022. doi:10.1177/87552930211057582

MacPherson-Krutsky, C. (2021). Translating risk information into protective action: examining household response to information about earthquake hazards and risk, Ph.D. Dissertation, Boise State University, Boise, ID, 179p. (Available via ProQuest)

MacPherson-Krutsky, C. (2020, June 24). *Three Questions to ask yourself the next time you see a graph, chart, or map.* The Conversation U.S., theconversation.com/3-questions-to-ask-yourself-next-time-you-see-a-graph-chart-or-map-141348.

MacPherson-Krutsky, C., Brand, B. D., & Lindell, M. K. (2020). Does updating natural hazard maps to reflect best practices increase viewer comprehension of risk? International Journal of Disaster Risk Reduction, 46. <https://doi.org/10.1016/j.ijdr.2020.101487>

Langenheim, V.E., Brocher, T.M., McPhee, D.K., Earney, T.E., **MacPherson-Krutsky, C.,** Morgan, K.S., Matson, G., and McFaul, R.S., 2018, Digitized sonic velocity log data of the Sacramento Delta region, California: U.S. Geological Survey data release, <https://doi.org/10.5066/P9PYUF17>

MacPherson-Krutsky, C., 2016, HazardReady - A geographically based natural hazard education & preparedness web application, M.S. Thesis, University of Montana, Missoula, MT, 73p. <https://scholarworks.umt.edu/etd/10796/>

Reports, White Papers and Other Materials:

MacPherson-Krutsky, C., Painter, M. A., and Villarreal, M., 2024, Inclusive emergency alerts for Colorado: An assessment and recommendations for language and disability considerations. Natural Hazards Center, University of Colorado Boulder.

MacPherson-Krutsky, C., M. Villarreal, M. Painter (2024). "Sustaining partnerships with socially vulnerable populations—CONVERGE Extreme Events Research Check Sheets Series", in *Sustaining Partnerships with Socially Vulnerable Populations—CONVERGE Extreme Events Research Check Sheets Series*. DesignSafe-CI. <https://doi.org/10.17603/ds2-dptb-tr35>

MacPherson-Krutsky, C., M. Painter, M. Villarreal, 2024, Developing partnerships with socially vulnerable populations—CONVERGE Extreme Events Research Check Sheets Series, in *Developing Partnerships with Socially Vulnerable Populations—CONVERGE Extreme Events Research Check Sheets Series*. DesignSafe-CI. <https://doi.org/10.17603/ds2-qfh8-fs13>

Evans, C., M. Villarreal, **C. MacPherson-Krutsky,** M. Painter, 2024, Positionality for ethical Research Engagement with Socially Vulnerable Groups, in *Developing Partnerships with Socially Vulnerable Populations—CONVERGE Extreme Events Research Check Sheets Series*. DesignSafe-CI. <https://doi.org/10.17603/ds2-3xdj-1r25>

Painter, M.A., Evans, C., Villarreal, M., and **MacPherson-Krutsky, C.,** 2024, "Creating Accessible Materials for People with Visual or Auditory Disabilities, in *Developing Partnerships with*

Socially Vulnerable Populations—CONVERGE Extreme Events Research Check Sheets Series. DesignSafe-CI. <https://doi.org/10.17603/ds2-fc1v-5h68>

Painter, M.A., **MacPherson-Krutzky, C.**, and Villarreal, M., 2024, Enhancing Research Outcomes by Engaging with Decision Makers, in *Developing Partnerships with Socially Vulnerable Populations—CONVERGE Extreme Events Research Check Sheets Series.* DesignSafe-CI. <https://doi.org/10.17603/ds2-v0fz-qr03>

Painter, M.A., Villarreal, M., and **MacPherson-Krutzky, C.**, 2024, How to Develop Research Materials in Languages Other than English. in *Developing Partnerships with Socially Vulnerable Populations—CONVERGE Extreme Events Research Check Sheets Series.* DesignSafe-CI. <https://doi.org/10.17603/ds2-mzwr-gn50>

MacPherson-Krutzky, C., 2023, Using Infographics to Communicate Hazards Research—CONVERGE Extreme Events Research Check Sheets Series", in *Using Infographics to Communicate Hazards Research—CONVERGE Extreme Events Research Check Sheets Series.* DesignSafe-CI. <https://doi.org/10.17603/ds2-pr5v-kr06>

Talks (Asterisk indicates invited talk):*

***MacPherson-Krutzky, C.**, 2024, From Awareness to Action: Strategies for Effective Risk Communication. Guest Lecture in Disaster Risk Reduction for a Resilient World, University of Tübingen, Virtual, May 5, 2024.

***MacPherson-Krutzky, C.**, 2024, What Motivates People to Prepare: Strategies for Effective Risk Communication. Seattle City Hub Captains Monthly Meeting, Virtual, April 25, 2024.

***MacPherson-Krutzky, C.**, 2024, Translating Risk Information into Effective Formats. USGS Social Science Working Group, Monthly Meeting, Virtual, April 18, 2024.

***MacPherson-Krutzky, C.**, Villarreal, M., and Peek, L. (2024, March 14) Inclusive Emergency Alerts: Recommendations for Language and Disability Access. Language and Accessibility in Alert and Warning Workgroup, Monthly Meeting, Virtual.

***MacPherson-Krutzky, C.**, Painter, M.A., Villarreal, M., and Peek, L. (2024, March 12) Inclusive Emergency Alerts: Recommendations for Language and Disability Access. Making Mitigation Work Monthly Webinar, Natural Hazards Center, CU Boulder, Virtual.

***MacPherson-Krutzky, C.**, Painter, M.A., Villarreal, M., and Peek, L. (2024, February 27) HB23-1237 – Inclusive Language in Emergency Situations. Colorado State Legislature, Denver, CO, Study presentation.

MacPherson-Krutzky, C., Brand, B., Lindell, M.K. (2023, July 13) Using Communication Best Practices to Develop Cascadia Earthquake Preparedness Workshops for Spanish Speakers Concurrent Session 5-3. Presented at the Natural Hazards Center Researchers Meeting, Broomfield, CO.

MacPherson-Krutzky, C. (2023, February 28). Risk Communication and Socially Vulnerable Populations, presented at the U.S. Army Corps of Engineers Silver Jackets Monthly Meeting, held virtually.

***MacPherson-Krutsky, C.** (2022, June 22) Building Resilient Communities in Rural Idaho, Presented at the Association of Idaho Cities Annual Conference, Boise, ID.

***MacPherson-Krutsky, C.** (2022, April 11). Translating Risk Information into Protective Action: Examining Household Response to Information About Earthquake Hazards and Risk, Presented at the Institute for Behavioral Science Speaker Series at the University of Colorado, Boulder, held virtually.

***MacPherson-Krutsky, C.** (2022, March 21). Risk Communication and Social Vulnerability: Resources and Worksheets, presented at the U.S. Army Corps of Engineers, Coaching Call: Tools and Resources for Including Environmental Justice and Social Vulnerability Considerations in Your Work, held virtually.

***MacPherson-Krutsky, C.** (2022, January 25) Translating Hazard Risk Information for Specific Audiences: Examples of Existing Efforts and Lessons Learned, presented at the Northern California Earthquake Hazards Workshop, Session: Disparate Hazards & Risk, held virtually.

MacPherson-Krutsky, C., Brand, B., Lindell, M.K. (2021, July 14-15). Examining the Influence Information Seeking Behavior has on Household Preparedness, Concurrent Session 2-5. Presented at the Natural Hazards Center Researchers Meeting, held virtually.

***MacPherson-Krutsky, C.** (2021, June 10). Communicating flood and other hazard risks; using best practices and making it personal, Quarterly Blaine County Local Emergency Planning Committee (LEPC) Meeting, held virtually.

***MacPherson-Krutsky, C.** (2020, October 6). Graphs, Charts, Oh My! Interpreting graphics in the age of information overload. City of Boise Rotary Club Meeting, held virtually.

***MacPherson-Krutsky, C.** (2020, July 16). Coming together to tackle grand challenges related to public health, climate change and beyond: Presented at Idaho Conservation Wild Idaho! Web Series – Part Three: Climate and Public Health, held virtually.

Brand, B. and **MacPherson-Krutsky, C.** (2019, September 24-27). People learn by doing: How to use active-learning to communicate about natural hazard risks: Workshop presented at the Northwest Regional Floodplain Management Association (NORFMA) Annual Conference, Boise, ID.

***MacPherson-Krutsky, C.,** Brand, B., Lindell, M.K., (2018, November 4-7), Using active-learning and goal-setting strategies to promote hazard awareness and preparedness: Abstract: 317780 Presented at Geological Society of America Meeting, Indianapolis, IN.

MacPherson-Krutsky, C., (2016, January 12), MissoulaReady – A geographically based natural hazard education & preparedness web application, Quarterly Missoula County Local Emergency Planning Committee Meeting, Missoula, Montana.

Kittross, S., Rowan, L., **MacPherson-Krutsky, C.,** Morris, A., Bartel, B., (2015, December 13-15), Geodesy Brings the Geoscience Community Together as Geophysicists: Abstract PA23C-05 [Conference Presentation] American Geophysical Union Fall Meeting, San Francisco, California.

Posters:

MacPherson-Krutsky, C., Brand, B., Lindell, M.K., (2020, December 1-17), Planning for the day after tomorrow – investigating factors that motivate households to prepare for disasters: Abstract 751285. [Poster Presentation]. American Geophysical Union Fall Meeting, held virtually.

MacPherson-Krutsky, C. and Brand, B., (2020, June 16-18), Leveraging university capabilities to facilitate regional resilience. [Poster Presentation]. The Disaster and Resilience Summit, Montréal, Québec, Canada, [*Event cancelled due to COVID-19*].

MacPherson-Krutsky, C., Brand, B., Lindell, M.K. (2018, July 8-12). Does updating natural hazard maps to reflect best practices increase viewer comprehension of risk? [Poster Presentation]. Natural Hazards Workshop, Broomfield, CO.

MacPherson-Krutsky, C., Bendick, R., (2015, December 13-15). Synthesizing, summarizing, and sharing natural hazard information for non-scientists: Abstract PA21B-2161. [Poster Presentation]. American Geophysical Union Fall Meeting, San Francisco, CA.

Denton, K.M., Ponce, D.A., Miller, D.M., **MacPherson-Krutsky, C.,** (2013, December 9-13), Carbonatite: a geophysical investigation of rare earth element terrane, eastern Mojave Desert, California: Abstract GP51C-1092. [Poster Presentation]. American Geophysical Union Fall Meeting, San Francisco, CA.

Peacock, J., McPhee, D.K., Ponce, D.A., Mangan, M.T., **MacPherson-Krutsky, C.,** Matson, G., (2013, December 9-13) 3-D visualization of Mono Basin, California from geophysical studies: Abstract V11D-04. [Poster Presentation]. American Geophysical Union Fall Meeting, San Francisco, CA.

Facilitated Trainings:

Scott, P., Bass, D., and **MacPherson-Krutsky, C.** (2024, July 14) Listening Session: Designed to Protect—Human Dimensions of Sheltering [75-min Listening Session]. Natural Hazards Workshop. Broomfield, CO.

MacPherson-Krutsky, C. (2023, February 8-9), Risk Communication and Socially Vulnerable Populations [2- Day Training Course]. Sponsor: U.S. Army Corps of Engineers. Lakewood, CO.

MacPherson-Krutsky, C., Berggren, E., (2022, July 10), Applying Key Risk Communication Principles to Reach Socially Vulnerable Populations [3 Hour Training Session]. Facilitated at the Natural Hazards Workshop. Broomfield, CO.

Press and Interviews:

Ye, Y. (2024, October 9). ‘Evacuating is a privilege’ Why some stay behind when hurricanes strike. CU Boulder Today. University of Colorado Boulder. <https://www.colorado.edu/today/2024/10/09/evacuating-privilege-why-some-stay-behind-when-hurricanes-strike>