# Jessica Embury

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## Education

PhD Geography                                                                              Expected 2027
    Joint Doctoral Program at San Diego State University and University of California, Santa Barbara
    Committee: Atsushi Nara, Somayeh Dodge, Piotr Jankowski, Elizabeth Ackert

MS Geographic Information Science                                                           2023
    San Diego State University
    Dissertation: *Independent Data Validation to Detect Biases in Synthetic Populations*
    Committee: Atsushi Nara, Sergio Rey, Ming-Hsiang Tsou, Sahar Ghanipoor Machiani

BS Geography, with Distinction *summa cum laude*                                            2021
    San Diego State University

Certificate of Geographic Information Science                                               2021
    San Diego State University

## Peer-Refereed Publications

Google Scholar: [https://scholar.google.com/citations?user=S9T9YvEAAAAJ&hl=en&oi=ao](https://scholar.google.com/citations?user=S9T9YvEAAAAJ&hl=en&oi=ao)

1. **Embury, J.**, Dodge, S., Nara, A. (In preparation). Characterization of demographic and socioeconomic biases in mobile location data. [journal article]
2. **Embury, J.**, Nara, A., León, K., Herman, T., Rey, S., Solem, M. (In production). Assessing the effects of geocomputation lessons on secondary school students' perceptions of geography and computer science. *Annals of the American Association of Geographers.* [journal article]
3. **Embury, J.**, Nara, A., Rey, S., Tsou, M. H., & Ghanipoor Machiani, S. (2024). Detecting synthetic population bias using a spatially-oriented framework and independent validation data. *International Journal of Geographical Information Science*, 38(9), 1912–1938. [https://doi.org/10.1080/13658816.2024.2358399](https://doi.org/10.1080/13658816.2024.2358399) [journal article]
4. Nara, A., **Embury, J.**, Velasco, M., Russell, R., Magdy, A., & Dony, C. C. (2024). Preparing for a Career at the Intersection of Geography and Computing: Availability and Access to Training Along Geocomputational Career Pathways. *The Professional Geographer*, 1–29. [https://doi.org/10.1080/00330124.2024.2404911](https://doi.org/10.1080/00330124.2024.2404911) [journal article]
5. Tsou, M. H., Xu, J., Lin, C. D., Daniels, M., **Embury, J.**, Park, J., … Gibbons, J. (2023). Analyzing Spatial-Temporal Impacts of Neighborhood Socioeconomic Status Variables on COVID-19 Outbreaks as Potential Social Determinants of Health. *Annals of the American Association of Geographers*, 113(4), 891–912. [https://doi.org/10.1080/24694452.2022.2149460](https://doi.org/10.1080/24694452.2022.2149460) [journal article]
6. **Embury, J.**, Tsou, M.-H., Nara, A., Oren, E. (2022). A Spatio-Demographic Perspective on the Role of Social Determinants of Health and Chronic Disease in Determining a Population's Vulnerability to COVID-19. *Preventing Chronic Disease*, 19, 210414. [http://dx.doi.org/10.5888/pcd19.210414](http://dx.doi.org/10.5888/pcd19.210414) [journal article]

7. Lowery, B. C., Swayne, M. R., Castro, I., **Embury, J**. (2022). Mapping EBT Store Closures During the COVID-19 Pandemic in a Low-Income, Food-Insecure Community in San Diego. *Preventing Chronic Disease*, 19, 210410. http://dx.doi.org/10.5888/pcd19.210410 [journal article]
8. **Embury, J.**, Nara, A., Jin, C. (2022, November 1). Spatially weighted structural similarity index: A multiscale comparison tool for diverse sources of mobility data. In *HANIMOB'22: The 2nd ACM SIGSPATIAL International Workshop on Animal Movement Ecology and Human Mobility Proceedings*, 19-22. Seattle, WA. https://doi.org/10.1145/3557921.3565542 [conference paper]

## Non-Refereed Publications

1. **Embury, J.**, and Nara, A. (2022, November 10). Closing the Gap between Curriculum and the Professional Realities of the Geospatial Technology Industry. *American Association of Geographers*. https://doi.org/10.14433/2017.0122 [online article]
2. **Embury, J.** (2021). Identification of High-Risk Dry Cleaning Sites in San Diego County: Spatial Analysis. *The Sage Project at San Diego State University*. Available at: https://digitallibrary.sdsu.edu/islandora/object/sdsu%3A139137 [technical report]
3. Tsou, M.-H., Xu, J., Lin, C.-D., Daniels, M., **Embury, J.**, Ko, E., Gibbons, J. (2021). Analyzing Socioeconomic Factors and Health Disparity of COVID-19 Spatiotemporal Spread Patterns at Neighborhood Levels in San Diego County. *medRxiv*. https://doi.org/10.1101/2021.02.22.21251757 [pre-print]

## Grants and Awards

### Competitive Grants and Fellowships

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| 2022-2023 | College of Graduate Studies, San Diego State University *University Graduate Research Fellow* |
| 2022-2023 | College of Graduate Studies, San Diego State University *Completion of Research and Creative Activity Fellow* |

### Awards and Recognition

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| 2024 | Thomas C. Strand Endowed Scholarship in Geography, Department of Geography, San Diego State University |
| 2024 | Travel Grant, 86th Annual Conference of the Association of Pacific Coast Geographers |
| 2023 | Geography Scholarship, Department of Geography, San Diego State University |
| 2022 | George and Evelyn Parrott Memorial Endowed Scholarship in Geography, Department of Geography, San Diego State University |
| 2022 | ACM SIGSPATIAL Travel Grant, 30th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2022) |
| 2021, 2022 | Richard Wright Cartography Award Scholarship, Department of Geography, San Diego State University |
| 2021-2022 | Master's Research Scholarship, College of Graduate Studies, San Diego State University |
| 2021 | Marble-Boyle Undergraduate Achievement Award in Geographic Science, American Association of Geographers (AAG) |
| 2021 | Geosystems Applied Geography and Earth Systems Paper Award, Association of Pacific Coast Geographers Annual Conference (APCG) |
| 2021 | Esri Innovation Program Student-of-the-Year Award, Esri Innovation Program (EIP) at San Diego State University |
| 2021 | Alvena Storm Memorial Scholarship, Department of Geography, San Diego State University |

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| 2021 | Undergraduate Research Excellence Award, Student Research Symposium at San Diego State University |
| 2020-2021 | Outstanding Graduating Senior, Department of Geography, San Diego State University |
| 2019, 2020 | McFarland Geography Scholarship, Department of Geography, San Diego State University |

## Presentations

Conference Activity

1. **Embury, J.**, Dodge, S., Nara, A. *Understanding demographic data bias in mobile location datasets*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, Detroit, MI, 2025.

2. **Embury, J.**, Nara, A. *Evaluating The Impact Of Geocomputation Lessons On Secondary School Students' Perceptions Of Geography And Computer Science*. Paper presented at 86th Annual Conference of the Association of Pacific Coast Geographers, Arcata, CA, 2024.

3. Dony, C., Nara, A., León, K., **Embury, J.**, Herman, T., Velasco, M. *Partnering on education research with teachers and with funding to measure aspirations of students*. Paper presented at the 109th Annual Conference of the National Council for Geographic Education, Tempe, AZ, 2024.

4. León, K., Herman, T., Nara, A., **Embury, J.**, Dony, C. *Encoding Geography: Integrating Computer Science into Geography Instruction*. Paper presented at the 109th Annual Conference of the National Council for Geographic Education, Tempe, AZ, 2024.

5. **Embury, J.** *Detecting biased mobility patterns in a synthetic population*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, Honolulu, HI, 2024.

6. **Embury, J.**, Jankowski, P., Castro, I., Nara, A. *Community Asset-Based Approach for Optimizing the Selection of Fresh Produce Access Points*. Paper presented at The 70th North American Meetings of the Regional Science Association International & the XVII Spatial Econometrics Association World Conference, San Diego, CA, 2023.

7. **Embury, J.**, Nara, A. *A Framework for the Comparative Analysis of Diverse Mobility Data*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, Denver, CO, 2023.

8. **Embury, J.**, Nara, A. *Spatially-explicit validation of an agent-based model of human activity and mobility*. Paper presented at the 30th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, Seattle, WA, 2022.

9. **Embury, J.**, Tsou, M.-H., Nara, A., Oren, E. *The dynamic roles of chronic disease, socioeconomic factors, and mobility on population vulnerability during the COVID 19 pandemic*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, 2022.

10. **Embury, J.**, Castro, I. *Tackling Food Insecurity in the San Diego Promise Zone: A Spatial Demographic Approach*. Paper presented at the 83rd Annual Conference of the Association of Pacific Coast Geographers, San Diego, CA, 2021.

11. **Embury, J.**, Tsou, M.-H. *Mapping COVID-19 in Local Communities: A San Diego Case Study*. Paper presented at the American Association of Geographers (AAG) Annual Meeting, 2021.

12. **Embury, J.**, Tsou, M.-H. *COVID-19 and Population Vulnerability in San Diego County*. Paper presented at the 14th Annual Student Research Symposium at San Diego State University, 2021.

13. **Embury, J.**, Nara, A. *Associations between Temperature Variables and Heat-Related Deaths in the Contiguous United States*. Poster presented at the 13th Annual Student Research Symposium at San Diego State University, San Diego, CA, 2020.

14. **Embury, J.**, Tsou, M.-H. *Bars, Major Restaurants, and Food Chains in San Diego County: COVID 19 Reopening Risk*. Map presented at the 40th Annual Conference of the North American Cartographic Information Society (NACIS), 2020.
15. **Embury, J.**, Tsou, M.-H. *2017 Hospitalizations of Seniors in San Diego County*. Map presented at the Esri User Conference, 2020.

Invited Talks
1. Castro, I., **Embury, J.** *BrightSide Produce – Tackling Food and Nutrition Security*. Invited talk at the Healthy Communities Working Group, Economic Development Department, City of San Diego meeting, April 21, 2022.
2. Alo, T., Barlow, J., Graves, C., **Embury, J.**, Dykstra, C. *An SDSU-Water Board Partnership to Identify Historical Dry Cleaner Sites*. Invited talk at the San Diego Regional Water Quality Control Board, State of California quarterly meeting, June 9, 2021.

# Professional Service Activities
## Disciplinary
- Student representative (elected)                                              2025-2027
  Spatial Analysis and Modeling Specialty Group, American Association of Geographers
- Student representative (ad hoc)                                              2024-2025
  Spatial Analysis and Modeling Specialty Group, American Association of Geographers
- Conference session co-organizer                                              2024
  *Exploring Geospatial Methods and Human Dynamics to Address Challenges of the Sustainable Development Goals (SDGs)*
  American Association of Geographers 2024 Annual Meeting
- Reviewer for Springer Nature's *Discover Social Science and Health*          2024-2025

## University and Departmental
- Website administrator and records manager                                    2021-2023
  Geography Graduate Student Association, San Diego State University
- Student representative, Computing Committee                                  2022-2023
  Department of Geography, San Diego State University
- Student representative, Diversity Committee                                  2021-2022
  Department of Geography, San Diego State University

# Research Experience
## Research Labs
- Center for Human Dynamics in the Mobile Age, San Diego State University       2020-present
- Movement Data Science Lab, University of California, Santa Barbara            2024-2025

## Projects
- National Science Foundation, Award No. 2031407                               2021-2024
  *Collaborative Research: Encoding Geography - Scaling up an RPP to achieve inclusive geocomputational education*
  Supervisor(s): Atshushi Nara (PI)

- National Science Foundation, Award No. 2228419          2022-2023
  *CIVIC-PG Track B Walk to Healthy Foods: Modeling Community-Based Assets to*
  *Increase Healthy Food Access in Underserved Communities*
  Supervisor(s): Iana Castro (Co-PI), Piotr Jankowski (Co-PI)
- National Science Foundation, Award No. 2348836          2021
  *EAGER: Innovation in Society Study Group*
  Supervisor(s): Ming-Hsiang Tsou (Co-PI), Atsushi Nara
- National Institutes of Health, Award No. 3U54CA132384-10S1          2020-2021
  *RADx-UP Initiative: Communities Fighting COVID!*
  Supervisor(s): Eyal Oren (Co-PI), Ming-Hsiang Tsou

## Teaching Experience

2022-2025    **Teaching Assistant**, Department of Geography, San Diego State University
             Course(s): Data Management for GIS, GIS Programming with Python, GIS Scripting
             Fundamentals
2019         **Geography Tutor**, Earth Sciences Department, Grossmont College
             Course(s): Introduction to Geographic Information Science, Physical Geography,
             Physical  Geography Lab, Human and Cultural Geography

## Related Professional Experience

2019-2020    **GIS and Biological Monitoring Intern**, Open Space Division, Parks and Recreation,
             City of San Diego

## Certifications

Expected 2025  Identity and Allyship Awareness Badge, San Diego State University
2025           Academic Applications of AI (AAAI) Micro-credential, San Diego State University

## Skills

Research Skills
- GIS methodologies
- Qualitative and quantitative analysis
- IRB protocol development
- Cartography
- Database management
- API data collection
- Project management
- Technical writing

Scripting Languages
- Python
- SQL
- HTML and CSS
- Familiarity with JavaScript, R, Java

Computer Software
- ArcGIS Pro, ArcGIS Online
- Esri Apps, Dashboards, StoryMaps
- PostgreSQL, PostGIS
- Git, GitHub
- LINGO
- Microsoft Office Suite