

Curriculum Vitae

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Academic Interests

I am broadly interested in combining data science techniques and large-scale survey data with geographic data science methods to expand the scientific understanding of gender and human equality, particularly in historically underdeveloped countries.

Currently, I am exploring methods to quantitatively measure women's equality. My aim is to uncover which variables and categories are most directly connected to changes in empowerment in everyday women's lives. I am also exploring how machine learning methods can enhance measurements of women's empowerment by imputing missing data and expanding estimations beyond current survey boundaries.

Skills and Qualifications

Technical: R, git, machine learning methods, data mining, data visualization, spatial and temporal interpolation, GIS, systems and network administration

Academic: writing and publication of academic papers, creating and giving presentations to policy stakeholders, working both independently and in conjunction with multidisciplinary teams

Education

July, 2021 (expected)	Ph.D. Ecology, University of California, Davis. Adviser: Robert Hijmans Dissertation Topic: Women's empowerment in sub-Saharan Africa
2016	M.S. Ecology, University of California, Davis. Adviser: Robert Hijmans
2005	B.S. Zoology <i>cum laude</i> (Honors College), Michigan State University
2001	Diploma (<i>salutatorian</i>), Grass Lake High School, Grass Lake, Michigan.

Publications (ORCID: 0000-0003-4258-8052)

Rettig, E. M. & Hijmans, R.J. (2021). Women's empowerment in sub-Saharan Africa. Manuscript submitted for publication.

Rettig, E. M., Fick, S. E., & Hijmans, R. J. (2020). The Female Empowerment Index (FEMI): spatial and temporal variation in women's empowerment in Nigeria. *Heliyon*, 6(5), e03829. <https://doi.org/10.1016/j.heliyon.2020.e03829>

Brown, K. H., Engle-Stone, R., Kagin, J., **Rettig, E. M.**, & Vosti, S. A. (2015). Use of Optimization Modeling for Selecting National Micronutrient Intervention Strategies: An Example Based on Potential Programs for Control of Vitamin A Deficiency in Cameroon. *Food and Nutrition Bulletin*, 36(Supplement 3), S141–S148. <https://doi.org/10.1177/0379572115599325>

Kagin, J., Vosti, S. A., Engle-Stone, R., **Rettig, E. M.**, Brown, K. H., Nankap, M., & Ndjebayi, A. O. (2015). Measuring the Costs of Vitamin A Interventions: Institutional, Spatial, and Temporal Issues in the Context of Cameroon. *Food and Nutrition Bulletin*, 36(Supplement 3), S172–S192. <https://doi.org/10.1177/0379572115598445>

Vosti, S. A., Brown, K. H., Engle-Stone, R., Kagan, J., **Rettig, E. M.**, & Murphy, R. (2014). An Economic Optimization Tool for Micronutrient Interventions in Cameroon. *The Micronutrient Forum*. <http://micronutrientforum.org/>

Presentations

Rettig, E.M. Spatial Analysis of Expansion Country Selection Methods. Oral Presentation at: Cameroon MINIMOD Policy Stakeholder Workshop, May, 2015. Yaounde, Cameroon.

Academic Honors, Grants, and Scholarships

University of California, Davis

Davis, CA

2021 Citrus EDGE in STEM Mentoring Fellowship

2020 Graduate Group in Ecology Internal Fellowship

2020 H.A. Jastro Shields Research Stipend Award

2019 H.A. Jastro Shields Fellowship

2010-2012 Graduate Group in Ecology Incoming Internal Student Fellowship

Michigan State University

East Lansing, MI

2005 Honors College Graduate, Michigan State University

Academic Employment

Ph.D. Student, Graduate Group in Ecology, University of California, Davis

Davis, CA

Research:

2017-current Women's Empowerment in sub-Saharan Africa.

Development of a subnational spatial index of women's empowerment in Africa combining various survey data such as Demographic and Health Services (DHS) and Multiple Indicator Cluster Surveys (MICS).

2012-2016 Micronutrient Intervention Modeling Project (MINIMOD)

Worked in conjunction with a multidisciplinary team to choose a Phase III country in which to expand subnational vitamin A deficiency models and economic cost models for precision targeting for children under five

2014-2015 Demographic and Health Services (DHS) Data Visualization Project

Automated data scraping and visualization of various key DHS variables such as access to electricity, stunting and wasting in children, access to family planning services, etc.

2011 Iran Wheat Landrace Database Development
Created an access database for tracking the history of Iranian wheat landraces based on historical data

Teaching/Academic

2012-current TA - Intro to Ecology and Evolution (BIS2B)
2018-2019 Reader/Grader - Intro to Ecology and Evolution (BIS2B)
2016/2019 TA/Guest Lecturer - Concepts and Methods in Geographic Information Systems (ABT 181N)

Undergraduate Researcher, Michigan State University East Lansing, MI
2009-2010 Volunteer Researcher - Digital Evolution Lab (PI: Charles Ofria).
Shell programming to help automate AVIDA software runs for research.
2009 Volunteer Researcher - Fruit Fly Behavioral Ecology (PI: Christoph Adami).
Bred fruit flies for behavioral ecology experiments.
2002 Volunteer Student Researcher - Sociological Effects of 9/11 (PI: Bernard Finifter).
Searched through newspapers and other media sources for references to 9/11 to better understand its effects on the American psyche.

Other Employment

2012 EPPI, Inc. - Systems Administrator/Programmer. Berkeley, CA (remote)
2009-2010 Artemis Solutions Group - Website QA/Programmer. East Lansing, MI
2006-2009 Courtland Consulting East Lansing, MI
2007-2009 - Systems/Network Administrator.
Maintained website and e-mail services using both windows and linux server architectures.
2006-2007 Helpdesk Analyst - Michigan Department of Education.
Technical assistance for local and charter schools in reporting to ensure that students with disabilities were given full access to public education per Federal Law.
2005-2006 Peace Corps - Crop Extensionist Alto Parana, Paraguay
Worked with local subsistence farmers to improve soil quality and yields of cash crops using low-technology approaches such as cover crops, improving soil nitrogen availability, and increasing soil organic matter.

Volunteer Work

2021 Sunburst Projects - Data Consultant Sacramento, CA

Designed and implemented a new method to convert poorly-formulated patient data to a usable state. Helped develop technical project specifications. General consulting on project development.

2011-current Alternatives to Violence Project CA - facilitator/apprentice lead facilitator

CA (various locations)

Volunteered inside several California correctional institutions as a facilitator within a team consisting of inmates and community members to develop and deliver 20-hour workshops on conflict resolution and alternate approaches to avoid violence within inmate populations.

2013-2017 Coach/Manager - Sacramento Valley Softball

Sacramento, CA

2005-2006 Peace Corps - Crop Extensionist Alto Parana, Paraguay

Worked with local subsistence farmers to improve soil quality and yields of cash crops using low-technology and environmentally-friendly approaches such as cover crops, improving soil nitrogen availability, and increasing soil organic matter.

2004-2005 Student Mentor - Gifted and Talented Exchange (GATE)

East Lansing, MI

Worked with gifted K-12 students to help them learn topics of their choice that were outside of the standard curriculum.