Megan M. Wheeler

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School of Life Sciences · Arizona State University · Tempe, AZ · 85287-4601

EDUCATION

Arizona State University, *Tempe, AZ* August 2015 - Present

Ph.D. Candidate, Environmental Life Sciences

- ◇ Advisor: Dr. Sharon Hall
- ◇ Comprehensive exams and proposal defense completed November 2017
- ◇ Cumulative GPA: 4.0

Harvey Mudd College, *Claremont, CA* May 2013

Bachelor of Science, Mathematical and Computational Biology

- ◇ Graduated with Honors
- ◇ Graduated with Distinction in Biology

Marine Biological Laboratory, *Woods Hole, MA* Fall 2011

Semester in Environmental Science Program

AWARDS AND HONORS

- ◇ Travel Award, ASU School of Life Sciences — August 2018
- ◇ Lisa Dent Memorial Ecology Fellowship — March 2018
- ◇ Graduate Research and Support Program Award, ASU Graduate and Professional Student Association — March 2018
- ◇ Poster Award Runner Up, Central Arizona-Phoenix LTER All Scientists Meeting — January 2018
- ◇ Teaching Excellence Award, ASU Graduate and Professional Student Association — November 2017
- ◇ Graduate Grant, Central Arizona-Phoenix LTER — May 2017
- ◇ PRS Probe Research Award, Western Ag — February 2017
- ◇ Student Poster Award, Central Arizona-Phoenix LTER All Scientists Meeting — January 2017
- ◇ Travel Award, ASU School of Life Sciences — December 2016
- ◇ Mindlin Prize for Innovative Ideas in Science — May 2013
- ◇ Outstanding Thesis Award, Harvey Mudd College Biology Department — May 2013
- ◇ Dean's List — 2009-2013
- ◇ National Merit Scholar — 2009-2013
- ◇ Summer Research Award, HMC Center for Environmental Studies — Summer 2012

RESEARCH INTERESTS

- ◇ Homogenization of urban environments
- ◇ Social and ecological drivers of plant community dynamics in residential landscapes
- ◇ Data management and visualization in R

PEER-REVIEWED PUBLICATIONS

- ◇ 2018. D. Locke, M. Avolio, T.L.E. Trammell, R. Roy Chowdhury, J. M. Grove, J. Rogan, D.G. Martin, N. Bettez, J. Cavender-Bares, P.M. Groffman, S.J. Hall, J.B. Heffernan, S.E. Hobbie, K.L. Larson, J.L. Morse, C. Neill, K.C. Nelson, L.A. Ogden, J. O'Neil-Dunne, D.E. Pataki, W.D. Pearse, C. Polsky, and **M.M. Wheeler**. A multi-city comparison of front and backyard differences in plant species diversity and nitrogen cycling in residential landscapes. Landscape and Urban Planning 178:102-111.

- ◇ 2017. **Wheeler, M.M.**, C. Neill, P.M. Groffman, M. Avolio, N. Bettez, J. Cavender-Bares, R.R. Chowdhury, L. Darling, M. Grove, S.J. Hall, J.B. Heffernan, S.E. Hobbie, K.L. Larson, J.L. Morse, K.C. Nelson, L.A. Ogden, J. O'Neil-Dunne, D.E. Pataki, C. Polsky, M. Steele, and T.L.E. Trammell. Continental-scale homogenization of residential lawn plant communities. Landscape and Urban Planning 165: 54-63.
- ◇ 2016. **Wheeler, M.M.**, M.M. Dipman, T.A. Adams, A.V. Ruina, C.R. Robins, W.M. Meyer III. Carbon and nitrogen storage in California sage scrub and non-native grassland habitats. Journal of Arid Environments 129: 119-125.
- ◇ 2015. **Wheeler, M.M.**, C. Neill, E. Loucks, A. Weiler, B. Von Holle, M. Pelikan, and T. Chase. Vegetation removal and seed addition contribute to coastal sandplain grassland establishment on former agricultural fields. Restoration Ecology 23: 539-547.
- ◇ 2015. Neill, C., **M.M. Wheeler**, E. Loucks, A. Weiler, B. Von Holle, M. Pelikan, and T. Chase. Influence of soil properties on coastal sandplain grassland establishment on former agricultural fields. Restoration Ecology 23: 531-538.

RESEARCH PRESENTATIONS

(*) indicates mentored student

- ◇ August 2018. **Wheeler, M.M.**, K.L. Larson, E.M. Cook, and S.J. Hall. "Land managers drive plant community dynamics: A case study of change over time in Phoenix residential neighborhoods." Seminar presented at the Ecological Society of America Meeting, New Orleans, LA.
- ◇ January 2018. **Wheeler, M.M.**, S.L. Collins, N.B. Grimm, C. Clark, R.A. Sponseller, E.M. Cook, and S.J. Hall. "Global change in the desert: Effects of increased nitrogen on diverse annual plant communities." Poster presented at the Central Arizona-Phoenix LTER All Scientists Meeting, Tempe, AZ.
- ◇ January 2018. *Ribiero, C., **M.M. Wheeler**, L. Steger, and S.J. Hall. "Shrubs alter patterns of inorganic nitrogen availability in native desert parks across metropolitan Phoenix." Poster presented at the Central Arizona-Phoenix LTER All Scientists Meeting, Tempe, AZ.
- ◇ January 2018. *Beauclaire Reyes, C., *A. Bailey, L. Steger, **M.M. Wheeler**, and S.J. Hall. "Plant species diversity and community composition of alternative yards in Phoenix, AZ." Poster presented at the Central Arizona-Phoenix LTER All Scientists Meeting, Tempe, AZ.
- ◇ August 2017. **Wheeler, M.M.**, S.L. Collins, N.B. Grimm, C. Clark, R.A. Sponseller, and S.J. Hall. "Global change in the desert: Effects of increased nitrogen on diverse annual plant communities." Poster presented at the Ecological Society of America Meeting, Portland, OR.
- ◇ January 2017. **Wheeler, M.M.**, E.R. Vivoni, and S.J. Hall. "Evaluation of a soil water model to improve outdoor water use recommendations in an arid city." Poster presented at the Central Arizona-Phoenix LTER All Scientists Meeting, Tempe, AZ.
- ◇ February 2016. **Wheeler, M.M.**, J. Learned, H. Heavenrich, and S.J. Hall. "Regional Patterns and Homogenization of Residential Yard Soil Moisture in US Cities." Poster presented at the INTERFACE Frontiers in Terrestrial Climate Feedbacks Workshop, St. Pete's Beach, FL.
- ◇ August 2015. **Wheeler, M.M.**, C. Neill, P.M. Groffman, M. Grove, N. Bettez, J. Cavender-Bares, J.B. Heffernan, S.J. Hall, S.E. Hobbie, K.L. Larson, J.L. Morse, K.C. Nelson, L.A. Ogden, J. O'Neil-Dunne, D.E. Pataki, C. Polsky, R.R. Chowdhury, T. Trammell, M. Steele, W.D. Pearse, L. Darling, and M. Avolio. "Continental-scale Homogenization of US Urban Lawn Vegetation." Seminar presented at the Ecological Society of America Annual Meeting, Baltimore, MD.

- ◇ August 2014. Meyer III, W.M., W.J. Staubus, **M.M. Wheeler**, M.M. Dipman, and D.M. Spear. "Conservation Importance of Native Coastal Sage Scrub and Non-native Grassland Habitat Patches in Urban/Suburban Los Angeles County, California, USA." Seminar presented at the Ecological Society of America Annual Meeting, Sacramento, CA.
- ◇ April 2014. **Wheeler, M.M.** and C. Neill. "Effects of Vegetation Removal, Seed Limitation and Soil Chemistry on Sandplain Grassland Creation on Former Agricultural Fields." Seminar presented at the Society for Ecological Restoration New England Chapter Regional Conference, Amherst, MA.
- ◇ May 2013. **Wheeler, M.M.** "Carbon Storage in Southern California Coastal Sage Scrub and Non-Native Grassland Habitats." Senior Thesis Final Presentation, Harvey Mudd College, Claremont, CA.
- ◇ April 2013. **Wheeler, M.M.** "Carbon Storage in Southern California Coastal Sage Scrub and Non-Native Grassland Habitats." Seminar presented at the West Coast Biological Sciences Undergraduate Research Conference, Point Loma, CA.
- ◇ November 2012. **Wheeler, M.M.** "Effects of Hummingbird Feeders on Hummingbird Populations in Suburban and Natural Landscapes." Seminar and poster presented at the Center for Environmental Studies Annual Banquet, Harvey Mudd College, Claremont, CA.
- ◇ December 2011. **Wheeler, M.M.** "Effects of Fertilizer on Nitrogen Cycling in Residential Cape Cod Lawns." Seminar presented at the Semester in Environmental Science Independent Research Symposium, Marine Biological Laboratory, Woods Hole, MA.

RESEARCH EXPERIENCE

Change in Phoenix residential plant communities over time Spring 2018 - present
Arizona State University, Tempe, AZ

- ◇ Repeated a vegetation survey of 400 Phoenix front yards originally conducted in 2008 to record changes in the plant community over a ten year period.
- ◇ Designed and implemented a social survey of Phoenix residents in conjunction with front yard vegetation sampling.

Impact of N fertilization on desert ephemeral plant communities Spring 2017 - present
Arizona State University, Tempe, AZ

- ◇ Long term nutrient addition experiment in Sonoran Desert parks.
- ◇ Analyzed long-term experimental data on ephemeral plant community composition collected as part of the Central Arizona-Phoenix Long Term Ecological Research project.
- ◇ Presented results as a poster at an international conference and currently preparing a manuscript for submission.
- ◇ Mentored an undergraduate research assistant working on related soil nitrogen data.

Alternative residential yard futures Spring 2017 - present
Arizona State University, Tempe, AZ

- ◇ Comparison of alternative yard types in residential landscapes across the US.
- ◇ Assisted with protocol development for plant composition and soil nutrient analyses.
- ◇ Coordinated and carried out fieldwork in Phoenix residential yards.
- ◇ Designed and implemented a mobile app data collection system.
- ◇ Communicated research results with non-scientist participants.
- ◇ Maintained communication with a national network of researchers.
- ◇ Mentored undergraduate research assistants working on initial data analysis and presentation.

Soil moisture in alternative yard types Fall 2015 - Fall 2016
Arizona State University, Tempe, AZ

- ◇ Evaluation of a residential surface soil moisture model for two Phoenix yard types.
- ◇ Compared predicted model soil moisture with measured values using a multi-year time series.
- ◇ Presented results as a poster at a local meeting.

Ecological homogenization of urban America Fall 2014 - Fall 2016
Marine Biological Laboratory, Woods Hole, MA

- ◇ Publication: Wheeler et al. (2017) Landsc. Urban Plan. 165
- ◇ Tested the urban homogenization hypothesis in residential landscapes across the US.
- ◇ Compiled and analyzed lawn plant community composition data from residential yards in six US cities.
- ◇ Developed results into a manuscript for publication and presented results in a seminar at an international conference.
- ◇ Worked collaboratively with a national research team.
- ◇ Maintained a local network of air temperature and soil moisture sensors.

Woody encroachment control in sandplain grassland Summer 2013 - Summer 2015
Marine Biological Laboratory, Woods Hole, MA

- ◇ Tested the effectiveness of grazing and mowing interventions to prevent the spread of shrubs into rare sandplain grassland communities.
- ◇ Set up permanent vegetation sampling plots and worked with a botanist to identify all plant species in two grass and shrubland field sites.
- ◇ Developed protocols for and carried out experimental cattle grazing and mowing treatments.
- ◇ Trained and led a team of four field researchers in experimental setup and data collection.

Agricultural grassland restoration to sandplain grassland Summer 2013 - Fall 2015
Marine Biological Laboratory, Woods Hole, MA

- ◇ Publications: Wheeler et al. (2015) Restoration Ecol. 23, Neill et al. (2015) Restoration Ecol. 23
- ◇ Evaluated the effectiveness of multiple vegetation and soil treatments in restoring sandplain grassland plant species to former agricultural fields.
- ◇ Identified grassland vegetation in permanent experimental plots.
- ◇ Compared community composition over time in multiple experimental treatments.
- ◇ Worked collaboratively with researchers at The Nature Conservancy, Martha's Vineyard.
- ◇ Wrote two manuscripts on experimental results.
- ◇ Presented results in a seminar at a local conference.

C and N storage in Southern California plant communities Fall 2012 - Spring 2013
Harvey Mudd College, Claremont, CA

- ◇ Publication: Wheeler et al. (2016) J. Arid Environ. 129
- ◇ Comparison of carbon and nitrogen storage in coastal sage scrub, non-native grassland, and recovering coastal sage scrub habitats.
- ◇ Collected soil, plant litter, shrub, and grass samples from field sites.
- ◇ Measured carbon and nitrogen content of sampled materials using an elemental analyzer.
- ◇ Created allometric equations relating shrub biomass to stem basal diameter measurements.
- ◇ Developed undergraduate thesis report into a manuscript for publication.
- ◇ Presented results as a poster at a local conference.

Hummingbird feeders and local abundance Summer 2012

HMC Center for Environmental Studies, Claremont, CA

- ◇ Independent study on hummingbird abundance in suburban and natural environments and the effects of adding hummingbird feeders to these environments.
- ◇ Performed point counts of three hummingbird species in suburban and natural environments while providing additional food in hummingbird feeders.
- ◇ Presented results as a poster and seminar at an institutional meeting.

Lawn fertilization and N cycling Fall 2011

Marine Biological Laboratory, Woods Hole, MA

- ◇ Studied the effects of fertilizer addition on nitrogen cycling in residential lawns.
- ◇ Collected soil and grass samples from residential lawns.
- ◇ Measured total nitrogen and $\delta^{15}N$ isotope content of grass and soils, nitrate and ammonium stocks in soils, and nitrification and N mineralization rates.
- ◇ Correlated lawn fertilization information with $\delta^{15}N$ isotope and UniSpec reflectance data to predict fertilization rates of additional lawns.
- ◇ Presented results in a seminar at an institutional meeting.

Properties of a stratified lake Summer 2011

Harvey Mudd College, Claremont, CA

- ◇ Characterized physical, chemical, and bacterial properties of a monomictic lake.
- ◇ Conducted water quality analyses of lake water samples at different depths.
- ◇ Designed and executed a 24-hour survey of temperature versus depth over time to better understand lake mixing behavior.

TEACHING EXPERIENCE

Course Development

Arizona State University, Tempe, AZ

- ◇ BIO 151: Biological Thinking Summer 2017
  Developed and modified lesson plans for a large active learning-style undergraduate class.

Teaching Assistant

Arizona State University, Tempe, AZ

- ◇ BIO 151: Biological Thinking, Lecture Fall 2015, 2016, 2017
  Assisted the instructor in planning and preparing lessons, answered student questions and facilitated biweekly active learning sessions.
- ◇ BIO 282: Conceptual Approaches to Biology for Majors II, Recitation Spring 2016
  Ran weekly active learning recitation sections.

SERVICE AND OUTREACH

- ◇ CAP LTER Graduate Student Representative Fall 2016 - Present
  Grad student liaison between CAP student group, faculty, and administration. Organized and led regular student social and academic events.
- ◇ Instructor with Graduate Partners in Science Education Fall 2016 - Present
  Developed lesson plans and taught after school science clubs for middle school students.
- ◇ Scientist with Letters to a Pre-Scientist Fall 2016 - Present
  Corresponded with middle school pen pals about college, science, and life.
- ◇ Assistant Event Supervisor for Arizona Science Olympiad Spring 2017, 2018
  Collaboratively wrote and administered a middle school Science Olympiad test.

- ◇ Volunteer with ASU School of Life Sciences at the Phoenix Zoo Party for the Planet April 2018
  Assisted with a table demonstrating plant movement at the Phoenix Zoo's Earth Day celebration.
- ◇ Panelist for the ASU School of Life Sciences Undergraduate Research Program March 2018
  Poster Presentation Panel
  Answered questions and shared experience with presenting research posters for undergraduate researchers.
- ◇ Member of the Hugh Hansen Selection Committee Spring 2018
  Selected speakers for School of Life Sciences ecology lecture series.
- ◇ Panelist for the ASU SOLS New Teaching Assistant Panel August 2016, 2017, 2018
  Shared strategies and answered questions for new graduate student teaching assistants.
- ◇ Instructor for Introductory R Workshop June 2017
  Designed and taught a one-day introductory workshop on data manipulation in R for undergrad and graduate students.
- ◇ Volunteer with Science is Fun at Phoenix March for Science April 2017
  Engaged children and adults in hydrology and composting demonstrations.
- ◇ Instructor with Harvey Mudd College Science Bus Fall 2012
  Taught elementary school students weekly science lessons.

MENTORING

- ◇ Alicia Flores Summer 2018
  Undergraduate researcher. Worked together on field and social survey data collection.
- ◇ Dena Bergman Summer 2018
  Undergraduate researcher. Worked together on plant identification and social survey data collection.
- ◇ Brittany Strobel Summer 2018
  REU student. Helped with development and execution of a research project on urban plant sources.
- ◇ Alyssa Bailey Fall 2017 - Spring 2018
  Undergraduate researcher. Taught field and data analysis techniques and helped develop a poster for presentation at a local meeting.
- ◇ Anna He Spring 2018
  High school volunteer. Taught field and data analysis techniques.
- ◇ Christal Beauclaire Reyes Summer 2017 - Fall 2017
  Undergraduate researcher. Taught field and data analysis techniques and helped develop a poster for presentation at a local meeting.
- ◇ Caitlin Ribeiro Fall 2017
  Undergraduate researcher. Taught field and data analysis techniques and helped develop a poster for presentation at a local meeting.

MEETINGS AND WORKSHOPS ATTENDED

- ◇ August 2018. Ecological Society of America Annual Meeting. New Orleans, LA.
- ◇ May 2018. Interdisciplinary Translation Workshop. Tempe, AZ.
- ◇ January 2018. Central Arizona-Phoenix LTER All Scientists Meeting. Tempe, AZ.
- ◇ December 2017. Graduate TA Online Certification Training. Tempe, AZ.
- ◇ August 2017. Ecological Society of America Annual Meeting. Portland, OR.
- ◇ August 2017. Advanced Community Data Analysis Using the vegan Package in R. Workshop at ESA 2017. Portland, OR.
- ◇ January 2017. Central Arizona-Phoenix LTER All Scientists Meeting. Tempe, AZ.
- ◇ October 2016. ASU Citizen Science-Maker Summit 2016. Workshop hosted by ASU School for the Future of Innovation in Society and SciStarter. Chandler, AZ.
- ◇ May 2016. Qualitative Data Analysis: The Basics. ISSR Workshop at Arizona State University. Tempe, AZ.

- ◇ February 2016. Frontiers in terrestrial climate feedbacks: Integrating models and experiments to explore climate feedbacks in a managed and warming world. INTERFACE Workshop. St. Pete's Beach, FL.
- ◇ January 2016. Central Arizona-Phoenix LTER All Scientists Meeting. Tempe, AZ.
- ◇ November 2015. Ecological function in suburban landscapes. Workshop at the Marine Biological Laboratory, Woods Hole, MA.
- ◇ August 2015. Ecological Society of America Annual Meeting. Baltimore, MD.
- ◇ April 2014. Society for Ecological Restoration New England Chapter Regional Conference. Amherst, MA.
- ◇ April 2013. West Coast Biological Sciences Undergraduate Research Conference. Point Loma, CA.