Shan A. Kothari

Contact Information

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Research Interests

Community assembly, plant ecophysiology, macroecology, remote sensing, climate change

Education

University of Minnesota—Twin Cities, Falcon Heights, MN 2014—2020
Ph.D. student, Plant Biology
Committee: Jeannine Cavender-Bares (advisor), Daniel Stanton, Rebecca Montgomery, Yaniv Brandvain, Phil Townsend (UW-Madison)
Thesis topic: The ecology of photoprotection and photoinhibition in plant communities

Michigan State University, East Lansing, MI 2010—2014
B.S., Zoology, Spec. in Ecology, Evolution, and Organismal Biology
B.S., Anthropology
Minor, Mathematics
3.97/4.0 overall GPA, Honors College

Teaching Experience

Teaching Assistant Spring 2019
PMB 3005W: Plant Function Lab
University of Minnesota
David Marks

Volunteer Teaching Assistant Spring 2016
EEB 4068/5068: Plant Physiological Ecology
University of Minnesota
Jeannine Cavender-Bares

Publications and Manuscripts

Kothari, S. A., Hobbie, S. E., and J. M. Cavender-Bares. Rapid estimates of leaf litter chemistry using reflectance spectroscopy. (in prep, manuscript available upon request)

Schweiger, A. K., Cavender-Bares, J. M., Townsend, P. A., Hobbie, S. E., Madritch, M. D., **Kothari, S. A.**, Grossman, J. J., Gholizadeh, H., Wang, R., and J. A. Gamon. Plant spectral niches reflect species' complementary functional roles. *biorXiv* DOI: 10.1101/2020.04.24.060483 (submitted to *Proceedings of the Royal Society B*)

Kothari, S. A., Montgomery, R. A., and J. M. Cavender-Bares. Physiological responses to light explain facilitation and competition in a tree diversity experiment. *biorXiv* DOI: 10.1101/845701 (submitted to *Journal of Ecology*)

Zarnetske, P. L.*, Gurevitch, J.*, Franklin, J., Groffman, P., Harrison, C., Hellmann, J., Hoffman, F. M., **Kothari, S. A.**, Robock, A., Tilmes, S., Visioni, D., Wu, J., Xia,

L., Yang, C.-E. Potential ecological impacts of climate intervention by reflecting sunlight to cool Earth. (in revision at *PNAS*) (*equal contributors)

Briscoe Runquist, R. D.*, Gorton, A.*, Yoder, J. B.*, Deacon, N. J., Grossman, J. J., **Kothari, S. A.**, Lyons, M., Sheth, S., Tiffin, P., and D. A. Moeller. Context dependence of local adaptation to abiotic and biotic environments: a quantitative and qualitative synthesis. *The American Naturalist* 195 (2020): 412-431. (*equal contributors)

Halpern, C., Antos, J., **Kothari, S. A.**, and A. Olson. Past tree influence and prescribed fire exert strong controls on reassembly of mountain grasslands after tree removal. *Ecological Applications* 29 (2019): e01860.

Cavender-Bares, J., **Kothari, S. A.**, and W. Pearse. Evolutionary Ecology of Communities. *Oxford Bibliographies in Evolutionary Biology* (2018).

Cavender-Bares, J., **Kothari, S. A.**, Meireles, J. E., Hipp, A., Kaproth, M., and P. Manos. The role of diversification in the continental scale community assembly of the American oaks (*Quercus*). *American Journal of Botany* 105 (2018): 565-586.

Wang, R., Gamon, J. A., Schweiger, A. K., Cavender-Bares, J., Townsend, P. A., Zygielbaum, A. I., and **S. A. Kothari**. Influence of species richness, evenness, and composition on spectral diversity: a simulation study. *Remote Sensing of Environment* 211 (2018): 218–228.

Kothari, S. A., Cavender-Bares, J., Bitan, K., Verhoeven, A., Wang, R., Montgomery, R., and J. Gamon. Community-wide consequences of variation in photoprotective physiology among prairie plants. *Photosynthetica* 56 (2018): 455–467.

Kothari, S. A. Characterization of a Family of Cubic Dynamical Systems. *Ball State Undergraduate Mathematics Exchange* (2011), 8(1): 25–36, 201.

Academic Presentations

Kothari, S. A., Cavender-Bares, J., Beauchamp-Rioux., R., and E. Laliberte. *Predicting functional traits from reflectance spectra in fresh, pressed, and ground leaves*. Canadian Airborne Biodiversity Observatory Meeting 2019. Talk. November 2019.

Kothari, S. A.. *Plant Physiological Responses to Solar Geoengineering: Knowns and (Mostly) Unknowns*. UMN Ecosystem Consequences of Solar Geoengineering Symposium. Talk. November 2019.

Kothari, S. A., Montgomery, R., and J. Cavender-Bares. *Throwing shade: Light-mediated facilitation and competition in a tree diversity experiment*. Ecological Society of America 2019. Talk. August 2019.

Kothari, S. A., Montgomery, R., Hobbie, S. E., Reich, P., and J. Cavender-Bares.

The physiological underpinnings of facilitation in a tree diversity experiment. Long-Term Ecological Research All-Scientists Meeting 2018. Poster. October 2018.

Kothari, S. A., Montgomery, R., Hobbie, S. E., Reich, P., and J. Cavender-Bares. *The physiological underpinnings of facilitation in a tree diversity experiment*. Ecological Society of America 2018. Invited talk. August 2018.

Kothari, S. A., Cavender-Bares, J., Bitan, K., Verhoeven, A., Wang, R., Montgomery, R., and J. Gamon. *Community-wide consequences of variation in photoprotective physiology among prairie plants*. Botanical Society of America 2018. Talk. July 2018.

Kothari, S. A. (substitute for J. Cavender-Bares) *Linking remotely sensed spectral diversity to genetic, phylogenetic and functional diversity to predict ecosystem processes*. Ecological Society of America 2017. Ignite talk. August 2017.

Kothari, S. A., Cavender-Bares, J., Schweiger, A. K., Townsend, P. A., Hobbie, S. E., and R. Montgomery. *Nitrogen uptake and crown-level allocation across an experimental tree diversity gradient*. Ecological Society of America 2017. Talk. August 2017.

Kothari, S. A., Cavender-Bares, J., Verhoeven, A., Bitan, K., Wang, R., Montgomery, R., and J. Gamon. *Seasonal variation in xanthophyll cycle pigments among species with contrasting water use strategies*. Ecological Society of America 2016. Talk. August 2016.

Educational Presentations

Kothari, S. A.. *Biodiversity and Ecosystem Function*. University of Minnesota, Dr. Jesus Pinto-Ledezma's Biodiversity Science Class. Guest Lecture. March 2020.

Kothari, S. A.. *Spectral Properties of Leaves and Plants*. University of Minnesota, Dr. Jen Teshera-Levye's Plant Physiological Ecology Class. Guest Lecture. February 2020.

Kothari, S. A.. *How Much Light Does a Plant Need?* Macalester College, Dr. Mary Heskel's Plant Ecophysiology Class. Guest Lecture. November 2019.

Kothari, S. A.. *The Other Darwin*. University of Minnesota Darwin Day. Invited lecture. February 2018.

Kothari, S. A., Pearson, C., Mayfield, K., Zuchora, A., and S. Smith. *Your Brain on Jane Austen*. Michigan State University Science Festival. Demonstration / Seminar. April 2014.

Symposia and Workshops Organized

Ecosystem Consequences of Solar Geoengineering, with Sumil Thakrar. University of Minnesota, 2019. Day-long symposium.

Interactions Between Leaf-Level and Canopy Physiology, with Z. Carter Berry. Ecological Society of America 2018. Organized Oral Session.

Spectral Detection of Plant Stress in a Changing Global Environment, with Jeannine Cavender-Bares. Ecological Society of America 2018. Symposium.

Workshops Attended

- Facilitation and biodiversity-ecosystem function research. ETH Zurich, Zurich, Switzerland. January 2021 (planned).
- Ecological impacts of solar radiation management geoengineering. Port Jefferson, New York. October 2020 (planned).
- RCN: Cross-Scale Processes Impacting Biodiversity. University of Florida, Gainesville, Florida. June 2019.
- RCN: Cross-Scale Processes Impacting Biodiversity. Cedar Creek Ecosystem Science Reserve, University of Minnesota, East Bethel, Minnesota. June 2018.
- PHYS-Fest. Konza Prairie, Kansas State University, Manhattan, Kansas. June 2016.
- Synthesizing Trait Evolution in Plants (sTEP). German Centre for Integrative Biodiversity Research (iDiv), Leipzig, Germany. May 2015.
- Open Tree of Life Hackathon. University of Michigan, Ann Arbor, Michigan. September 2014.

Awards and Funding

- UMN Hamm Award for Outstanding Plant Science Graduate Student 2020
- Fulbright/Swiss Government Excellence Scholarship (declined) 2019
- UMN Doctoral Dissertation Fellowship ($25,000) 2019
- UMN Plant Biological Sciences Travel Grants ($3760) 2015-9
- UMN International Thesis Research Travel Grant ($3300) 2019
- Alexander & Lydia Anderson Grant ($3000) 2019
- Travel Mini-Grant, NSF Cross-Scale Biodiversity RCN ($2000) 2019
- Cedar Creek Graduate Research Fellowships ($6000) 2016-8
- Carolyn Crosby Research Grant ($3000) 2016
- AAAS/Science Program for Excellence in Science 2016
- G. H. Lauff Tuition Scholarship, Kellogg Biological Station ($500) 2014
- National Science Foundation Graduate Research Fellowship ($138,000) 2014
- UMN College of Biological Sciences Excellence Fellowship ($45,000) 2014
- College of Arts and Letters Undergraduate Research Grant ($750) 2013
- Goldwater Scholarship Honorable Mention 2012
- MSU Professorial Assistantship ($4,000) 2010
- MSU Alumni Distinguished Scholarship (full ride) 2010

Mentoring

Britney Millman, Cedar Creek Intern 2018
Project title: Dimming the light: the effects of CO2 on photosynthetic light-use efficiency

Andrew Landsem, Cedar Creek Intern 2018
Project title: Raspberry abundance and soil salinity levels along road edges

Daav Sannerud and Ingrid Holstrom, Cedar Creek Interns 2018
Project title: Interaction between tree productivity and mycorrhizal communities in relation to varying levels of tree diversity

Jacob Becker and Valerie Gehn, Cedar Creek Interns 2017
Project title: Quantifying nitrogen's impact on C3 and C4 grass on the aniso- / isohydric continuum. (co-mentored with Kaitlin Kimmel)

Emily Geary, Cedar Creek Intern 2016
Project title: Mapping migration corridors and land use of Northern Saw-whet owls in Minnesota

Ella Johnson, Cedar Creek Intern 2016-2017
Project title: Changes in the mean and variation of percentage light transmission in relation to relative abundance of needle-leaf and broad-leaf trees in forest ecosystems (co-mentored with Jake Grossman)

Service

- Representative, UMN College of Biological Sciences Graduate Student Board
- Representative, UMN Council of Graduate Students
- Representative, UMN College of Biological Sciences Diversity & Initiatives Committee
- Officer, Phytograds (UMN Plant Biology student association)
- Student Liaison, Physiological Ecology Section, Ecological Society of America
- Organizer, Jackson Middle School Eco-Extravaganza
- Reviewer for *Global Ecology and Biogeography* (5), *Biotropica* (2), *Ecology* (1), *Ecography* (1), *Functional Ecology* (1), *Ecology and Evolution* (1), *AoB PLANTS* (1), *Northwest Science* (1)
- Market Science (2015-20) – led sessions on Plant Chemistry, Remote Sensing, the Biology of Sunscreen, and Counting Nature
- Judge at Minnesota State Science Fair (2015, 2017), Winchell Undergraduate Research Symposium (2015)
- Michigan Science Olympiad volunteer (2011, 2012, 2014)