

MEHA JAIN
School for Environment and Sustainability
University of Michigan
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EMPLOYMENT

- **University of Michigan, Assistant Professor**
School for Environment and Sustainability. September 2016 to present.

EDUCATION

- **Stanford University, Postdoctoral Fellow**
Department of Earth System Science. August 2014 to August 2016.
Advisor: David Lobell
- **Columbia University, Ph.D.**
Department of Ecology, Evolution, and Environmental Biology. September 2008 to July 2014.
Advisors: Ruth DeFries and Shahid Naeem
- **Princeton University, A.B., *cum laude***
Department of Ecology and Evolutionary Biology. September 2003 to May 2007.
Advisor: Daniel Rubenstein

PUBLICATIONS

⁺ denotes shared first authorship

Students I have advised are underlined

In Review/Revision

1. Vandermeer, J., A. Aga, J.E. Allgeier, C. Badgley, R. Baucom, J. Blesh, L. Fink Shapiro, L. Hoey, **M. Jain**, A.D. Jones, I. Perfecto, M.L. Wilson (In Revision). Feeding Prometheus: An Interdisciplinary Approach for Solving the Global Food Crisis. *Frontiers in Sustainable Food Systems*.
2. Liu, T., M.E. Marlier, A.N. Karambelas, **M. Jain**, S. Singh, M.K. Singh, R. Gautam, and R.S. DeFries (In Revision). High resolution estimation of post-monsoon agricultural burned area in northwestern India. *International Journal of Remote Sensing*.
3. Fishman, R., **M. Jain**, A. Kishore (In Revision). When Water Runs Out: Adaptation to Gradual Environmental Change in Indian Agriculture. *Journal of Human Resources*.

Published

1. Urban, D., K. Guan, **M. Jain** (2018). Estimating sowing dates from satellite data over the U.S. Midwest: a comparison of multiple sensors and metrics. *Remote Sensing of Environment*. 211: 400-412.
2. Bhattarai, N., K. Mallick, N. Brunsell, G. Sun, **M. Jain** (2018). Regional-scale evapotranspiration from the Surface Temperature Initiated Closure model across an aridity gradient in the conterminous United States. *Hydrology and Earth System Sciences*. 22: 2311-2341.

* selected as a 'Highlight Article' by the Editorial Board of HESS

3. Azzari, G., **M. Jain**, D.B. Lobell (2017). Towards Fine Resolution Global Maps of Crop Yields: Testing Multiple Methods and Sensors in Three Countries. *Remote Sensing of Environment*. 202:129-141.
4. **Jain, M.**, B. Singh, A. Srivastava, R.K. Malik, A. McDonald, D.B. Lobell (2017). Using Satellite Data to Identify the Causes of and Potential Solutions for Yield Gaps in India's Wheat Belt. *Environmental Research Letters*. 12: 094011.
* selected as a 'Featured Article' by the Editorial Board of ERL
5. D.B. Kramer, J. Hartter, A.E. Boag, **M. Jain**, K.J. Stevens, K.A. Nicholas, W. McConnell, J. Liu (2017). Top 40 Transformative Questions in Coupled Human and Natural Systems (CHANS) Research. *Ecology and Society*. 22(2): 4.
6. **Jain, M.**, P. Mondal, G.L. Galford, G. Fiske, R.S. DeFries (2017). An Automated Approach to Mapping Cropped Area of Smallholder Farms Across Large Scales. *Remote Sensing*. 9:566
7. **Jain, M.**, A. Srivastava, B. Singh, A. McDonald, K. Royal, M.C. Lisaius, D.B. Lobell (2016). Mapping Smallholder Wheat Yields and Sow Dates Using Microsatellite Data. *Remote Sensing* 8(10): 860.
8. Mondal, P., **M. Jain**, M. Zukowski, G. Galford, R.S. DeFries (2016). Quantifying fluctuations in the winter cropped area in the Central Indian Highlands. *Regional Environmental Change* 16: 69-82.
9. Feola, G., A.M. Lerner, **M. Jain**, M.J.F. Montefrio, K.A. Nicholas (2015). Researching Farmer Behavior in Climate Change Adaptation and Sustainable Agriculture: Lessons Learned From Five Case Studies. *Journal of Rural Studies*. 35: 74-84.
10. **Jain, M.**, S. Naeem, B. Orlove, V. Modi, R.S. DeFries (2015). Understanding the Causes and Consequences of Differential Decision-Making in Adaptation Research: Adapting to a Delayed Monsoon Onset in Gujarat, India. *Global Environmental Change*. 31: 98-109.
* selected as one of the top papers in GEC that has advanced the frontiers of adaptation research over the past 10 years
11. Mondal, P., **M. Jain**, R.S. DeFries, G.L. Galford, C. Small (2015). Sensitivity of crop cover to climate variability: Insights from two Indian agro-ecoregions. *Journal of Environmental Management*. 148: 21-30.
12. Mondal, P., **M. Jain**, A.W. Robertson, G.L. Galford, C. Small, R.S. DeFries (2014). Winter crop sensitivity to inter-annual climate variability in central India. *Climatic Change*. 126: 61-76.
13. Wood, S., A. Jina, **M. Jain**, P. Kristjanson, R.S. DeFries (2014). Smallholder farmer cropping decisions related to climate variability across multiple regions. *Global Environmental Change*. 25: 163-172.
* selected as one of the top papers in GEC that has advanced the frontiers of adaptation research over the past 10 years
14. **Jain, M.**, Y. Lim, J.A. Arce-Nazario, M. Uriarte (2014). Perceptual and socio-demographic factors associated with household water treatment in rural Puerto Rico. *PLoS ONE*. 9(2): 1-8.
15. **Jain, M.**, D.F.B. Flynn, C.M. Prager, G.M. Hart, C.M. DeVan, F.S. Ahrestani, M.I. Palmer, D.E. Bunker, J.M.H. Knops, C.F. Jouseau, and S. Naeem (2014). The importance of rare species: A trait based assessment of the potential for rare species to contribute to ecosystem function in tall-grass prairies. *Ecology and Evolution*. 4(1): 104-112.

16. **Jain, M.**, P. Mondal, R.S. DeFries, C. Small, G.L. Galford (2013). Mapping cropping intensity of smallholder farms – a comparison of methods using multiple sensors. *Remote Sensing of Environment*. 134: 210-223.
17. Balvanera, P., M. Uriarte, L. Almeida-Lenero, A. Altesor, F. DeClerck, T. Gardner, J. Hall, A. Lara, P. Larterra, M. Pena-Claros, D.M.S. Matos, L.P. Romero-Duque, A.L. Vogl, L.F. Arreola, A.P. Caro-Borrero, F. Gallego, **M. Jain**, C. Little, R. de Oliveira Xavier, J.M. Paruelo, J.E. Peinado, L. Poorter, N. Ascarrunz, F. Correa, M.B. Cunha-Santino, A.P. Hernandez-Sanchez, M. Vallejos (2012). Ecosystem Services Research in Latin America: The state of the art. *Ecosystem Services*. 2: 56-70.
18. C.B. Yackulic⁺, M. Fagan⁺, **M. Jain**⁺, A. Jina, Y. Lim, M. Marlier, R. Muscarella, P. Adame, R.S. DeFries, M. Uriarte (2011). Biophysical and Socioeconomic Factors Associated with Forest Transitions at Multiple Spatial and Temporal Scales. *Ecology and Society*. 16(3): 15.
19. Odadi, W., **M. Jain**, S. Van Wieren, H.T. Prins, D.I. Rubenstein (2011). Facilitation between bovinds and equids on an African savanna. *Evolutionary Ecology Research*. 13:237-252.
20. Flynn, DFP. N. Mirotchnick, **M. Jain**, M.I. Palmer, S. Naeem (2011). Functional and phylogenetic diversity as predictors of biodiversity-ecosystem-function relationships. *Ecology*. 92(8): 1573-1581.1
21. Forbes, T., V. Goss, **M. Jain**, P.C. Burns (2007). Structure Determination and Infrared Spectroscopy of K(UO₂)(SO₄)(OH)(H₂O) and K(UO₂)(SO₄)(OH). *Inorganic Chemistry*. 26(18):7163-7168

To be Submitted (by Fall 2018)

1. **Jain, M.**, A. Srivastava, B. Singh, P. Rao, J. Blesh, D.B. Lobell. Using high-resolution satellite data to target and measure the impact of sustainable agricultural technologies. Target: *Nature Sustainability*.
2. **Jain, M.**, A. Jina, P. Rao, S. Wood, B. Orlove, S. Naeem, P. West, R.S. DeFries. Adapting Adaptation Research: A Systematic Review of Adaptation Research in the Agricultural Sector. Target: *Frontiers in Ecology and the Environment*.
3. **Jain, M.**, R. Fishman, P. Mondal, G.L. Galford, N. Bhattarai, S. Naeem, U. Lall, R.S. DeFries. Groundwater depletion will reduce cropping intensity in India. Target: *Proceedings of the National Academy of Sciences*.
4. N. Bhattarai, K. Mallick, **M. Jain**. Mapping evapotranspiration of smallholder farms at large scales using an automated approach. Target: *Remote Sensing of Environment*.
5. A. Pollack, D.B. Lobell, **M. Jain**. The impacts of groundwater depletion on cropping decisions and yield in India. Target: *Environmental Research Letters*.
6. S. Singh, A. Jones, **M. Jain**. Agricultural transitions negatively impact farmer nutrition in India. Target: *Global Environmental Change*.

FELLOWSHIPS AND GRANTS

- **NASA** (\$751,707). Land-Cover and Land-Use Change (LCLUC) Program. May 2017 to 2020.
PI: **M. Jain**. Co-PIs: D. Lobell, R. Fishman. Collaborators: A. Chhatre, B. Singh.
- **NASA** (\$262,612). New Investigator Program (NIP) in Earth Science Grant. September 2016 – 2019.

- PI: **M. Jain**. Collaborators: D. Lobell, R. Fishman, A. Chhatre, B. Singh.
- **National Science Foundation** Sustainability Postdoctoral Fellowship (SEES; \$487,020). August 2014 –2018.
PI: **M. Jain**. Mentors: D. Lobell, R. Fishman.
 - **Google Earth Engine Research Award** (\$62,867). Summer 2014-2015.
PIs: G. Galford, R.S. DeFries. Co-PIs: **M. Jain**, G. Fiske, P. Mondal
 - **National Science Foundation** Doctoral Dissertation Improvement Grant (DDIG; \$14,488). Spring 2013 to Fall 2015.
 - **CHANS (Coupled Human and Natural Systems) Fellow** (\$1000). NSF CHANS-Net 2012.
 - **National Science Foundation** Graduate Research Fellowship (NSF GRF; \$150,000). Fall 2009 to 2012.
 - **National Geographic** Young Explorers Grant (\$5,000). Fall 2011
 - **Advanced Consortium on Cooperation, Conflict, and Complexity** Fellow (\$3,000). Fall 2011
 - **NASA** Land Cover and Land Use Change Grant (\$751,000) Summer 2011 to 2014.
PIs: R.S. DeFries, C. Small, G. Galford; Collaborator: M. Lal, **M. Jain**
 - **Compton Foundation** Mentor Fellowship (\$36,000). Fall 2007 to 2008.
 - **Becky Colvin Fund**, Undergraduate Thesis Research (\$2,500). Summer 2006

TEACHING AND ADVISING EXPERIENCE

- Natural Resource Statistics (EAS 538) – Core Graduate-level Introductory Statistics and R Programming Class. Nominated for the ‘Outstanding Teacher’ award by students for every year of teaching (2017, 2018).
- Global Environmental Change and Sustainable Food Systems (EAS 639) – Graduate Seminar on the impacts of global environmental change on food systems and potential sustainable intensification strategies.
- Currently advising 2 postdocs, 4 M.A. students, and 2 undergraduate students in independent research projects at the University of Michigan. Committee member for 2 Ph.D. students (Jonathan Sullivan, University of Michigan and Elizabeth Tellman, Arizona State University). Previously have advised 3 undergraduate students.

PROFESSIONAL SERVICE AND SKILLS

- **Skills:** Software: Fluent in R, ENVI, Google Earth Engine, ArcGIS, QGIS, Amazon Cluster Computing, Google Cloud Computing, and APSIM Crop Modeling. Versed in Python, IDL, and NetLogo. Languages: Fluent - Hindi, Conversational - Gujarati, French.
- **Reviewer:** Science Advances, Proceedings of the National Academy of Sciences, Global Change Biology, Ecology Letters, Geophysical Research Letters, Remote Sensing of Environment, Remote Sensing, Global Environmental Change, Ecology and Society, Journal of Development Economics, International Journal of Remote Sensing, Regional Environmental Change, Human Ecology
- **Member:** American Geophysical Union (AGU), American Association of Geographers (AAG)

SELECT PRESENTATIONS AND WORKSHOPS

- **NASA Land Cover Land Use Change Conference** (Rockville & Gaithersburg, MD). Oral Presentation (Invited, 2018); Attendee (2017); Poster (2012, 2013).
- **Workshop on Linking Ecosystem Services & Earth Observations** (Minneapolis, MN & Stanford, CA). Attendee (Invited). NASA funded workshop led by the Natural Capital Project to identify how ecosystem services can be mapped using earth observations.
- **American Geophysical Union** (San Francisco, CA & New Orleans, LA). Oral Presentation (Invited 2013, 2017); Poster Presentation (2012, 2014, 2015).
- **Earth Science Young Leader** (New Orleans, LA). Selected to participate in meeting with the NASA Science Mission Directorate Associate Administrator about how NASA can best promote early career faculty.
- **Association of Environmental and Resource Economists** (Pittsburgh, PA). Oral Presentation (Invited, 2017). Invited to give presentation to economists about the benefits of using remote sensing data for research on land cover and land use change.
- **NASA South/Southeast Asian Research Initiative** (New Delhi, India). Oral Presentation (Invited 2017). Invited to participate in workshop between NASA-funded scientists and Indian government about mapping Indian agriculture.
- **Google Earth Engine Summit** (Mountain View, CA). Attendee (2017, 2016). Oral Presentation (Invited 2015).
- **American Association of Geographers** (Multiple Locations). Oral Presentation (Invited 2017; 2012)
- **National Socio-Economic Synthesis Center Workshop** (SESYNC; Annapolis, MD). Observing Rural Development from Space. Attendee (Invited). Workshop on how to use satellite data to map rural development in Mozambique.
- **Toward Sustainable Groundwater in Agriculture** (San Francisco, CA). Oral Presentation (2016).
- **Conference on Global Food Security** (Ithaca, NY). Oral Presentation (2015).
- **Global Land Project** (Berlin, Germany). Oral Presentation (2014).
- **Governance of Adaptation Symposium** (Amsterdam, Netherlands). Oral Presentation (2012).

SELECT PUBLISHED DATA PRODUCTS, REPORTS, AND NEWS ARTICLES

- **Jain, M.,** P. Mondal, G. L. Galford, G. Fiske, and R. S. DeFries. 2017. India Annual Winter Cropped Area, 2001-2016. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC). <https://doi.org/10.7927/H47D2S3W>.
- News story on our recent work about closing wheat yield gaps in northern India (2017). <https://www.scidev.net/asia-pacific/agriculture/news/sowing-wheat-india.html>
- Jain Lab Research featured in Smithsonian Magazine (2017). <http://www.smithsonianmag.com/innovation/how-daily-images-entire-earth-will-change-way-we-look-it-180962467/>
- **Jain, M.** (2013). Indian Farmers Cope with Climate Change and Falling Water Tables. Water Currents. *National Geographic News Watch*.
- Naeem, S., P. Olmsted, J. Sircely, **M. Jain**, S. Smukler, C. Ingram (2010). Ecosystem services: A Primer for Biodiversity Conservation. Natural Resources Management and Development Portal. USAID.