

Curriculum Vitae – Pinki Mondal

DR. PINKI MONDAL

The Center for International Earth Science Information Network (CIESIN)
Earth Institute, Columbia University
61 Route 9W, Palisades, NY 10964, USA
Email: pm2658@columbia.edu; Web: pink-mondal.weebly.com

Summary

Research Interests: Agricultural response to weather variability, diet and nutrition, human-environment interaction, impact of climate change on vulnerable population, applied geospatial analysis.

Teaching Experience: Physical geography; Remote sensing; Landscape analysis; Regional geography

Funding: Current or completed projects funded by: Lamont Climate Center, Indo-US Science and Technology Forum, Google Earth Engine, and USDA Forest Service
(Total amount \$167,922)

Publications: 12 articles (11 published, 1 in review), 1 guest editorial for a special section, 2 edited book chapters, 3 reports

Technical and Software Skills: ArcGIS, ENVI, ERDAS Imagine, IDRISI, Dinamica EGO, FRAGSTATS, SPIP, R, SPSS, NCSS.

Employment

Columbia University, New York (Sep 2015 – Current)

Senior Research Associate; Center for International Earth Science Information Network (CIESIN), Earth Institute

Adjunct Lecturer (Jan – May 2016); Department of Ecology, Evolution and Environmental Biology

City University of New York – City College, New York (Aug 2015 – Current)

Adjunct Professor; Spitzer School of Architecture

Columbia University, New York (Jan 2012 – Aug 2015)

Postdoctoral Research Scientist; Department of Ecology, Evolution and Environmental Biology; *Mentor:* Dr. Ruth DeFries

University of Massachusetts – Amherst, Massachusetts (2011)

Postdoctoral Research Associate; Department of Environmental Conservation, Family Forest Research Center (FFRC); *Mentors:* Dr. Brett Butler, Dr. Dave Kittredge

University of Florida, Florida (2006 – 2011)

Graduate Fellow, Research and Teaching Assistant; Department of Geography

Education

University of Florida, Florida (2006 – 2011)

Ph.D. in Geography; Concentration: Land Change Science; Minor: Research Design and Methods in Conservation

Curriculum Vitae – Pinki Mondal

Jadavpur University, India (2002 – 2004)
M.Sc. in Applied Geology

University of Calcutta, India (1999 – 2002)
B.Sc. in Geology (Honors); Minor: Chemistry and Mathematics

Research

Implications of Agricultural Intensification for Diet and Nutrition in Rural India (2015-present)

Leading an inter-disciplinary project on food and nutrition security in smallholder farmer families in central India; collaborating with researchers from multiple academic institutions including Columbia's Earth Institute, Columbia University Medical Center, Foundation for Ecological Security (Indian NGO) and Johns Hopkins University; data collection is currently in progress.

Assessing agricultural adaptation strategies for reducing winter crop sensitivity to future climate variability in central India (2014- present)

Leading an interdisciplinary crop-climate modeling project; collaborating with researchers from multiple institutions including New York University, Indian Institute of Soil Science, and Foundation for Ecological Security (Indian NGO); obtained funding from the Lamont Climate Center; data collection is currently in progress.

Agricultural sensitivity, climate variability, and future food security in South Asia (2012-present)

Integrating climate data and socio-economic data with satellite-derived crop cover maps to examine spatial patterns of smallholder vulnerability to climate variability; collaborating with researchers from multiple academic institutions including University of Vermont, Lamont Doherty Earth Observatory, International Research Institute for Climate and Society, and Stanford University; published/submitted results in peer-reviewed journals.

Earth Institute projects: Developed global Urban Heat Island (UHI) and Land Surface Temperature (LST) data products by compiling and analyzing MODIS satellite data; analyzed global species richness data for 2015 ESI biodiversity indicators.

Spatial characteristics of forest and forest ownership attributes across urban-rural gradients of the United States (2011-2012)

Analyzed Forest Inventory and Analysis (FIA) data, National Woodland Owner Survey (NWOS) data, National Land Cover Database (NLCD), Environment Protection Agency (EPA) housing density data (current and projected for next 50 years) as a project member on USFS Northern Forest Futures Project; mapped thermal signatures of land uses across urban-rural gradients using satellite-derived thermal data products; collaborated with USFS Remote Sensing Application Center (RSAC) and multiple USFS research stations; published results in peer-reviewed journal.

Using Remote Sensing to Measure Protected Area Effectiveness in a Tropical Landscape (2006-2010)

Designed and conducted study; analyzed multi-sensor satellite images; collaborated with government officials and NGOs in India; obtained funding for field-trip; organized field-trip and worked with local stakeholders; collected ground-truth data; prepared report for

Curriculum Vitae – Pinki Mondal

government agency; presented results for funding agency and in national meetings; published results in peer-reviewed journals.

A global-level study estimating the risk of rising sea level to global population in low elevation coastal zones (2010)

Analyzed LandScan and GRUMP population data along with global-level elevation data in ArcGIS; quantified the risk of rising sea-level to the global population; estimated uncertainty in using different population datasets; published results in peer-reviewed journal.

An ethno-ecological study on bird-species in Yucatan, Mexico (2007)

Worked in an inter-disciplinary setting; helped with questionnaire-based survey and collecting data on birds; collected training samples for remote sensing analysis; pre-processed satellite images; presented research for collaborators and funding agency; contributed in writing the findings.

Land use/land cover analyses of Sundarbans using remote sensing techniques: a case study in Jharkhali island (2003-2004)

Analyzed and interpreted satellite data to examine land-cover/land-use changes in a vulnerable estuarine system; presented results in seminars.

Publications

DeFries, R., Fanzo, J., **Mondal, P.**, Remans, R., Wood, S. Is voluntary certification of tropical agricultural commodities achieving sustainability goals?: A review of the evidence. *Environmental Research Letters*. In Review.

DeFries, R., **Mondal, P.**, Singh, D., Agrawal, I., Fanzo, J., Remans, R., Wood, S. 2016. Synergies and Trade-offs for Sustainable Agriculture: Nutritional Yields and Climate-Resilience for Cereal Crops in Central India. *Global Food Security*. doi: 10.1016/j.gfs.2016.07.001.

Mondal, P., Jain, M., Zukowski, M., Galford, G., DeFries, R. 2016. Quantifying fluctuations in winter cropped area in the Central Indian Highland landscape. *Regional Environmental Change* 16, 69-82.

Mondal, P., Nagendra, H., DeFries, R. 2016. Addressing issues of climate change impacts, adaptation and vulnerability on the ground: Challenges and opportunities. *Current Science* 110 (7), 1193-1194.

Mondal, P., Jain, M., DeFries, R., Galford, G., Small, C. 2015. Sensitivity of crop cover to climate variability: Insights from two Indian agro-ecoregions. *Journal of Environmental Management* 148, 21-30.

Mondal, P., Jain, M., Robertson, A., Galford, G., Small, C., DeFries, R. 2014. Winter crop sensitivity to inter-annual climate variability in central India. *Climatic Change* 126, 61-76.

Housman, I., **Mondal, P.**, Hamilton, R., Fisk, H., Lister, A., Butler, B., Jacobs, D., Lister, T., Salajanu, D. 2013. Percent impervious landcover modeling: Analyzing the impacts of model types, calibration methods, and ecoregions. RSAC-10025-RPT1. Salt Lake City, UT: U.S. Department of Agriculture, Forest Service, Remote Sensing Applications Center. 13 p.

Curriculum Vitae – Pinki Mondal

- Jain, M., **Mondal, P.**, DeFries, R., Small, C., Galford, G. 2013. Mapping cropping intensity of smallholder farms: a comparison of methods using multiple sensors. *Remote Sensing of Environment* 134, 210-223.
- Mondal, P.**, Butler, B., Kittredge, D., Moser, W. 2013. How are America's private forests changing? An integrated assessment of forest management, housing pressure, and urban development in alternate emissions scenarios. *Land Use Policy* 32, 230-238.
- Mondal, P.**, Tatem, A. 2012. Uncertainties in measuring populations potentially impacted by sea level rise and coastal flooding. *PLoS One* 7 (10): e48191.
doi:10.1371/journal.pone.0048191
- Mondal, P.**, Nagendra, H. 2012. Parks and Preserves. In Joel Campbell, Jingjing Liu, & Sony Pellissery (Eds.), *The Encyclopedia of Sustainability*, Vol. 7: *China, India, and East and Southeast Asia: Assessing Sustainability*. Great Barrington, MA: Berkshire Publishing.
- Nagendra, H., **Mondal, P.**, Adhikari, S., Southworth, J. 2012. Peopled parks: Forest change in India's protected landscapes. In E. S. Brondizio and E. F. Moran (Eds.), *Human-Environment Interactions: current and future directions*, Springer.
- Mondal, P.**, Nagendra, H. 2011. Trends of forest dynamics in tiger landscapes across Asia. *Environmental Management* 48 (4), 781-794.
- Mondal, P.** 2011. Quantifying surface gradients with a 2-band Enhanced Vegetation Index (EVI2). *Ecological Indicators* 11 (3), 918-924.
- Mondal, P.**, Southworth, J. 2010. Evaluation of conservation interventions using a cellular automata-Markov model. *Forest Ecology and Management* 260 (10), 1716-1725.
- Mondal, P.**, Southworth, J. 2010. Protection vs. Commercial management: spatial and temporal analysis of land cover changes in the tropical forests of Central India. *Forest Ecology and Management* 259 (5), 1009 -1017.
- Mondal, P.** 2010. 30 Years of Protection: A Success Story. In: Jha, M. and Joshi, C. 2010. Pench, Maharashtra: The Big Tale of a Small Tiger Reserve, Technical Book No. 3, Pench Tiger Reserve, India and Center for Environment Education, India.
- Mondal, P.** 2004. Land use/land cover analysis of Sundarbans using remote sensing techniques: A case study in Jharkhali Island (*Master's thesis*).

Manuscripts in preparation:

- Jain, M., Fishman, R., **Mondal, P.**, Galford, G., Naeem, S., Modi, V., DeFries, R. Irrigation as an Adaptation Strategy to Climate Change: The Relative Influence of Groundwater and Canal Irrigation on Winter Crop Production and its Sensitivity to Weather Variability in India. In Prep for *Nature Climate Change* (to be submitted in Fall 2016)

Teaching

Columbia University

Introduction to Landscape Analysis (Upper level undergraduate/Graduate lecture + lab course)

- Independent instructor, co-taught with R. DeFries
 - Spring 2016 – Enrollment: 13

Curriculum Vitae – Pinki Mondal

Global Assessment and Monitoring Using Remote Sensing (Upper level undergraduate/Graduate lecture + lab course)

- Guest lecture – Fall 2013

City College of New York

Physical Geography (Graduate lecture + lab course)

- Independent instructor, co-taught with M. Tantala
 - Fall 2015 – Enrollment: 18
 - Fall 2016 – Enrollment: 15

University of Florida

Physical Geography (Undergraduate lecture course designed and taught by the instructor)

- Independent instructor
 - Fall 2008 – Enrollment: 129
 - Spring 2008 – Enrollment: 62
 - Fall 2007 – Enrollment: 113

Remote Sensing (Upper level undergraduate/Graduate lecture + lab course)

- Guest lecture – Fall 2010
- Lab manual designer – Fall 2010

Regional Geography (Undergraduate lecture course)

- Guest lecture – Fall 2010

Research Grants

NSF Geography and Spatial Sciences Program (\$397,121 – PI): Submitted

Indo-US Science and Technology Forum (~\$62,000 – US PI): Submitted

NASA Land Cover and Land Use Program (\$691,309 – PI; \$750,004 – co-I): Submitted

Google Earth Engine Research Award for “The sensitivity of agricultural output to climate variability across smallholder farms in South Asia” (\$62,867 – Project collaborator)

Lamont Climate Center sponsored project for FY2014-2016 on “Assessing agricultural adaptation strategies for reducing winter crop sensitivity to future climate variability in central India” (\$9,850 – co-PI)

Indo-US Science and Technology Forum (~\$16,000 – US PI): Indo-US Bilateral Workshop on “Adaptation of rural communities to climate change: Bridging the gap between academia and community workers and identifying research needs”, Feb 2014

USDA Forest Service (Remote Sensing Steering Committee) sponsored project for FY2012 (\$79,205 – Co-I): Oct 2011 – Sep 2012

Awards and Honors

Sponsored Student Travel Award, US Regional Association of the International Association for Landscape Ecology

NSF “On the Cutting Edge” Professional Development Workshop Stipend

NASA-MSU Professional Enhancement Award, US Regional Association of the International Association for Landscape Ecology

Curriculum Vitae – Pinki Mondal

Best Paper Award, University of Florida Graduate Student Council Interdisciplinary Research Conference

CLAS Graduate Travel Award, University of Florida

Ryan Poehling Fellowship, University of Florida

Graduate Student Council Travel Grant (2009, 2008), University of Florida

Imagery Grant, GeoEye Foundation, Virginia

Best Poster Award, University of Florida Graduate Student Council Interdisciplinary Research Conference

Office of Graduate Research and Program Travel Grant, University of Florida

Tropical Conservation and Development Field Research Grant, University of Florida

Alumni Fellowship, University of Florida

Certificate of merit under National Scholarship Scheme (2002, 1997), Government of India

Published Abstracts and Presentations

Mondal, P., Jain, M., Galford, G., DeFries, R. Quantifying the spatial and temporal vulnerability of agricultural systems to weather variability in India. *Global Land Project Open Science Meeting* (Accepted), Beijing, China. Oral Presentation.

Mondal, P., Jain, M., Zukowski, M., Galford, G., DeFries, R. Quantifying fluctuations in winter productive cropped area in the central Indian highlands. *Pre-IGU International Conference on Land Use and Rural Sustainability*. 17-20 August 2016, Xi'an, China. Oral Presentation (invited).

Mondal, P., Jain, M., Galford, G., DeFries, R. Coupled Effects of Climatic and Socio-economic Factors on Winter Cropping in India. *American Geophysical Union Fall Meeting*. 14-18 December 2015, San Francisco, California. Poster Presentation.

Mondal, P., Jain, M., Robertson, A., Galford, G., Small, C., DeFries, R. Decoupling the spatial and temporal vulnerability of agricultural systems to future climate changes. *AsiaFlux Workshop 2015 and ISPRD TC WG VIII/3: Weather, Atmosphere and Climate Studies Joint Conference*. 22-29 November 2015, Pune, India. Oral Presentation (invited).

Mondal, P., Jain, M., Galford, G., DeFries, R. Quantifying winter crop sensitivity to climate variability across agro-ecological zones in India. *International Conference on Global Food Security*. 11-14 October 2015, Ithaca, New York. Oral Presentation.

Jain, M., Fishman, R., **Mondal, P.**, Galford, G., Naeem, S., Modi, V., DeFries, R. Irrigation as an Adaptation Strategy to Climate Change: The Relative Influence of Groundwater and Canal Irrigation on Winter Crop Production and its Sensitivity to Weather Variability in India. *American Geophysical Union Fall Meeting*. 15-19 December 2014, San Francisco, California. Poster Presentation.

DeFries, R., **Mondal, P.**, Jain, M., and Galford, G., Climate Sensitivity of Cropping Intensity in India. *NASA Synthesis Workshop on Land Use and Land Cover Dynamics in South and Southeast Asia*. 3-4 November 2014, Kathmandu, Nepal. Oral Presentation.

Curriculum Vitae – Pinki Mondal

- Mondal, P.**, Jain, M., DeFries, R., Galford, G., Small, C. Climate sensitivity of smallholder farmers across multiple agro-ecological zones in India. *Global Land Project Open Science Meeting*. 19-21 March 2014, Berlin, Germany. Oral Presentation.
- Mondal, P.**, Jain, M., DeFries, R., Galford, G., Small, C. Sensitivity of crop cover to inter-annual climate variability: Insights from two Indian agro-ecoregions. *IUSSTF Indo-US bilateral workshop*. 20-21 February 2014, Bengaluru, India. Oral Presentation.
- Mondal, P.**, Jain, M., Robertson, A., Galford, G., Small, C., DeFries, R. Winter crop sensitivity to inter-annual climate variability in central India. *Kanha-Pench Landscape Symposium*. 16-18 February 2014, Mocha, India. Oral Presentation.
- Mondal, P.**, Jain, M., DeFries, R., Galford, G., Small, C. Impacts of Changing Climate on Agricultural Variability: Implications for Smallholder Farmers in India. *American Geophysical Union Fall Meeting*. 9-13 December 2013, San Francisco, California. Poster Presentation.
- Mondal, P.**, Jain, M., DeFries, R., Galford, G., Small, C. Agricultural susceptibility to climate variability: Insight from two Indian agro-ecoregions. *NASA Land-Cover and Land-Use Change Science Team Meeting*. 2-4 April 2013, Rockville, Maryland. Poster Presentation.
- Jain, M., Small, C., **Mondal, P.**, Galford, G., DeFries, R. Mapping Cropped Area of Smallholder Farms in South Asia. *NASA Land-Cover and Land-Use Change Science Team Meeting*. 2-4 April 2013, Rockville, Maryland. Poster Presentation.
- DeFries, R., **Mondal, P.**, Jain, M., Small, C., and Galford, G. Multi-sensor Fusion to Determine Agricultural Sensitivity to Climate Variability in South Asia. *NASA Science Team Meeting*. January 2013, Coimbatore, India. Oral Presentation.
- Mondal, P.**, DeFries, R., Jain, M., Robertson, A., Galford, G., Small, C. 2012. A multi-sensor approach to identify crop sensitivity related to climate variability in Central India. *American Geophysical Union Fall Meeting*. 3-7 December 2012, San Francisco, California. Poster Presentation.
- Jain, M., **Mondal, P.**, Small, C., Galford, G., DeFries, R. 2012. Mapping cropping intensity of smallholder farms in South Asia: A comparison of MODIS, Landsat, and mixture model techniques. *NASA Land-Cover and Land-Use Change Science Team Meeting*. 3-5 April 2012, Rockville, Maryland. Poster Presentation.
- Mondal, P.**, Butler, B. and Kittredge, D. 2012. Impact of climate and land use change: How are America's private forests changing? *The Association of American Geographers Annual Meeting*. 24-28 February 2012, New York. Oral Presentation.
- Mondal, P.**, Southworth, J. and Fik, T. 2011. Comparison of ASTER-derived vegetation indices and surface temperature in detecting forest successions. *US Regional Association of the International Association for Landscape Ecology Symposium*. 3-7 April 2011, Portland, Oregon. Oral Presentation.
- Mondal, P.** and Southworth, J. 2010. Exploring the utility of ASTER thermal bands in measuring protected area effectiveness. *The Association of American Geographers Annual Meeting*. 14-18 April 2010, Washington DC. Oral Presentation.
- Mondal, P.** 2010. Enhanced Vegetation Index as a fragmentation indicator. *US Regional Association of the International Association for Landscape Ecology Symposium*. 4-8 April 2010, Athens, Georgia. Oral Presentation.

Curriculum Vitae – Pinki Mondal

- Mondal, P.** 2010. Using CA-Markov model to investigate the importance of national level policy in forest conservation. *UF Graduate Student Council Interdisciplinary Research Conference*. 3 February 2010, Gainesville, Florida. Oral Presentation.
- Mondal, P.** and Southworth, J. 2010. Using CA-Markov model to investigate the importance of national level policy in forest conservation. *Florida Society of Geographers Annual Meeting*. 15-17 January 2010, Tampa, FL. Oral Presentation.
- Mondal, P.** and Southworth, J. 2009. The role of government policies in protected area management: A case study from Central India. *South Eastern Division of the Association of American Geographers Annual Meeting*. 22-24 November 2009, Knoxville, Tennessee. Oral Presentation.
- Mondal, P.** 2009. 30 Years of Protection: Examining a Park's Performance in Decreasing Forest Fragmentation in Central India. *US Regional Association of the International Association for Landscape Ecology Symposium*. 12-16 April 2009, Snowbird, Utah. Poster Presentation.
- Mondal, P.** 2009. Identifying forest cover change in and around Pench Tiger Reserve, India. *The Association of American Geographers Annual Meeting*. 22-27 March 2009, Las Vegas, Nevada. Poster Presentation.
- Mondal, P.** 2009. 30 years of protection: is Pench Tiger Reserve a success story? *UF Graduate Student Council Interdisciplinary Research Conference*. 12 February 2009, Gainesville, Florida. Poster Presentation.

Invited Seminars

- Agricultural sensitivity to inter-annual climate variability: Implications for smallholder farmers in India, San Francisco State University, January 2014
- Agricultural sensitivity to inter-annual climate variability: Implications for smallholder farmers in India, Oklahoma State University, November 2013
- Parks and Policies: Integrating geospatial tools and modeling to evaluate conservation interventions in Central India, University of Colorado, Colorado Springs, November 2010

Workshops and Professional Training

- Adaptation of rural communities to climate change: Bridging the gap between academia and community workers and identifying research needs. *Indo-US bilateral workshop*. 20 – 21 February 2014, Bengaluru, India.
- Dinamica: Landscape Dynamics Modeling. *University of Vermont*. 20 – 23 August 2013, Burlington, Vermont.
- GIS Tools for Analyzing Dynamic Landscapes. *US Regional Association of the International Association for Landscape Ecology Symposium*. 3 April 2011, Portland, Oregon.
- NSF “*On the Cutting Edge: Preparing for an Academic Career in the Geosciences*” Workshop. 29 July – 1 August 2010, Stanford University, California.
- Land Surface Phenology. *US Regional Association of the International Association for Landscape Ecology Symposium*. 5 April 2010, Athens, Georgia.

Curriculum Vitae – Pinki Mondal

What is Landscape Ecology up to in the Climate Change Debate? *US Regional Association of the International Association for Landscape Ecology Symposium*. 14 April 2009, Snowbird, Utah.

Airborne GPS and Inertia in Support of Triangulation and Orientation of Airborne Framing and Push broom Sensors. *American Society for Photogrammetry and Remote Sensing Annual Conference*. 8 May 2007, Tampa, Florida.

DOEACC A-level professional training in computer applications including programming, problem solving and data structure through C, database management systems, basics of OS, UNIX and Shell programming, object oriented programming and C++ (training equivalent to Post Graduate Diploma in Computer Application), Kolkata, India.

Field Experience

Exploratory dietary survey for potential future projects in central India (2015)

Exploratory social survey and remote sensing ground truthing for post-doc project in Madhya Pradesh, India (2012-13), and for PhD project in Maharashtra, India (2008)

Ecological survey and questionnaire-based social survey in Yucatan, Mexico (2008)

Geological survey in structurally complex zones in Jharkhand, India (2003), and in Maharashtra, India (2001)

Service Activities

Panel reviewer, NASA NESSF-Carbon Cycle and Ecosystems (2016)

Organizing committee member, Central Indian Landscape Symposium (2016)

Guest co-Editor: *Current Science* (Special Section on *Livelihood impacts and adaptation of rural communities to climate change in India*, 2016)

PI and co-organizer, Indo-US bilateral workshop (2014)

Organizing committee member, Kanha-Pench Landscape Symposium (2014)

Panel reviewer, NASA Terrestrial Ecology (2013)

Session convener, American Geophysical Union (AGU) fall meeting (2013)

Graduate Representative, UF Geography (2009-2010)

Liaison person between Geography and UF Graduate Student Council (2009-2010)

Co-organizer, new student orientation events and departmental participation in several national meetings (2009-2010)

Volunteer, Florida Museum of Natural History Fossil Hunt (2006)

Journal reviewer: *Forest Ecology and Management*; *Remote Sensing*; *Landscape and Urban Planning*; *Ecological Complexity*; *Environmental Management*; *Land Use Policy*; *International Journal of Remote Sensing*; *ISPRS Journal of Photogrammetry and Remote Sensing*; *Landscape Ecology*; *Climatic Change*; *Journal of Land Use Science*; *Society & Natural Resources*, *PLoS One*.

Professional Membership

Association of American Geographers (since 2008)

United States Regional Association of the International Association for Landscape Ecology (since 2008)

Curriculum Vitae – Pinki Mondal

CHANS-Net: International Network of Research on Coupled Human and Natural Systems (since 2011)

American Geophysical Union (since 2012)