

Dev Niyogi

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Purdue University

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EDUCATION

Ph.D. Atmospheric Sciences, North Carolina State University, Dissertation on ***Biosphere Atmosphere Interactions coupled with CO₂ and Soil Moisture Changes***, Fall 2000.

M.S. Atmospheric Sciences, North Carolina State University, Thesis on ***Dynamic Interactions in Soil Vegetation Atmosphere Transfer Processes***, Fall 1996.

B.Engg. Civil Engineering, Univ. of Poona, India, Report on: ***Development, Validation, and Implementation of an Air Quality Model for an Industrial Area***, Fall 1994.

RESEARCH AND TEACHING INTERESTS

Research focus is on representing and detecting the effect of land surface processes including the effects of vegetation – atmosphere interactions on micro-, regional- and large scale terrestrial hydrological and earth system processes.

Involves both field observations and modeling analysis, for process studies, hypothesis – driven experimentation, and applications.

Current research projects are in following areas: Land Surface Processes, Terrestrial Hydrological Processes, Biospheric Processes in Weather and Regional Climate Models, Remote and Land based Observational Systems, Land Use Land Cover Change, Non Greenhouse Gas based Climate Change Detection and Attribution, Agricultural Air and Water Quality, High Performance Computing for Water Cycle – Climate Interactions and Cyberinfrastructure.

Publications (Peer Reviewed): Published or Accepted: 77 In Review: 18
(pdf versions of all papers/manuscripts available at <http://landsurface.org>)

Conference preprints: Preprints / extended abstracts : 159

EXPERIENCE:

02/05 – onwards Assistant Professor and Indiana State Climatologist, Department of Agronomy and Department of Earth and Atmospheric Science, Purdue University

01/01 – 02/05 Research Assistant Professor, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University

01/02 - 06/ 02 Acting State Climatologist and Director of State Climate Office of North Carolina, North Carolina State University

01/01 – 03/03 Associate State Climatologist for North Carolina (NC ECO Net), State Climate Office of North Carolina, North Carolina State University

02/98 – 12/00 Assistant State Climatologist (AgNet), State Climate Office of North Carolina, Department of Marine, Earth and Atmospheric Sciences, and Meteorologist, and Department of Horticulture Science, North Carolina State University

08/94 – 01/98 Graduate Research Assistant, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University

05/94 – 07/94 First Rajeev Gandhi Summer Fellow for Atmospheric Sciences, Jawaharlal Nehru Center for Advanced Scientific Research, Indian Institute of Sciences

05/92 – 05/94 Junior Research Fellow, Inter Agency Project through United Nations Environmental Programs, Indian Institute of Technology – Bombay.

Current Adjunct Appointments

2004 – 2007 Adjunct Assistant Professor, Department of Atmospheric Sciences, Colorado State University

2003 – 2007 Adjunct Assistant Professor, Department of Geography, Univ. of North Carolina at Chapel Hill

2005 – Adjunct Assistant Professor, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University.

Citations in biographical works

Marquis Who's Who In America 2006 Edition

PROFESSIONAL HONORS AND AFFILIATIONS:

- Review Editor, Climate Research Journal 2006 –
- Associate Editor, American Meteorological Society- Journal of Applied Meteorology and Climatology 2008 -
- Guest Editor – International Journal of Climatology Special issue on Detecting Land Use Impacts on Weather and Climate, 2008 – 2009 (reviews underway).
- Guest Editor – Global Planetary Change Special issue on land use land cover change biogeochemical feedbacks at multiple scales, 2007 – 2008 (in print).
- Outstanding Service plaque for first Agricultural Air Quality workshop – Presented by Colien Hefferan, CSREES administrator at the first workshop on agricultural air quality, Maryland, June 8, 2006.
- Invited Participant/ Presenter, NRC Board on Agriculture and Natural Resources, Gates Foundation Workshop on Animal Health, Soil, Water, & Energy, November 2007.
- Invited US Delegate, Speaker, and Session Chair, Indo-US Workshop on High Performance Computing in Weather and Climate through Indo – US Forum on Science and Technology, June 2005, Boulder, CO.
- Invited Delegate and Speaker, Joint Chinese Institute of Urban Meteorology – National Center for Atmospheric Research Workshop on Urban Observation and Modeling, Beijing, China, October 11 – 13, 2004.
- NASA Press release 'Tiny Air Particles Change How Much Carbon Plants Absorb' (Dec, 04)

- Chair, Outstanding Student Presentation Awards (Biogeochemistry), American Geophysical Union (AGU) Boston, MA, 2001, Washington DC 2002, San Francisco 2004, 2005
- Invited Member, AASC / NOAA Climate Reference Network Working Group (1999 – 2001)
- Invited Member, AMS Committee on Agriculture and Forest Meteorology 1999 – 2002
- Invited Member, AMS Committee on Applied Climatology 2002 - 2006
- Invited Member, Federal Geophysical Data Committee, Spatial Climate Group (2000 – 2005)
- Invited Speaker, Department of Physics, Jadavpur University, Kolkata, India, December 12, 2003.
- Invited US Delegate, Speaker, and Session Chair, Session Chair, International Conference on Air Quality Management, Brunei Darussalam, November 1999
- 1999 Global Climate Change Travel Fellowship through American Meteorological Society
- UCAR / NSF Summer Research Fellow for National Center for Atmospheric Research Advanced Study Program on Terrestrial Ecosystem and Atmosphere, 1996
- National Center for Technological Development Cash Award for Environmental Innovations, Bombay, India, 1994
- National Engineering Design Award by Indian Society for Technical Education, 1989
- Member, American Meteorological Society, Since 1998
- Member, American Association of State Climatologist, since 1998
- Member, American Geophysical Union, Since 1999
- Reviewer for Journals of Applied Meteorology, Geophysical Research Letters, Atmospheric Environment, Journal of Geophysical Research, Meteorology and Applied Physics, Bulletin of American Meteorological Society, Pure and Applied Geophysics, J of Hydrometeorology, Int. J. of Climatology, Water Resources Research, Water and Soils, J. Earth System Sciences, Atmospheric Chemistry and Physics Discussions, and Science.
- Reviewer for Grant Proposals through NSF Climate and Large Scale Dynamics, NSF Mesoscale Dynamics, NSF Biocomplexity, NSF Hydrology, NSF Atmospheric Chemistry, U.S. EPA, NASA (Land use land cover change, Radiation Science, as well as Hydrology), NSF ITR, Army Research Lab, Panel member for DOE National Institute for Climate Change Research (NICCR).

TEACHING AND RELATED EXPERIENCE:

- Weather and Climate (undergraduate, for agricultural and arts/humanities majors, approx 30 students per class, Spring 06, 07).
- Land Surface Modeling (graduate course at Purdue, enrollment 5, Fall 06, Fall 07).
- Meteorological Instrumentation (Spring 02, 03, 04; Class size 15, course cross listed for undergraduate and graduate students at NC State)
- Global Climate Change (Fall 2004, NC State) (Class size: 40 students, undergraduates)
- Developed AMS Short Course on Model Evaluation and Statistics (joint with AMS Applied Climate and AMS Statistics committees), AMS Annual Meeting 2004.
- Assisted in designing and working with term projects and giving guest lectures for Micrometeorology (Fall 1998, Fall 2000), and Planetary Boundary Layer (Fall 1999, Fall

2001); Guest Lectures to Global Environmental Problems class (Fall 1999, Fall 2000); Aerosol class (7 lectures, Fall 2002)

- Various community, extension lectures, presentations for community groups, training workshops, various professional presentations and seminars to a wide variety of audience ranging from town hall meetings to science panel meetings.
- Two NSF Geoscience Education grants (one on Meteorological Instrumentation, second on Climate Change Education Modules).

PUBLICATIONS

Invited Book Chapters (Peer Reviewed)

- BC1. Niyogi D., Raman S., 2001, Numerical modeling of gas deposition and bi-directional surface – atmosphere exchanges in mesoscale air pollution systems, in Mesoscale Dispersion Modeling, Ed. Z. Boybeyi, WIT Publications, Southampton, UK p.424.
- BC2. Niyogi D., R. A. Pielke Sr., K. Alapaty, J. Eastman, T. Holt, U. C. Mohanty, S. Raman, T. K. Roy, Y. K. Xue, 2002, Challenges of representing land surface processes in weather and climate models over Tropics: Examples over the Indian subcontinent, in Weather and Climate Modeling, S.V. Singh, Swati Basu & T.N.Krishnamurti (Eds.), New Age International (P) Ltd. Publishers, New Delhi, pp. 132-145.
- BC3. Pielke, R.A. Sr., J. Adegoke, A. Beltran-Przekurat, C.A. Hiemstra, J. Lin, U.S. Nair, D. Niyogi, and T.E. Nobis, 2006: Impacts of regional land use and land cover on rainfall - An overview. IAHS Red Book - Proc. 5th FRIEND World Conference, Water Resource Variability: Processes, Analyses and Impacts, Havana, Cuba. IAHS Publ. 308.
- BC4. Pielke R. A., Sr. and D. Niyogi, The Role of Landscape Processes within the Climate System, Invited Book Chapter in review for Proceedings of Landform Symposium held at Bonn (Editor: Jan-Christoph Otto), Springer Publishers.
- BC5. Rochon G., D. Niyogi, Alok Chaturvedi, Rajarathinam Arangarasan, Krishna Madhavan, Larry Biehl, Joseph Quansah and Souleymane Fall, 2008, Adopting Multisensor Remote Sensing Datasets and Coupled Models for Disaster Management, in Remote Sensing and GIS Technologies for monitoring and Prediction of Disasters, Springer Berlin Heidelberg, DOI:10.1007/978-3-540-79259-8, ISBN: 978-3-540-79258-1 (Print) 978-3-540-79259-8 (Online)p. 75-99

Refereed Journal Publications: (Manuscripts/ published copies available at <http://landsurface.org>) [†]indicates graduate student, ^{††}indicates undergraduate student.

1. In Press (Page proofs/ final versions of accepted papers available at <http://landsurface.org>)

77. Chang H., A. Kumar, D. Niyogi, U. C. Mohanty, F. Chen, and J. Dudhia, 2008, The Role of Land Surface Processes on the Mesoscale Simulation of the July 26, 2005 Heavy Rain Event over Mumbai, India Global Planetary Change, accepted.

76. Niyogi D., K. Alapaty, S. Raman, F. Chen, 2008: Development and Evaluation of a Coupled Photosynthesis-Based Gas Exchange Evapotranspiration Model (GEM) for Mesoscale Weather Forecasting Applications, *J. Appl. Meteorol. Clim.*, accepted July 27, 2008.
75. Govindaraju, R.S., B. Engel, D. Ebert, B. Fossum, M. Huber, C. Jafvert, S. Kumar, V. Merwade, D. Niyogi, L. Oliver, S. Prabhakar, G. Rochon, C. Song, L. Zhao, 2008: A vision of cyberinfrastructure for end-to-end environmental explorations (C4E4), *ASCE Journal of Hydrologic Engineering*, accepted March 2008.
74. LeMone M.A., Mukul Tewari, Fei Chen, Joseph G. Alfieri and Dev Niyogi, 2008, Adding Horizontal Heterogeneity as a Criterion for Evaluating a Land-Surface Model, *Mon. Wea. Rev.*, accepted January 2008.
73. Douglas E. M.*, A. Beltrán-Przekurat*, D. S. Niyogi*, R.A. Pielke, Sr., and C. J. Vörösmarty, 2007, The Impact of Agricultural Intensification and Irrigation on Land-Atmosphere Interactions and Indian Monsoon Precipitation - A Mesoscale Modeling Perspective, *Global Planetary Change*, accepted December 2007.
72. Vinod Kumar, A. Chandrasekar, D. Niyogi, and K. Alapaty, 2006, Impact of Land Surface Representation and Surface Data Assimilation on the Simulation of an Off-Shore Trough over the Arabian Sea, *Global Planetary Changes*, accepted December 2007.
71. Alfieri J.G. †, Xiangming Xiao*, D. Niyogi*, R.A. Pielke Sr., Fei Chen, M. A. LeMone, 2007: Satellite-based modeling of transpiration and evaporation of grasslands and croplands in the Southern Great Plain, USA, *Global Planetary Changes*, accepted December 2007.

In Print / Published:

2008

70. Kumar A., J. Dudhia, R. Rotunno, D. Niyogi, and U.C. Mohanty, 2008, Analysis of the July 26, 2005 heavy rain event over Mumbai, India using the Weather Research and Forecasting (WRF) model, *Quart. J. Roy. Met. Soc.*, 134, 1897 - 1910.
69. Alfieri, J.G., D. Niyogi, P.D. Blanken, F. Chen, M.A. LeMone, K.E. Mitchell, M.B. Ek, and A. Kumar, 2008, Estimation of the Minimum Canopy Resistance for Croplands and Grasslands Using Data from the 2002 International H2O Project. *Mon. Wea. Rev.*, 136, 4452-4469.
68. Alapaty K., D. Niyogi, F. Chen, P. Pyle, A. Chandrasekar, N. Seaman, 2008, Development of the Flux-Adjusting Surface Data Assimilation System for Mesoscale Models, *J. Appl. Meteorol. Clim.*, 47, 2331 - 2350.
67. Occhipinti, C, V.P. Aneja, W. Showers, and D. Niyogi, 2008, Back-Trajectory Analysis and Source-Receptor Relationships: Particulate Matter and Nitrogen Isotopic Composition in Rainwater, *Journal of the Air & Waste Management Association*, 58, 1215-1222.
66. Xavier V. F., A. Chandrasekar, H. Rahman, D. Niyogi, K. Alapaty, 2008, The Effect of Assimilation of Satellite and Conventional Meteorological Data for the Prediction of a Monsoon

Depression over India using a Mesoscale Model, *Meteorology and Atmospheric Physics*, 10.1007/s00703-008-0314-7

65. Matsui, T., A. Beltrán-Przekurat, D. Niyogi, R.A. Pielke Sr., and M. Coughenour, 2008: Aerosol light scattering effect on terrestrial plant productivity and energy fluxes over the eastern United States. *J. Geophys. Res.* – Yoram J. Kaufman Symposium Issue, 113, D14S14, doi:10.1029/2007JD009658
64. Vinod Kumar, A. Chandrasekar, K. Alapaty, and D. Niyogi 2008, The impact of indirect soil moisture assimilation and direct surface temperature and humidity assimilation on a mesoscale model simulation of an Indian monsoon depression, *Journal of Applied Meteorology and Climatology*, 47, 1393 - 1412. DOI: 10.1175/2007JAMC1599.1
63. M. Lei*, D. Niyogi, C. Kishtawal, R. Pielke Sr., A. Beltrán-Przekurat, T. Nobis, and S. Vaidya, 2008, Effect of explicit urban land surface representation on the simulation of the 26 July 2005 heavy rain event over Mumbai, India, *Atmos. Chem. Phys.*, 8, 5975 - 5995.
62. Aneja, V.P., J. Blunden, P. A. Roelle, W. H. Schlesinger, R. Knighton, W. Gilliam, D. Niyogi, G. Jennings, and C. Duke, 2008, Workshop on Agricultural Air Quality: State of the Science, *Atmospheric Environment*, 42, 3195-3208 doi:10.1016/j.atmosenv.2007.07.043
61. Aneja V., J. Blunden, K. James, W.H. Schlesinger, R. Knighton, W. Gilliam, D. Niyogi, S. Cole, 2008, Ammonia Assessment from Agriculture: US Status and National Needs, *J. Environmental Quality*, 37, 515 - 520. DOI: 10.2134/jeq2007.0002in

2007

60. Pielke Sr., R.A., C. Davey, D. Niyogi, S. Fall† J. Steinweg-Woods††, K. Hubbard, X. Lin, M. Cai, Y.-K. Lim, H. Li, J. Nielsen-Gammon, K. Gallo, R. Hale, J. Angel, R. Mahmood, S. Foster, R.T. McNider, and P. Blanken, 2007: Unresolved issues with the assessment of multi-decadal global land surface temperature trends. *J. Geophys. Research*, 112, D24S08, doi:10.1029/2006JD008229.
59. Alfieri J.†, D. S. Niyogi, M. A. LeMone, F. Chen, and S. Fall†, 2007: A Simple Reclassification Method for Correcting Uncertainty in Land Use/Land Cover Datasets Used with Land Surface Models, *Pure and Applied Geophysics (Invited)*, 164, 1789 - 1809. DOI 10.1007/a00024-007-0241-4.
58. Roy, S.S., R. Mahmood, D. Niyogi, M. Lei†, S.A. Foster, K.G. Hubbard, E. Douglas, and R.A. Pielke Sr., 2007: Impacts of the agricultural green revolution induced land use changes on air temperatures in India. *J. Geophys. Res.*, 112, D21108, doi:10.1029/2007JD008834.
57. Houston, A., and D. Niyogi, 2007, The Sensitivity of Convective Initiation to the Lapse Rate of the Active Cloud-Bearing Layer, *Mon. Wea. Rev.* 135, 3013-3032. DOI:10.1175/MWR3449.1.
56. Chen F., K. W. Manning, M. A. LeMone, S. B. Trier, J. G. Alfieri, R. Roberts, M. Tewari, D. Niyogi, T. W. Horst, S. P. Oncley, J. B. Basara, and P. D. Blanken, 2007: Description and Evaluation of the Characteristics of the NCAR High-Resolution Land Data Assimilation

- System, *Journal of Applied Meteorology and Climatology* , 46, 694–713, DOI: 10.1175/JAM2463.1
55. Vinodkumar, A. Chandrasekar, K. Alapaty and D. Niyogi, 2007, The effect of a surface data assimilation technique and the traditional four-dimensional data assimilation for the prediction of a monsoon depression over India using a mesoscale model, *Natural Hazards*, DOI 10.1007/s11069-006-9080-3.
54. Pielke Sr., R.A, J. Nielsen-Gammon, C. Davey, J. Angel, O. Bliss, N. Doesken, M. Cai, S. Fall†, D. Niyogi, K. Gallo, R. Hale, K.G. Hubbard, X. Lin, H. Li, and S. Raman, 2007, Documentation of uncertainties and bias associated with surface temperature measurement sites for climate change assessment studies. *Bull. Amer. Meteorol. Soc.*, 88, 913 - 928.
53. Pielke Sr., R.A., D. Stokowski, J.-W. Wang, T. Vukicevic, G. Leoncini, T. Matsui, C. Castro, D. Niyogi, C.M. Kishtawal, A. Biazar, K. Doty, R.T. McNider, U. Nair, and W.K. Tao, 2007, Satellite-based model parameterization of diabatic heating. *Eos – Proceedings of the American Geophysical Union*, 88, 96 - 97 (20 February 2007).
52. Matsui, T., A. Beltran-Przekurat, R. A. Pielke, Sr., D. Niyogi, and M. B. Coughenour, 2007, Continental-scale multiobservation calibration and assessment of Colorado State University Unified Land Model by application of Moderate Resolution Imaging Spectroradiometer (MODIS) surface albedo, *J. Geophys. Res.*, 112, G02028, doi: 10.1029/2006JG000229.
51. Pielke, R.A. Sr., J. Adegoke, A. Beltran-Przekurat, C.A. Hiemstra, J. Lin, U.S. Nair, D. Niyogi, and T.E. Nobis, 2007, An overview of regional land use and land cover impacts on rainfall. *Tellus B*, 59B, 587-601.
50. Dev Niyogi, Hsin-I Chang†, Fei Chen, Lianhong Gu, Anil Kumar, Surabi Menon, Roger A. Pielke Sr., 2007, Potential Impacts of Aerosol-Land-Atmosphere Interaction on the Indian Monsoonal Rainfall Characteristics, *Natural Hazards- Monsoon Special Issue*, DOI - 10.1007/s11069-006-9085-y (Invited Paper)
49. Fall S. †, D. Niyogi, U. C. Mohanty, and A. Kumar, 2007, Application of Weather Prediction Models for Hazard Mitigation Planning - A case study of Heavy off-season rains in Senegal, *Natural Hazards*. DOI 10.1007/s11069-006-9033-x, URL <http://dx.doi.org/10.1007/s11069-006-9033-x>.
48. LeMone. M.A., F. Chen, J.G. Alfieri†, R.H. Cuenca, Y. Hagimoto, P. Blanken, D. Niyogi, S. Kand, K. Davis, and R. Grossman, 2007, NCAR/CU surface, soil, and vegetation observations during the International H2O Project 2002 field campaign. *Bulletin of American Meteorological Society*, 88, 65 - 81
47. Pielke R. A. Sr., J.O. Adegoke, T.N. Chase, C. H. Marshall, T. Matsui, D. Niyogi, 2007, A New Paradigm for Assessing the Role of Agriculture in the Climate System and in Climate Change, *Agric. For. Meteorol.*, Special Issue, 132, 234 - 254. (Invited Paper)

46. V.P. Aneja, W. Schlesinger, D. Niyogi, G. Jennings, W. Gilliam, R. Knighton, C. Duke, J. Blunden, S. Krishnan, 2006, Emerging National Research Needs for Agricultural Air Quality, *Eos - Transactions American Geophysical Union*, 87, 25 - 29.
45. Niyogi*, D., T. Holt*, S. Zhong, P. C. Pyle†, and J. Basara, 2006, Urban and land surface effects on the 30 July 2003 mesoscale convective system event observed in the Southern Great Plains, *J. Geophys. Res.*, 111, D19107, doi: 10.1029/2005JD006746.
44. Alpert P.*, Niyogi D.*, Pielke R.A. Sr.*, Eastman J.L., Xue Y.K., Raman S., 2006, Evidence for Carbon Dioxide and Moisture Synergies from the Leaf Cell up to Global scales: Implications to Human-Caused Climate Change, Special Issue: Land-use/land-cover change and its impact on climate, 202-208
43. Palmieri†, R., Tredway L., Niyogi D., Lackmann G., 2006, Development and Evaluation of a Forecasting System for Fungal Disease in Turfgrass, *Meteorological Applications*, 13, 1–12 doi:10.1017/S1350482706002428
42. Childs P., A. Qureshi†, S. Raman, K. Alapaty, R. Ellis, R. Boyles, D. Niyogi, 2006, Simulation of Convective Initiation during IHOP_2002 Using the Flux-Adjusting Surface Data Assimilation System (FASDAS), *Monthly Weather Review*, 134, 134 – 148.
41. Fall S.†, Niyogi D. , Semazzi F., 2006, Analysis of Mean Climate Conditions in Senegal (1971–98) , *Earth Interactions*, 10, Paper 5, 1-40.
40. Mera R.J. †, D. Niyogi, G.S. Buol, G. G. Wilkerson, F. Semazzi, 2006, Potential Individual Versus Simultaneous Climate Change Effects on Soybean (C3) and Maize (C4) Crops: An Agrotechnology Model Based Study, *Global and Planetary Change*, 54, Special Issue: Land-use/land-cover change and its impact on climate, 163 - 182.
39. Douglas E.*, D. Niyogi*, S. Froking, J.B. Yeluripati, R. A. Pielke Sr., N. Niyogi, C. J. Vörösmarty, U.C. Mohanty, 2006, Changes in moisture and energy fluxes due to agricultural land use and irrigation in the Indian Monsoon belt, *Geophysical Research Letters*, 33, L14403, doi:10.1029/2006GL026550
38. Aneja* V., D. Niyogi* , P. Roelle*, 2006, An integrated perspective on assessing agricultural air quality, *Intrnl. J. of Global Environmental Issues*,6, 137 - 148. (Invited Paper)
37. Holder C. ††, R. Boyles, Amenulla Syed, D. Niyogi, and S. Raman, 2006, Comparison of co-located automated (NCECONet) and Manual (coop) climate observations in North Carolina, *Journal of Atmospheric and Oceanic Technology*, 23, 671 - 682.
36. Dev Niyogi and Y-K Xue, 2006, Soil moisture regulates the biological response of elevated atmospheric CO2 concentrations in a coupled atmosphere biosphere model, *Global and Planetary Change*, 54, Special Issue: Land-use/land-cover change and its impact on climate, 94-108.
35. Fall S. †, Semazzi F., Niyogi D. , Anyah R., Bowden J., 2006, The spatiotemporal climate variability over Senegal and its relationship to global climate, *International J. Climatology*, 26, 2057-2076.

34. Niyogi D., K. Alapaty, S. Phillips, V. Aneja, 2006. Considering ecological formulations for estimating deposition velocity in air quality models, *Intrnl. J. of Global Environmental Issues*, 6, 270 - 284. (Invited Paper)
33. Holt T., D. Niyogi , F. Chen, M. A. LeMone, K. Manning, A. L. Qureshi†, 2006, Effect of Land - Atmosphere Interactions on the IHOP 24-25 May 2002 Convection Case, *Monthly Weather Review*, 134, 113 – 133.

The following papers below were published while I was at North Carolina State University (graduate student 1994-2000 and Research Assistant Professor 2001- 2004)

32. YingChun Wang, J. Li, Fei Chen, Jianyi Chen, Xuejiao Deng, Weimei Jiang, Kaihon Lau, Donald Lenschow, Dev Niyogi, Jielun Sun, Guoan Ting, Dui Wu, Xiande Xu, Chaolin Zhang, Xiaolin Zhang, MingYu Zhou, 2005, Challenges and Opportunities in Urban Meteorology Research and Forecast, *Science Foundation in China - Bulletin of National Natural Science Foundation*,13, 13 - 20.
31. Matsui T. †, S. Kreidenweis, R. A. Pielke Sr., B. Schichtel, H.B. Yu, M. Chin, A. Chu, D. Niyogi , 2004, Regional comparison and assimilation of GOCART and MODIS aerosol optical depth across the eastern U.S., *Geophysical Research Letters*, 31, L21101, doi:10.1029/2004GL021017.
30. Niyogi D., H. Chang†, V. K. Saxena, T .Holt, K. Alapaty, F. Booker, F. Chen, K.J. Davis, B. Holben, T. Matsui†, T. Meyers, W.C. Oechel, R. A. Pielke Sr., R. Wells, K. Wilson, Y.K. Xue, 2004, Direct observations of the Effects of Aerosol loading on Net Ecosystem CO2 Exchanges over Different Landscapes, *Geophysical Research Letters*, 31, L20506, doi:10.1029/2004GL020915.
29. Gilliam R. † , Raman S., Niyogi D. , 2004, Observational and numerical study on the Influence of Large- Scale Flow Direction and Coastline shape on Sea - Breeze Evolution, *Boundary-Layer Meteorology*,111, 275 – 300, doi: 10.1023/ B:BOUN.0000016494.99539.5a.
28. Niyogi D. , Alapaty K., Raman S., 2003, A Photosynthesis-based dry deposition modeling approach, *Water, Air, and Soil Pollution*, 144, 171 – 194.
27. Pielke R. A. Sr.* , D. S. Niyogi* , T. N. Chase, J. Eastman, 2003, A new perspective on climate change and variability: A focus on India, Invited paper to the *Advanced in Atmospheric and Oceanic Sciences*, *Proc. Indian National Science Academy*, 69, 107 – 123. (Invited Paper)
26. Marland G., R. A. Pielke Sr., M. Apps, R. Avissar, R. A. Betts, K.J. Davis, P.C. Frumhoff, S.T. Jackson, L. Joyce, P. Kauppi, J., Katzenberger, K.G. MacDicken, R. Neilson, J. O. Niles, D. S. Niyogi , R. J. Norby, N. Pena, N. Sampson, Y. Xue, 2003, The climatic impacts of land surface change and carbon management, and the implications for climate -change mitigation policy, *Climate Policy*, 3, 149 – 157, doi:10.1016/S1469-3062(03)00028-7.
25. Yadav A., Raman S., Niyogi D., 2003, A note on estimation of eddy diffusivity and dissipation length in low winds over a tropical urban terrain, *Pure and Applied Geophysics*, 160 , 395 - 404.

24. Rhome J. †, Niyogi D., Raman S., 2003, Assessing seasonal transport and deposition of agricultural emissions in eastern North Carolina, USA, *Pure and Applied Geophysics*, 160 , 117 – 141.
23. Childs P. †, Niyogi D., Raman S., Sims A †. Simpson M., 2002, Land surface parameterization effects in inland tropical storm simulations, *Bull. Amer. Meteorol. Soc.*, 83 , 664 - 665. (Invited commentary)
22. Raman S.* , Niyogi D. * , Simpson M., Pelon J. 2002, Dynamics of the elevated land plume over the Arabian Sea and the northern Indian Ocean during northeasterly monsoon (INDOEX) , *Geophysical Research Letter*, 29, 641 – 644.
21. Pielke Sr., R.A., G. Marland, R.A. Betts, T.N. Chase, J.L. Eastman, J.O. Niles, D. Niyogi, and S. Running, 2002, The influence of land-use change and landscape dynamics on the climate system: relevance to climate change policy beyond the radiative effect of greenhouse gases. *Phil. Trans. Royal Soc. (London) A. Special Theme Issue*, 360 , 1705-1719.
20. Sims † A., Niyogi D. , Raman S., 2002, Adopting Drought Indices for Estimating Soil Moisture: A North Carolina case study, *Geophysical Research Letters*, 29 , 241 – 244.
19. Niyogi D. , Xue Y-K., Raman S., 2002, Hydrological Land Surface Response in a Tropical Regime and a Midlatitudinal Regime, *Journal of hydrometeorology*, 3, 39-56
18. Alapaty K., Seaman N., Niyogi D., Hanna A., 2001, Assimilating Surface Data to Improve the Accuracy of Atmospheric Boundary Layer Simulations, *Journal of Applied Meteorology*, 40, 2068-2082.
17. Satyanarayana A., Mohanty U., Niyogi D. , Raman S., Warrior H., Nelson S., 2001, A Study of Marine Boundary layer processes in the ITCZ and non – ITCZ regimes over Indian Ocean with INDOEX IFP-99 data, *Current Science (INDOEX Special Issue)*, 80 , 39 – 45.
16. Roswintiarti O., Raman S., Mohanty U., Niyogi D. , 2001, Application of a three dimensional triple nested mesoscale model for assessing the transport and the boundary layer variability over the Indian Ocean during INDOEX, *Current Science (INDOEX Special Issue)*, 80 , 69 – 76.
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2. Alapaty K., Pleim J., Raman S., Niyogi D. , Byun D., 1997, Simulation of Atmospheric Boundary Layer Processes using Local – and Nonlocal-Closure Schemes Journal of Applied Meteorology., 36 , 214 - 233.
1. Niyogi D., Patil R.S., 1994, Metrose: A Modified Windrose for Air Quality Management, Atmospheric Environment, 28, 1715-1717. (published while I was an undergraduate)

3. In Review/ revision

1. Shepardson D., D. Niyogi, S. Choi*, and U. Charusombat*, 2008: Seventh Grade Students' Conceptions of Global Warming and Climate Change, Environmental Education Research, submitted.
2. Vinodkumar, A. Chandrasekar, K. Alapaty, and D. Niyogi, 2008: Assessment of data assimilation approaches for the simulation of a monsoon depression over the Indian monsoon region, Boundary-Layer Meteorology, submitted.

3. Montandon* L., S. Fall*, R. A. Pielke Sr, and D. Niyogi, 2008: Mean surface temperature trends are significantly affected by land cover bias in the Global Historical Climatology Network, *Internat.J. Climatology*, submitted.
4. Mishra*, V., K.A. Cherkauer, D. Niyogi, M. Lei*, B. C. Pijanowski, D.K. Ray, and L. C. Bowling, 2008: A Regional Scale Assessment of Land use/land cover and Climatic Changes on Surface Hydrologic Processes, *Internat. J. Climatology*, submitted.
5. Medina, S., R. A. Houze, Jr., A. Kumar, and D. Niyogi, 2008: Summer Monsoon Convection in the Himalayan Region: Terrain and Land Cover Effects, *Quart. J. Roy. Meteorol.*, submitted.
6. Alfieri, J.G., D. Niyogi, H. Zhang, M. A. LeMone, F. Chen, 2008, Quantifying the Spatial Variability of Airborne Surface Flux Measurements Using Data from the 2002 International H2O Project: Using the Surface Energy Budget, *Boundary Layer Meteorology*, in review.
7. Alfieri, J.G., D. Niyogi, H. Zhang, M. A. LeMone, F. Chen, 2008, Quantifying the Spatial Variability of Airborne Surface Flux Measurements Using Data from the 2002 International H2O Project: Statistical Method, *Boundary Layer Meteorology*, in review.
8. Chang H., D. Niyogi, A. Kumar, C. Kishtawal, J. Dudhia, F. Chen, U.C. Mohanty, M. Sheperd, 2008, Possible relation between land surface feedback and the post-landfall structure of monsoon depression, *GRL*, in review.
9. Kumar A., F. Chen, D. Niyogi, J. Alfieri*, K. Mitchell, M. Ek, 2008, Evaluation of a photosynthesis-based canopy resistance formulation in the Noah land surface model, *J. Hydromet.*, submitted.
10. Mahmood, R., R. A. Pielke Sr., K. Hubbard, D.Niyogi, G. Bonan, P. Lawrence, B. Baker, R. McNider, C. McAlpine, A. Etter, S. Gameda, B. Qian, A. Carleton, A. Beltran-Przekurat, T. Chase, A. Quintanar, J. O. Adegoke, S. Vezhapparambu, G. Conner, S. Asefi, E. Sertel, D. R. Legates, Y. Wu, R. Hale, O. N. Frauenfeld, A. Watts, M. Shepherd, C. Mitra, V. G. Anantharaj, S. Souleymane Fall*, R. Lund, A. Nordfelt, P. Blanken, J. Du, Hsin-I Chang*, R. Leeper, U. S. Nair, S. Dobler, R. Deo, J. Syktus, 2008, Impacts of Land Use Land Cover Change on Climate and Future Research Priorities, *Bull. Amer. Meteorol. Soc.*, submitted.
11. Gilbert Rochon, Dev Niyogi, Souleymane Fall, Joseph Quansah, Larry Biehl, Bereket Araya, Chetan Maringanti, Angel Torres Valcarcel , Lova Rakotomalala, Hildred Rochon, and Bertin Mbongo , 2008, Best Management Practices (BMPs) for Corporate, Academic and Governmental Transfer of Sustainable Technologies to Developing Countries, *Clean Technologies and Environmental Policies*, in revision.
12. Choi* S., D. Niyogi, D. P. Shepardson, and U. Charusombat*, 2008, Do Earth and Environmental Science Textbooks Promote Middle and High school Students' Conceptual Development about Climate Change? : Textbooks' consideration of students' conceptions, *Bull. Amer. Meteorol. Soc.* In revision.
13. Shepardson, D., D. Niyogi, S. Choi*, U. Charusombat*, 2008, Student conceptions about global warming and climate change, *Climatic Change*, in review.

14. Niyogi, D., C.M. Kishtawal, S. Tripathi, R. S. Govindaraju, 2008, Is Agricultural Intensification and Land Use Change Reducing the Indian Summer Monsoon Rainfall?, *Wat. Resour. Res.*, in revision.
15. Routray, A. U.C. Mohanty, D. Niyogi, S.R.H. Rizvi, K. Osuri, 2008, First application of the 3DVAR - WRF data assimilation system for mesoscale simulation of heavy rainfall events over the Indian monsoon region, *Meteorol. Atmos. Phys.*, submitted.
16. Fall* S., D. Niyogi, R. A. Pielke Sr., A. Gluhovsky, E. Kalnay, 2007, Impacts of Land Surface Properties on Temperature Trends Using North American Regional Reanalysis Over the USA, *Int. J. of Climatology*, in revision.
17. Pyle* P., D. Niyogi, S. P. Arya, M. Shepherd, F. Chen, B. Wolfe**, 2008, Do Urban Areas Modify Thunderstorms? - An Observational Storm Climatology and Model Case Study for the Indianapolis Urban Region, *J. Appl. Meteorol. and Clim.*, revision in review.
18. Kishtawal C., D. Niyogi, M. Tewari, R. A. Pielke Sr., M. Shepherd, 2007, Heavy Rainfall During Indian Summer Monsoon: A Clear Urban Bias, *Geophys. Res. Lett.*, in revision.

Abstract and Nonreferred Presentations/Proceedings

Over 157 preprints, seminars, and proceedings for professional meetings such as AMS Annual meeting, AGU Fall and Spring meetings, and Conferences. A list is available on request and also at <http://landsurface.org>.

Research grants

Funded through National Science Foundation (Atmospheric Sciences), NSF Cyber Infrastructure, Office of Naval Research/ Naval Research Lab, UCAR/ NSF (International Programs), Division of Air Quality, Center for Turf Education and Research, Faculty Research and Professional Development Award, NASA (Radiation Science), NASA (Terrestrial Hydrology), NASA (Interdisciplinary Sciences), USDA NRICGP (Agricultural Air Quality), USDA NRI CGP (Water Resources), NOAA/EPA.

Active Grants

1. Integrated Climate Change Assessment using Landuse Landcover change, Radiation, and Carbon-Water Cycle, NASA Interdisciplinary Science, (coPI, with R. Pielke CSU as PI); 600K \$160K (Purdue subcontract share). Ends 2009 (may require no-cost extension since 07 funds delayed by over 8 months).
2. Estimation of Evapotranspiration and Crop Water Stress Over Large Areas Using Remote Sensing Observations, USDA NRI CGP, coPI, PI; S. Islam (Tufts Univ.); T. Carlson (coPI, Penn State), 2005 – 2008, \$75K Purdue share,
3. National Workshop on Agricultural Air Quality – USDA NRI CGP, Lead NCSU (collaborating: Duke University W. Schlesinger, Ecological Society of America: Cliff Duke), subcontract to Purdue 01/05 – 12/ 08 for \$37K.
4. Center for Environment – Internal Competition Award 2006 – Preliminary Study on Mapping Aerosols Using Remote Sensed Datasets (PI, coPIs: M. Crawford, L. Biehl, G. Rochon, Harshvardhan), 01/07 – 07/08, 30K (no indirect cost)

5. Multisensor/multiscale assessment of urban impacts in the Great Lakes region, NASA LCLUC coPI (with L. Bowling, K Cherkauer, and B. Pijanowski), 2006 – 08, \$450K
6. Developing Activities for Conceptualizing Climate and Climate Change, NSF – Geoscience Education, \$150K, (co-PI, PI: Dan Shepardson).
- 7: Cyberinfrastructure for end-to-end environmental explorations, NSF – Cyber Infrastructure, \$500K, 8/06 – 7/09, 1mo (co-PI, PI: B. Engel)
8. From Sources to Sinks - A Novel Isotopic Analysis of Nitrate Loading in Groundwater and Surface Runoff in Indiana Watersheds, Showalter Foundation Grant (coPI with G. Michalski, PI, and B. Joern), 68K, 9/2006 – 5/2008
9. Improved Representation of vegetation and land surface for operational Noah – WRF modeling system, Jt. NOAA/DoD/NASA/EPA Center for Satellite Data Assimilation, 450K, 12/06 – 12/09, awarded. (coPI with Fei Chen, NCAR; K. Mitchell NCEP Collaborator; Purdue Share 170K)

Also involved as a coPI for following project at NCSU, Characterization and Fate of Ammonia and Hydrogen Sulfide from Animal Feeding Operations: Their Emissions, Transport, Transformations, Deposition, and Impact on Fine Particulate Matter, USDA- Air Quality Initiative, V. Aneja (PI), co-PI, along with S.P. Arya, G. Jennings, J. Fountain, W. Gilliam, R. Mathur, W. Showers, P. Westerman, \$480K ACTIVE.

Proposals Pending:

Typically one proposal every 2 months. Currently proposals are in review with NSF Office of Cyberinfrastructure (2), NASA Ecology, NASA Terrestrial Hydrology Program.

Projects Completed

1. Impact of Transpiration Feedback on Land Atmosphere Water Vapor Exchange and Land Surface Memory, NOAA, PI (coPI Fei Chen, NCAR), 310K, THROUGH NASA/GWEC-Terrestrial Hydrology Program. Ends 2/2008.
2. Investigation of effect of land surface processes on QPF and convection initiation, NSF – ATM Mesoscale, (2003- 2008, PI) \$400,000 (32K Purdue subcontract share, former PI).
3. Modeling aerosol effects in Numerical Models for Regional Climate Studies, NASA-Radiation Program (2003 – 2007), co-PI; PI- R. Pielke, M. Coughener, S. Kodrenawlis, all CSU; and W. Tao, NASA/GSFC), \$450K (50K Purdue subcontract share)
4. Discovery Park Center for Environment – Lilly Endowment, Agricultural Air Quality, 2005-07, \$25K (no indirect cost)
5. Development and Operation of NC Agricultural Weather and Climate Observational Network (AgNet), NC Agricultural Research Services, 1999 – 2002 (Project Manager and co-Principal Investigator), 1998 – 2003. 50K/yr.
6. Surface – Atmosphere Exchanges for Hydrometeorological Models, NOAA / EPA, 1999 2002 35K.
7. Emergency Management Assistance in North Carolina (co- Investigator and Project Manager), NC Dept. Emergency Management, 2000-2001. 45K.
8. Analysis of Land Plume over Indian Ocean during INDOEX, (Collaborator), NSF Div. Atmos. Sci., 2000 – 2003. (coauthored the proposal).

9. NCAR- Travel Support for Participation in International H2O Project (IHOP) Field Program and Land Surface Workshop, (through RAP and MMM NCAR; P. LeMone) 5K.
10. Field Component of the Instrumentation Meteorology Course, NCSU- ETF, 2001-2002, 10K
11. Participation in the Environmental Monitoring at the World Trade Center Site (Project Manager) EPA contract to State Climate Office, 2002
12. Biophysical Measurements and Data Analysis using Porometry and Canopy scaling, 2003, NCSU-ETF 10K.
13. Coupling and Validating Noah Land Surface Model in Navy's COAMPS, NRL – Monterey, (2002 – 2005, PI), \$120K.
14. Agricultural Weather and Climate Atlas, PI (co-Is: K. Scheeringa, R. Grant, S.Fall), Rice Grant from Purdue Agricultural Research Center, 05/05 – 05/06, \$7K,
15. Lynn Fellowship for Joseph Alfieri, 2006-06, \$15K

Students

Advisor for following five Ph.D. student:

1. Mr. Souleymane Fall, Ph D underway: Dissertation on Utilizing Reanalysis Datasets for Climate Change Studies (supported by NSF ATM, NSF OCI, NASA IDS)
2. Ms. Hsin-I Chang, Ph. D. underway, Dissertation: Land Surface Feedback and the Heavy Rains over Indian Monsoon Region (supported by NASA IDS)
3. Mr. Joseph Alfieri, Ph. D. underway, Dissertation: Terrain and vegetation feedback on regional moisture recycling over the US Southern Great Plains (co-adviser, M. A. LeMone, NCAR) (Joseph received the 3-year NASA Earth System Science Fellowship in 2007)
4. Mr. Lei Ming, Ph. D. Underway, Dissertation: Hydrometeorological impacts of Urban Land Atmosphere Interactions (supported by NASA LCLUC)
5. Ms Uma Charusombat, Ph. D. Underway, Dissertation on : Effect of Droughts on Regional Air Quality, (co-adviser, D. Shepardson, supported by NSF GeoEd and Government of Thailand)
6. Mr. Angel Torres, Ph.D. Underway, Dissertation on: Land Surface Feedbacks on Puerto Rico Climatology, (c-adviser, J. Harbor, supported by Purdue Initiative).

Students Graduated:

1. Mr. Souleymane Fall, Spatiotemporal Climate Variability over Senegal and its relationship with Global Climate, MS Thesis NC State Univ, 2003, (D. Niyogi – Chair; F.Semazzi Co-chair).
2. Ms. Chang, Hsin-I Observations of the effects of aerosol loading on carbon and water cycles over various landscapes, MS Thesis NC State Univ, 2004, (D. Niyogi - Chair; V. Saxena Co-chair).
3. Ms. Tiffanee Jones, A cross-comparison of reference evapotranspiration models using field observations, MS Thesis NC State Univ, (D. Niyogi – Chair), 2004.
4. Mr. Palmieri Richard, Development and evaluation of a weather-based epidemiological model for the prediction of brown patch in creeping bentgrass, MS Thesis NC State Univ (D. Niyogi – Chair, L. Tredway Co-Chair), 2005.
5. Ms. Qureshi, Aneela Laurel, The effects of land-atmosphere interactions on convection initiation and quantitative precipitation forecasts during the international H2O project (IHOP2002), MS Thesis NC State Univ (D. Niyogi - Chair, S. Raman - Co-chair), 2005.

6. Mr. Mera, Roberto J., The effect of multiple environmental changes on crop model response and potential improvements of dynamical land surface, MS Thesis NC State Univ (D. Niyogi - Chair, F. Semazzi Co -chair), 2006.
7. Mr. Occhipinti, Chris, Nitrate Isotopic Composition in Rainfall and Fine Particulate Matter: Back Trajectory Analysis and Source - Receptor Relationships, MS Thesis NC State Univ (V. P. Aneja - Chair, D. Niyogi, Co-chair), 2006.
8. Mr. Konarik, Stephen, Trends in Agricultural Ammonia Emissions and Ammonium Concentrations in Precipitation over the Southeast and Midwest United States, MS Thesis NC State Univ (V.P. Aneja - Chair, D. Niyogi, Co-chair), 2006.
9. Mr. Pyle, Patrick, Urban Land-Surface Impacts on Convective Thunderstorm and Precipitation Characteristics, MS Thesis NC State Univ (D. Niyogi - Chair, S. Pal Arya Co-chair), 2006.
10. Mr. Jeffrey Lewitsky, MS Thesis NC State Univ (F. Semazzi Chair, D. Niyogi co-chair), Black carbon and aerosol characterization at an agricultural site in Southeastern United States, 2007.
11. Ms. Ashley Brooks, M.S., Atmospheric Sciences, Purdue University. Thesis: Assessment of the Spatiotemporal Impacts of Land Use Land Cover Change on the Historical Climate Network Temperature Trends in Indiana.
12. Mr. Ming Lei, M.S. Purdue University, Effect of Urban and Agricultural Land Use Land Cover Change on Mesoscale Thunderstorms and Heavy precipitation.

Staff Supervised:

Postdoctoral Research Associates

- Dr. Anil Kumar Post-doc (2005 2008) Ph D. University of Poona, India, working jointly with National Center for Atmospheric Research, Boulder, CO (2009 onwards working with NASA Hydrology Program)
- Dr. Adam Houston Post-doc (2005) Ph.D. University of Illinois. Currently tenure track faculty at University of Nebraska – Lincoln.

Undergraduate Researchers

- Zachary Payne Frost Climatology for Indiana (2005)
LaPorte Weather Anomaly an Update (2005)
- Brian Wolfe Indianapolis thunderstorm climatology (2005)
- Cassie Hasket Indiana Significant Weather Events (2005)
- Gino Liu Climate Database for Indiana (2005)
- Ashley Brooks Indiana Historical Climate Network Metadata and Quality Control (2005)
- Sherry Smith MARC-AIM undergrad, Crop Modeling and Climate Change (2005)
- Tosha Richardson MARC- AIM undergrad, Urban Impacts on Regional Climate (2006)
- Shawn Cole Agricultural Air Quality (2006)

Technicians, Programmers

- Kenneth Scheeringa Associate State Climatologist (2005 onwards)
- Manish Gupte Scientific Programmer (2005-6), ongoing Ph.D. Economics, Purdue University

Lalit Rastogi	System Administrator (2005-6), MBA Krannert, Purdue University, Currently working with Goldman Sachs Financial Services
Bryn Takle	Project Scientist (2005-6), BS, Univ. of Tennessee, Currently working with State of Kansas.
Meredith Evans	Tech (2005-6), ongoing MS Aeronautics, Purdue University
Mary Maxine Browne	Technical Editor (2005 onwards) Ph.D. English Purdue University
Natasha Duncan	Program Manager (2005 onwards), ongoing Ph.D. Political Science, Purdue University
Patrick Pyle	Tech (2005-), ongoing MS Atmospheric Sciences, NC State University
Arnab Das	System Administrator (2006-) MBA Krannert, Purdue University
Susmit Pal	System Administrator (2006-) MBA Krannert, Purdue University
Selvakumaran V.	Database Manager (2006-) Ph D Electrical Engg., Purdue University

Visiting Scientists Hosted:

A. Chandarasekar	Professor Indiana Institute of Technology (IIT) Kharagpur, Summer 2005
U. C. Mohanty	Chair Professor IIT Delhi, August 2005 and Summer 2006