Prasad Kasibhatla
Associate Professor
Nicholas School of the Environment and Earth Sciences, Duke University
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Educational Background

Ph.D. Chemical Engineering, University of Kentucky	1988
M.S. Chemical Engineering, University of Kentucky	1984
B.S. Chemical Engineering, University of Bombay	1982

Research

Tropospheric chemistry and transport; global tropospheric oxidants; global tropospheric aerosols; regional air quality; anthropogenic impacts on atmospheric composition and ecosystems; global and regional tropospheric chemistry modeling; inverse modeling; chemical data assimilation

Employment

Associate Dean for International Programs, Nicholas School, Duke University	2008 - Present
Associate Professor, Duke University	1999 - Present
Assistant Research Professor, Duke University	1997 - 1999
Research Scientist, MCNC Environmental Programs	1995 - 1996
Research Scientist II, Georgia Institute of Technology	1988 - 1995

Teaching

The Climate System (Team)	Fall 08
Climate Change Science - DEL	Spring 08
What on Earth?	Fall 06-08
Atmospheric Chemistry	Fall 97-01, 03-08
Biogeochemistry (Team)	Fall 07
Biogeochemical Cycle Modeling	Spring 01, 03
Introduction to Environmental Sciences & Policy (Team)	Spring 01-05
Environmental Chemistry and Toxicology (Team)	Spring 02-05

Edited Monograph

Kasibhatla, P., M. Heimann, P. Rayner, N. Mahowald, R. Prinn, and D. Hartley (eds.), *AGU Monograph on Inverse Methods in Biogeochemical Cycles*, AGU Geophysical Monograph Series, vol. 114, 324 pp., 1999.

Publications

1. DeFries, R. S., D. C. Morton, G. R. van der Werf, L. Giglio, G. J. Collatz, J. T. Randerson, R. A. Houghton, **P. Kasibhatla**, and Y. Shimabukuro, Fire-related carbon emissions from land use transitions in southern Amazonia, *Geophys. Res. Lett., 35*, doi:10.1029/2008GL035689, 2008.
2. van der Werf, G. R., J. Dempewolf, S. N. Trigg, J. T. Randerson, **P. S. Kasibhatla**, L. Giglio, D. Murdiyarso, W. Peters, D. C. Morton, G. J. Collatz, and R. S. DeFries, Climate regulation of fire emissions and deforestation in equatorial Asia, *Proceedings of the National Academy of Sciences of the United States of America*, *105*, doi:10.1073/pnas.0803375105, 2008.
3. van der Werf, G. R., D. C. Morton, R. S. DeFries, L. Giglio, J. T. Randerson, G. J. Collatz, and **P. S. Kasibhatla**, Estimates of fire emissions from an active deforestation region in the southern Amazon based on satellite data and biogeochemical modelling, *Biogeosciences Discussions*, *5*, 3533-3573, 2008.
4. Nevison, C. D., N. M. Mahowald, S. C. Doney, I. D. Lima, G. R. van der Werf, J. T. Randerson, D. Baker, **P. S. Kasibhatla**, and G. A. McKinley, Contribution of ocean, fossil fuel, land biosphere and biomass burning carbon fluxes to seasonal and interannual variability in Atmospheric CO_2, *J. Geophys. Res.*, *113*, doi:10.1029/ 2007JG000408, 2008.
5. Bian, H., M. Chin, S. R. Kawa, B. Duncan, A. Arellano, and **P. Kasibhatla**, Sensitivity of global CO simulations to uncertainties in biomass burning sources, *J. Geophys. Res.*, *112*, D23308, doi: 10.1029/2006JD008376, 2007.
6. Corbett, J. J., J. J. Winebrake, E. H. Green, **P. Kasibhatla**, V. Eyring, and A. Lauer, Mortality from ship emissions: A global assessment, *Environ. Sci. Technol.*, *41*, 8512 - 8518, doi: 10.1021/es071686z, 2007.
7. Arellano, A.F., **P. S. Kasibhatla,** L. Giglio, G. R. van der Werf, J. T. Randerson, and G. J. Collatz, Time-dependent inversion estimates of global biomass burning CO Emissions using MOPITT measurements, *J. Geophhys. Res.*, *111*, D09303, doi:10.1029/2005JD06613, 2006.
8. Giglio, L., G. R. van der Werf, J. T. Randerson, G. J. Collatz, and **P. Kasibhatla,** Global estimation of burned area using

MODIS active fire observations, *Atmos. Chem. Phys., 6,* 957-974, 2006.

9. van der Werf, G. R., J. T. Randerson, L. Giglio, G. J. Collatz, **P. Kasibhatla,** and A. F. Arellano, Jr., Interannual variability in global biomass burning emissions from 1997 to 2004, *Atmos. Chem. Phys., 6,* 3423-3441, 2006.
10. Randerson, J. T., , G.R. van der Werf, G.J. Collatz, L. Giglio, C.J. Still, **P. Kasibhatla,** J.B. Miller, J.W.C. White, R.S. DeFries, and E.S., Fire emissions from C3 and C4 vegetation and their influence on interannual variability of atmospheric CO_2 and $\delta^{13}CO_2$, *Global Biogeochemical Cycles, 19,* GB2019, doi:10.1029/2004GB002366, 2005.
11. van der Werf, G. R., J. T. Randerson, G. J. Collatz, L. Giglio, **P. S. Kasibhatla,** A.F. Arellano, Jr., S. C. Olsen, E. S. Kasischke, Continental-scale partitioning of fire emissions during the 1997-2001 El Nino/ La Nina period, *Science, 303,* 73-76, 2004.
12. Arellano, A., **P. Kasibhatla,** L. Giglio, G. R. van der Werf, and J. T. Randerson, Top-down estimates global CO sources using MOPITT measurements, *Geophys. Res. Lett., 31,* L01104, doi:10.1029/2003GL018609, 2004.
13. Yu, S., **P. Kasibhatla,** D. L. Wright, S. E. Schwartz, R. McGraw, and A. Deng, Moment-based simulation of microphysical properties of sulfate aerosols in the eastern United States: Model description, evaluation, and regional analysis, *J. Geophys. Res., 108*(12), 4353, doi:10.1029/2002JD002890, 2003.
14. Giglio, L., J. Pinzon, and **P. Kasibhatla,** Comment on "Seasonal, intraseasonal, and interannual variability of global land fires and their effects on atmospheric aerosol distribution" by Y. Ji and E. Stocker, *J. Geophys. Res., 108*(24), 4754, doi:10.1029/2003JD003548, 2003.
15. Penkett, S. A., K. S. Law, T. Cox, and **P. Kasibhatla,** Atmospheric Photooxidants, in Atmospheric Chemistry in a Changing World, G. P. Brasseur, R. G. Prinn, and A. A. P. Pszenny (eds.), Springer Verlag, Heidelberg, Germany, pp. 73-124, 2003.
16. Granier, C., M. Kanakidou, and **P. Kasibhatla,** Modelling, in Atmospheric Chemistry in a Changing World, G. P. Brasseur, R. G. Prinn, and A. A. P. Pszenny (eds.), Springer Verlag, Heidelberg, Germany, pp. 185-206, 2003.
17. **Kasibhatla, P.,** A. Arellano, J. A. Logan, P. I. Palmer, and P. Novelli, Top-down estimate of a large source of atmospheric carbon monoxide associated with fuel combustion is Asia, *Geophys. Res. Lett., 29*(19), 1900, 10.1029/2002GL015581, 2002.
18. Cooke, W. F., V. Ramaswamy, and **P. Kasibhatla,** A GCM study of the global carbonaceous aersosol distribution, J. *Geophys. Res., 107*(16), 10.1029/2001JD001274, 2002.
19. Wright, D. L., S. Yu, **P. S. Kasibhatla,** R. McGraw, S. E. Schwartz, V. K. Saxena, and G. K. Yue, Retrieval of aerosol properties from moments of the aerosol size distribution for kernels involving the step function: cloud droplet activation, *J. Aerosol. Sci., 33,* 319-337, 2002..
20. Wright, D. L., **P. Kasibhatla,** R. McGraw, and S. Schwartz, Description and evaluation of a six-moment aerosol microphysical module for use in atmospheric chemical transport models, *J. Geophys. Res., 106,* 20275-20291, 2001.
21. Hogrefe, C., S. T. Rao, **P. Kasibhatla**, G. Kallos, C. Tremback, W. Hao, D. Olerud, A. Xiu, J. McHenry, and K. Alapaty, Evaluating the performance of regional-scale photochemical modeling systems: Part I-Meteorological predictions, *Atmos. Environ., 35,* 4159-4174, 2001.
22. Hogrefe, C., S. T. Rao, **P. Kasibhatla,** W. Hao, G. Sistla, R. Mathur, and J. McHenry, Evaluating the performance of regional-scale photochemical modeling systems: Part II-Ozone predictions, *Atmos. Environ., 35,* 4175-4188, 2001.
23. Davis, D. D., G. Grodzinsky, **P. Kasibhatla,** J. Crawford, G. Chen, S. Liu, A. Bandy, D. Thronton, H, Guan, and S. Sandholm, Impact of ship emissions on marine boundary layer NO_x and SO_2 distributions over the Pacific basin, *Geophys. Res. Lett., 28,* 235-238, 2001.
24. Rao, S. T., C. Hogrefe, H. Mao, J. Biswas, I. Zurbenko, P. S. Porter, **P. Kasibhatla,** and D. A. Hansen, How should the photochemical modeling systems be used in guding emissions management decisions? in *Air Pollution Modeling and its Application XIV* (Gryning and Schiermeier, eds.), 25-34, Kluwer Academic/Plenum Publishers, New York, 2001.
25. Barrie, L. A., Y. Yi, W. R. Leitch, U. Lohmann, **P. Kasibhatla,** G. -J. Roelofs, J. Wilson, F. McGovern, C. Benkovitz, M. A Melieres, K. Law, J. Prospero, M. Kritz, D. Bergmann, C. Bridgeman, M. Chin, J. Christensen, R. Easter, J. Feichter, C. Land, A. Jeuken, E. Kjellstrom, D. Koch, and P. Rasch, A comparison of large scale atmospheric sulphate aerosol models (COSAM): overview and highlights, *Tellus, 53B,* 615-645, 2001.
26. Roleofs, G. J., **P. Kasibhatla,** L. Barrie, D. Bergmann, C. Bridgeman, M. Chin, J. Christensen, R. Easter, J. Feichter, A. Jeuken, E. Kjellstrom, D. Koch, C. Land, U. Lohmann, and P. Rasch, Analysis of regional budgets of sulfur species modeled for the COSAM exercise, *Tellus, 53B,* 673-694, 2001.
27. **Kasibhatla, P.**, and W. L. Chameides, Seasonal modeling of regional ozone pollution in the eastern United States, *Geophys. Res. Lett., 27,* 1415-1418, 2000.
28. **Kasibhatla, P.,** H. Levy II, W. J. Moxim, S. N. Pandis, J. J. Corbett, M. C. Peterson, R. E. Honrath, G. J. Frost, K. Knapp, D. D. Parrish, and T. B. Ryerson, Do emissions from ships have a significant impact on concentrations of nitrogen oxides in the marine boundary layer?, *Geophys. Res. Lett., 27,* 2229-2232, 2000.
29. Houyoux, M. R., J. M. Vukovich, C. J. Coats, Jr., N. J. M. Wheeler, and **P. S. Kasibhatla**, Emission inventory development and processing for the Seasonal Model for Regional Air Quality (SMRAQ) project, *J. Geophys. Res., 105,* 9079-9090, 2000.
30. Holloway, T., H. Levy II., and **P. Kasibhatla**, The global distribution of carbon monoxide, *J. Geophys. Res., 105,* 12123-12147, 2000.
31. Chen, G., D. D. Davis, **P. Kasibhatla**, A. R. Bandy, D. C. Thornton, B. J. Huebert, and A. D. Clarke, A study of DMS oxidation in the tropics: Comparison of Christmas Island field observations of DMS, SO2, and DMSO with model simulations, *J.*

Atmos. Chem., 37, 137-160, 2000.
32. Rasch, P. J., et al., A comparison of scavenging and deposition processes in global models; results from the WCRP Cambridge workshop of 1995, *Tellus, 52B,* 1025-1056, 2000.
33. Capaldo, K., J. J. Corbett, **P. Kasibhatla**, P. Fischbeck and S. N. Pandis, Effects of ship emissions on sulphur cycling and radiative climate forcing over the ocean, *Nature, 400,* 743-745, 1999.
34. Capaldo, K. P., **P. Kasibhatla**, and S. N. Pandis, Is aerosol production within the remote marine boundary layer sufficient to maintain observed aerosol concentrations, *J. Geophys. Res., 104,* 3483-3500, 1999.
35. Chen, G., D. Davis, **P. Kasibhatla**, A. Bandy, D. Thornton, and D. Blake, A mass-balance/photochemical assessment of DMS sea-to-air flux as inferred from NASA GTE PEM-West A and B observations, *J. Geophys. Res., 104*, 5471-5482, 1999.
36. Isaksen, I., C, Jackman, S. Baughcum, F. Dentener, W. Grose, **P. Kasibhatla**, D. Kinnison, M. K. W. Ko, J. C. McConnell, G. Pitari, and D. J. Wuebles, Modeling the chemical composition of the future atmosphere, in *Aviation and the Global Atmosphere: A Special Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, 1999.
37. Levy II, H., W. J. Moxim, A. A. Klonecki, and **P. Kasibhatla**, Simulated tropospheric NOx: Its evaluation, global distribution and individual source contributions, *J. Geophys. Res., 104,* 26279-26306, 1999.
38. **Kasibhatla, P.**, W. L. Chameides, R. D. Saylor, and D. Olerud, Relationships between regional ozone pollution and emissions of nitrogen oxides in the eastern United States, *J. Geophys. Res., 103,* 22663-22669, 1998.
39. Davis, D., G. Chen, **P. Kasibhatla**, A. Jefferson, D. Tanner, F. Eisele, D. Lenschow, W. Neff, and H. Berresheim, DMS oxidation in the Antarctic marine boundary layer; Comparison of model simulations and field observations of DMS, DMSO, $DMSO_2$, H_2SO_4(g), MSA(g), and MSA(p), *J. Geophys. Res., 103,* 1657-1678, 1998.
40. **Kasibhatla, P.**, W. L. Chameides, B. Duncan, M. Houyoux, C. Jang, R. Mathur, T. Odman, and A. Xiu, Impact of inert organic nitrate formation on ground-level ozone in a regional air quality model using the carbon bond mechanism 4, *Geophys. Res. Lett., 24,* 3205-3208, 1997.
41. **Kasibhatla, P.**, W. L. Chameides, and J. St. John, A three-dimensional global model investigation of seasonal variations in the atmospheric burden of anthropogenic sulfate aerosols, *J. Geophys. Res., 102,* 3737-3759, 1997.
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47. Allen, D. J., **P. Kasibhatla**, A. M. Thompson, R. B. Rood, B. G. Doddridge, K. E. Pickering, R. D. Hudson, and S. -J. Lin, Transport-induced interannual variability of carbon monoxide using a chemistry and transport model, *J. Geophys. Res., 101,* 28655-28669, 1996.
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51. H. Levy II, J. Y. Yienger, W. J. Moxim, **P. S. Kasibhatla**, and W. L. Chameides, The increase of pollutants (nitrogen oxides and ozone) in the summertime midwest, in *Preparing for Global Change: A Midwestern Perspective,* edited by G. R. Carmichael, G. E. Folk, and J. L. Schnoor, SPB Academic Publishing bv, Amsterdam, The Netherlands, pp. 11-19, 1995.
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1707-1710, 1993.

55. **Kasibhatla, P. S.**, H. Levy II, and W. J. Moxim, Global NO_x, HNO_3, PAN, and NO_y distributions from fossil fuel combustion emissions: A model study, *J. Geophys. Res.*, *98*, 7165-7180, 1993.
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58. **Kasibhatla, P. S.**, H. Levy II, W. J. Moxim, and W. L. Chameides, The relative impact of stratospheric photochemical production on tropospheric NOy levels: A model study, *J. Geophys. Res.*, *96*, 18631-18646, 1991.
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60. **Kasibhatla, P. S.**, and L. K. Peters, Numerical simulation of transport from a point source - error analysis, *Atmos. Environ.*, *24*, 693-702 1990.
61. Seward W. L., **P. S. Kasibhatla,** and G. Fairweather, On the numerical-solution of a model air-pollution problem with nonsmooth nitial data, *Comm. Appl. Num. Meth.*, *6*, 145-156, 1990.
62. **Kasibhatla, P. S.**, L. K. Peters, and G. Fairweather, Numerical simulation of transport from an infinite line source - error analysis, *Atmos. Environ.*, *24*, 693-702 1990.
63. Dronamraju. M, L. K. Peters, G. R. Carmichael, **P. Kasibhatla**, and S. Y. Cho, An eulerian transport transformation removal model for SO2 and sulfate .3. Comparison with the July 1974 SURE database, *Atmos. Environ.*, *22*, 2003-2011 1988.

Service

- Chair, Nicholas School of the Environment and Earth Sciences Faculty Council (Fall 2007 - Spring 2008)
- Co-chair, University Reaccreditation Quality Enhancement Plan Committee (Fall 2007 - Present)
- Chair, University Strategic Planning Steering Committee (Fall 2005 - Spring 2006)
- Member, Duke University Presidential Search Committee (2003)
- Chair, Duke University Academic Council Student Affairs Committee (Spring 2004 - Spring 2006)
- Chair, Duke University Ad Hoc Committe on Early-Admits of Student-Athletes (Spring 2003)
- Member, National Academy of Sciences Committee in Air Emissions from Animal Feeding Operations (Spring 2002 - Fall 2002)
- Member, Duke University Research Policy Committee (Fall 2002 - Spring 2006)
- Faculty Representative, Duke University Athletic Council (Fall 2001 - Present)
- Faculty Representative, Duke University Board of Trustees Student Affairs Committee (Fall 2001 - Spring 2006
- Faculty Advisor, Duke South Asian Student Association (Fall 2004 - Present)
- Member, President's ad hoc committee on Duke University Athletic Drug Policy (Fall 2005)
- Member, NCAA Certification Executive Committee (Spring 2005)
- Member, Environmental Chemistry Faculty Search Committee, Nicholas School of the Environment and Earth Sciences, Duke University (Fall 2004 - Spring 2005)
- Member, Executive Committee of the Academic Council (Fall 2001-Spring 2002))
- Member, Provost's Task Force on the Nicholas School of the Environment (Spring 2000)
- Member, Chair Search Committee, Department of Civil and Environmental Engineering, Duke University (Spring 2000)
- Co-convener, International Atmospheric Chemistry Project/Global Integration and Modeling Activity (1996-2001)
- Co-organizer, Workshop and Conference on Chemistry-Climate Interactions, Trieste, Italy (May 29-June 14, 2000)
- Co-organizer, Workshop on Inverse Methods in Global Biogeochemical Cycles, Heraklion, Crete (March 16-20, 1998)
- Member, Organizing Committee of the Fourth World Climate Research Program Workshop on Chemical Transport Modeling, Halifax, Canada (October 19-21, 1998)

Grants

P.I.: Fires and Tropospheric Chemistry: Analysis Uing Remote Sensing Measurements
Sponsor: NASA
Period: 6/1/08 - 5/31/11
Award: $90,000

P.I.: A Modeling and Analysis Study to Quantify the Impact of Biomass Burning on Tropospheric Chemistry Using Remote Sensing Measurements
Sponsor: NASA
Period: 4/1/08 - 3/31/11

Award: $331,300

Co-I.: Global fire emissions derived from Terra and Aqua satellites
Sponsor: NASA
Period: 3/1/08 - 2/28/11
Award: $214,251

P.I.: Quantifying anthropogenic sources of trace gases and aerosols: An integrated approach
Sponsor: NASA
Period: 2/1/04 - 7/31/07
Award: $225,646

co-I.: Using Satellite and Inverse Techniques to Constrain Regional and Global Fire Emissions from 1997 to 2005: An Approach Based on the Carbon Isotope Ratio of Fire Emissions
Sponsor: NASA
Period: 6/1/04 - 5/31/08
Award: $248,996

co-I.: Marine Shipping Health Impact Study
Sponsor: Clean Air Task Force
Period: 7/10/06 - 7/10/07
Award: $37,797

P.I.: Continued development and application of of data assimilation techniques for tropospheric chemistry studies
Sponsor: NASA
Period: 6/1/00 - 9/30/03
Award: $662,337

P.I.: A study of carbon monoxide using trace constituent data assimilation: A new approach in global tropospheric chemistry analysis
Sponsor: NASA
Period: 1/1/97 - 12/31/00
Award: $741,022

P.I.: A theoretical investigation of the coupled sulfur/aerosol/climate system using the NOAA/GFDL SKYHI GCM
Sponsor: NOAA
Period: 7/1/97 - 6/30/2000
Award: $192,901

Co-I.: Southern Center for the Integrated Study of Secondary Air Pollutants (SCISSAP)
Sponsor: EPA
Period: 4/1/98 - 3/21/2001
Award: $3,000,000 (Co-I share: 225,000)

P.I.: The accelerated development and application of the seasonal model for regional air quality in the South: Year 2
Sponsor: NC-DEHNR
Period: 9/15/97 - 9/15/98
Award: $300,000

co-I. and Technical Lead: The accelerated development and application of the seasonal model for regional air quality in the South: Year 1
Sponsor: NC-DEHNR
Period: 9/15/96 - 9/15/97
Award: $475,000

P.I.: Theoretical and global model studies of the atmospheric sulfur/aerosol system.
Sponsor: NASA

Period: 6/1/93 - 9/30/97
Award: $374,884

P.I.: Global-scale model studies of tropospheric ozone, with emphasis on the North Atlantic atmosphere.
Sponsor: NOAA
Period: 6/1/93 - 12/31/95
Award: $159,000

Co-P.I.: Theoretical and diagnostic studies in tropospheric chemistry and the atmospheric cycles of ozone, N, and S
Sponsor: NSF
Period: 5/1/93 - 4/30/96
Award: $365,000