Jinyun Tang

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Education

Ph.D. Atmospheric Science, Purdue University, May, 2011.

M.A. Atmospheric Science, Nanjing University, P. R. China, 2006.

B.S. Atmospheric Science, Nanjing University, P. R. China, 2003.

Professional Services

Proposal reviewer

European Research Council (ERC)

Journal reviewer

Global Change Biology, Journal of the Royal Society Interface, Ecology and Evolution, Tellus B, JAMES, Biogeosciences, Environmental Modelling & Software, JGR-Atmosphere, Remote Sensing of Environment.

Research Interests

Earth system sciences, e.g., Land surface modeling, terrestrial ecosystem modeling, microbial ecology, data assimilation, atmospheric transport and inverse modeling

Research Experience

Lawrence Berkeley national laboratory

Research Scientist, Oct 2013-Now

Postdoc Fellow, Bill Riley (Supervisor), May 2011-Sep 2013.

Department of Earth and Atmospheric, Purdue University

Research Assistant, Qianlai Zhuang (Advisor), Summer 2006–May 2011.

Department of Atmospheric Sciences, Nanjing University

Research Assistant, Yuan Wang (Advisor), Fall 2003–Spring 2006.

Teaching Experience

Guest lecture for EAS 591W&AGRY 598A, Modeling Ecosystems and Biogeochemical Cycles. On parameter estimation, uncertainty propagation and quantification in numerical model development.

Teaching assistant for undergraduate course: Fluid Mechanics, grading and guest lecture, Nanjing University, Fall 2005.

Leadership Activities

Convener: with N. Bouskill, W. J. Riley and E. Brodie, B038. Integrating microbial processes into ecosystem models of carbon and nitrogen cycling, AGU Fall Meeting, 2012.

Projects & Grants

1. Improving a process-based biogeochemistry model using an atmospheric transport chemistry model and in-situ and remotely-sensed terrestrial and atmospheric data, 84,000$ with Qianlai Zhuang, 2007-2011
2. Understanding litter input controls on soil organic matter turnover and formation are essential for improving carbon-climate feedback predictions for Arctic tundra ecosystems, DOE-TES, DE-FOA-0000749, co-I with Matthew Wallenstein, Rich Conant, M. Francesca Cotrufo, Eldor Paul and Bill Riley, funded.
3. LDRD 2014, co-I with Bill Riley and Jeff Chambers, funded.

Honors & Awards

1. PCCRC Fellowship, 2006-2007.
2. Incentive grant from Purdue graduate school, 2007
3. NASA Earth System Science (ESS) Fellowship, 2007-2010
4. Bilsland Dissertation Fellowship, 2010-2011

Computer Skills

Programming languages: C, C^{++} , Fortran, Perl & Python (sort of)

Operating systems: Linux, Windows, Mac.

Mathematics: Matlab, Mathematica.

Other: IDL, TEX, LATEX.

Publications

Published

1. Tang, J. Y. and Riley, W. J.: A total quasi-steady-state formulation of substrate uptake kinetics in complex networks and an example application to microbial litter decomposition, Biogeosciences, 10,

8329-8351, doi:10.5194/bg-10-8329-2013, 2013.

2. Koven C.D., W. J. Riley, M. S. Torn, Z. M. Subin, J. Y. Tang, D. M. Lawrence, S. C. Swenson and G. B. Bonan (2013), The effect of vertically-resolved soil biogeochemistry on C and N dynamics in a land surface model, Biogeosciences, 10, 7109-7131, doi:10.5194/bg-10-7109-2013.

3. Zhuang Q., K. Xu, J. Y. Tang and et al. (2013), Responses of global soil consumption of atmospheric methane to changes in atmospheric climate, methane concentration and NHx deposition, Global Biogeochemical Cycles, 27, doi:10.1002/gbc.20057.

4. Tang J. Y. and W. J. Riley (2013), Impacts of a New Bare Soil Evaporation Formulation on Site, Regional and Global Surface Energy and Water Budgets in CLM4, JAMES, 5, doi:10.1002/jame.20034.

5. Tang J. Y., W. J. Riley, C. D. Koven and Z. M. Subin (2013), CLM4-BeTR, A generic biogeochemical transport and reaction module for CLM4: theoretical developments and a site level evaluation, http://www.hydrol-earth-syst-sci.net/17/873/2013/hess-17-873-2013.html

6. Tang J. Y. and W. J. Riley (2013), A new top boundary condition for modeling surface diffusive exchange of a generic volatile tracer: theoretical analysis and application to soil evaporation, http://www.geosci-model-dev.net/6/127/2013/gmd-6-127-2013.html.

7. Bouskill N, J. Y. Tang, W. J. Riley and E. L. Brodie (2012). Trait-based representation of biological nitrification: Model development, testing, and predicted community composition. Front. Microbio. 3:364. doi: 10.3389/fmicb.2012.00364. (I developed the model)

8. Tang J. Y. and Q. Zhuang (2011), Technical Note: Propagating correlations in atmospheric inversions using different Kalman update smoothers, Atmos. Chem. Phys., 11, 921-929, doi:10.5194/acp-11-921-2011.

9. Tang J. Y. and Q. Zhuang (2010), Modeling soil thermal and hydrological dynamics and changes of growing season in Alaskan terrestrial ecosystems, Climatic Change, doi: 10.1007/s10584-010-9988-1.

10. Tang J. Y., Q. Zhuang, R. D. Shannon, and J. R. White (2010), Quantifying wetland methane emissions with process-based models of different complexities, Biogeosciences, 7, 3817-3837, doi:10.5194/bg-7-3817-2010.

11. Tang J. Y., and Q. Zhuang (2010), Technical Note: Methods for interval constrained atmospheric inversion of methane, Atmos. Chem. Phys. Discuss., 10, 1998120004, 2010, www.atmos-chem-phys-discuss.net/10/19981/2010/, doi:10.5194/acpd-10-19981-2010.

12. Tang J. Y. and Q. Zhuang (2009), A global sensitivity analysis and Bayesian inference framework for improving the parameter estimation and prediction of a process-based Terrestrial Ecosystem Model, J. Geophys. Res., 114, D15303, doi:10.1029/2009JD011724.

13. Tang J. Y. and Q. Zhuang (2008), Equifinality in Parameterization of Process-Based Biogeochemistry Models: A Significant Uncertainty Source to the Estimation of Regional Carbon Dynamics. J. Geophys. Res. - Biogeos. ,doi:10.1029/2008JG000757.

14. Tang J. Y., J. Tang and Y. Wang (2007), Analytical Investigation on the 3D Non-Boussinesq Mountain Wave Drag for Wind Profiles With Vertical Variations. Applied Mathematics and Mechanics (English Edition), 28(3), 327-335, 2007.

15. Wang Y., J. Y. Tang and R. Wu (2007), A two-wave scheme for orographic gravity wave parameterization. Acta Meteorologica Sinica (Chinese) Vol.65, No.5, 2007. (I designed the the parameterization scheme)

In review

1. W. J. Riley, F. M. Maggi, M. Kleber, M. S. Torn, J. Y. Tang, D. Dwivedi, and N. Guerry, Long residence times of rapidly decomposable soil organic matter: application of, a multi-phase, multi-component, and vertically-resolved model (TOUGHREACTv1) to soil carbon dynamics, Geosci. Model Dev. Discuss.,2014
2. Tang J. Y. and W. J. Riley, Technique note: Simple formulations and solutions of the dual-phase diffusive transport for biogeochemical modeling, Biogeosciences, 2014.

In preparation

Posters and talks

1. Tang J.Y. and W.J. Riley, The emergent temperature sensitivity of decomposition from interactions between microbes, substrates, and the soil environment, AGU Fall meeting, SF, Dec. 2013 (Invited).
2. Tang J.Y. W.J. Riley, N. Bouskill and E. BrodieLet the microbes explicitly carry out the reactions: a new paradigm to the modeling of soil carbon-nutrient dynamics, AGU Fall meeting, SF, Dec. 2013 (Invited).
3. Tang J.Y., W. J. Riley, C. D. Koven and Z. M. Subin, A Reactive Transport Module of Land Biogeochemistry in the Community Land Model: Description, Evaluation, and Application, SSSA, Tampa, Nov. 2013, (Invited).
4. Bouskill N., J. Y. Tang, W.J. Riley, E.L. Brodie, Developing a high-latitude soil carbon cycle model with a focus on trait-based representation of decomposition, AGU Fall Meeting, 2012.
5. Koven C. D., W.J. Riley, M.S. Torn, Z.M. Subin, J. Y. Tang, D.M. Lawrence, S.C. Swenson, G.B. Bonan, Development, testing, and dynamics of a vertically-resolved C and N model in CLM4, AGU Fall meeting, 2012.
6. Zhuang Q., Q. Zhu, M. Chen, J. Y. Tang, Y. Jiang, X. Lu, Constrained terrestrial ecosystem carbon fluxes of North America with eddy flux and satellite data during the MODIS era, AGU Fall meeting, 2012.
7. Tang J. Y., W.J. Riley, C.D. Koven and M.S. Torn, Characterizing the Measurements Necessary to Constrain Soil Biogeochemistry Structural Uncertainty in CLM4: a Measurement-Oriented Modeling Approach, AGU Fall meeting, 2012.
8. Tang J. Y. and Bill Riley, A new physics-based formulation of soil evaporation in CLM4, 17th annual CESM workshop, Breckenridge, CO, Jun, 2012.
9. Riley W. J., C. D. Koven, Z. Subin and J. Y. Tang, Progress toward a mechanistic belowground N cycle in CLM, NCAR, Boulder, CO, Mar. 2012.
10. Bouskill N. J., J. Y. Tang, W. J. Riley, E. L. Brodie, Developing a high-latitude soil carbon and nitrogen cycle model with a focus on trait-based modeling of the biological nitrogen cycle, American Society of Microbiology, SF, CA, Jun. 2012.
11. Tang J. Y., N. J. Bouskill, W. J. Riley and E. L. Brodie, Incorporating enzyme and microbial dynamics into the global land model CLM4: Plans, progress and preliminary results, Colorado State University, Fort Collins CO, May, 2012 (invited).
12. Koven C. D., W. J. Riley, M. Torn, Z. Subin and J. Y. Tang, D. Lawrence, G. Bonan, S. Swenson, Soil BGC developments in CLM4, NCAR, Boulder, CO, Mar. 2012.

13. Tang J. Y., W. J. Riley, C. D. Koven and Z. Subin, Progress in developing CLM4-BeTR: a tool for incorporating and evaluating different formulations of below ground biogeochemistry, NCAR, Boulder, CO, Mar., 2012.

14. Koven C. D., William J. Riley, Zachary M. Subin, J. Y. Tang, Margaret Torn, Jennifer Harden, David Lawrence, Gordon Bonan, Sean Swenson. Permafrost C and N Dynamics in CLM4. Department of Energy Climate and Earth System Modeling Principal Investigators Meeting, Washington, DC, September 20, 2011.

15. Koven C. D., W. J. Riley, Z. M. Subin, J. Y. Tang, M. S. Torn, D. M. Lawrence, G. B. Bonan, S. C. Swenson. Permafrost carbon and nitrogen dynamics in CLM4. American Geophysical Union Fall Meeting, San Francisco, CA, December 5-9, 2011.

16. Subin Z. M., J. Y. Tang, W. Riley, C. D. Koven, and M. Torn, Modeling Carbon Cycling in High-Latitude Ecosystems to Understand Interactions with Climate Change. International Arctic Research Center, Fairbanks, AK,August 24, 2011.

17. Tang J. Y., W. Riley, Z. Subin, C. D. Koven and M. Torn, Developing CLM4-BeTR: Biogeochemical Transport and Reaction modeling in CLM4, Lawrence Berkeley National Lab, Oct, 24, 2011

18. Tang J. Y., W. Riley, Z. Subin, C. D. Koven and M. Torn, Developing a generic reactive transport module for CLM: the CLM4BeTR, Washington D.C., Sep. , 2011.

19. Tang J. Y., W. Riley, Z. Subin, C. D. Koven and M. Torn, Biogeochemical transport and reaction modeling for CLM4: developing the CLM4BeTR, University of Alaska, Aug, 2011 (invited).

20. Tang J. Y., Q. Zhuang and X. Xiong, 4D-Var inversion of atmospheric methane fluxes by assimilating SCIAMACHY and AIRS satellite retrievals, AGU, San Francisco, CA, 14-18 December, 2010.

21. Zhuang Q., J. Y. Tang, Y. Lu, X. Xiong, J. Melillo, R. Prinn, and A. D. McGuire, Evaluating Contributions of Wetland and Lake Emissions of Methane to Atmospheric Methane Concentrations with models of Biogeochemistry and Atmospheric Chemistry Transport in Northern High Latitudes, AGU, San Francisco, CA, 14-18 December, 2009.

22. Tang J. Y., and Q. Zhuang, A Sigma-point Kalman Smoother for Atmospheric Trace Gas Inversion, AGU, San Francisco, CA, 14-18 December, 2009.

23. Zhuang Q., J. Y. Tang, J. Melillo, M. Chen, Y. Jiang, X. Lu, D. Kicklighter, R. Prinn, and A. D. McGuire, Constraining Uncertainty of Carbon Dynamics in North America Using Eddy Flux Measurements and Satellite-Based Net Primary Production Data, 8th International Carbon Dioxide Conference, Jena, Germany, September 13-19, 2009.

24. Zhuang Q., J. Y. Tang, Y. Lu, K. Xu, X. Xiong, J. Melillo, R. Prinn, and A. D. McGuire, Evaluating Contributions of Wetland and Lake Emissions of Methane to Atmospheric Methane Concentrations with a Processed-Based Biogeochemistry Model and an Atmospheric Chemistry Transport Model and Satellite Retrieval Data in Northern High Latitudes, AGU Assembly, Toronto, Canada, 2427 May 2009.

25. Tang J. Y., and Q. Zhuang, Evaluating hotspot tropospheric methane concentrations in Himalaya region with GEOS-Chem and AIRS satellite retrievals, The 4th GEOSChem Scientific and Users' Meeting, Harvard University, April 7-10, 2009.

26. Tang J. Y., Q. Zhuang, Quantifying the Uncertainty in Estimating the Regional Carbon Dynamics due to the Parameterization Equifinality in Process-based Biogeochemistry Models, Purdue Green Week, Student Poster Symposium, Purdue University, IN, Sept. 18, 2008.

27. Zhuang Q., J. Y. Tang, M. Chen, and Y. Jiang, Constrain the Uncertainty of Terrestrial Ecosystem Carbon Sink in North America with Eddy Flux Measurements, international scientific congress on climate change, "Climate Change: Global Risks, Challenges and Decisions", in Copenhagen, Denmark, 10-12 March 2009.

28. Tang J. Y., Q. Zhuang, J.R. White, R.D. Shannon, P. Crill, Assessing the role of different wetland methane emission pathways with a biogeochemistry model, AGU fall meeting, 15-19 December 2008.

29. Tang J. Y. and Q. Zhuang, Quantifying the Uncertainty in Estimating the Regional Carbon Dynamics due to the Parameterization Equifinality in Process-based Biogeochemistry Models, Purdue Green Week, Student Poster Symposium, Purdue University, IN, Sept. 18, 2008.

30. Zhuang Q., K. Xu, and J. Y. Tang, Evaluating effects of changes of climate, land-use and land-cover, and atmospheric nitrogen deposition and methane concentrations on global soil methane consumption, 93rd ESA Annual Meeting, Milwaukee, Wisconsin, August 3-8, 2008

31. Tang J. Y., Q. Zhuang, Changes of Growing Season Length and Soil Thermal Regimes in Alaskan Boreal Forests, 93rd ESA Annual Meeting, Milwaukee, Wisconsin, August 3-8, 2008

32. Tang J. Y. and Q. Zhuang, Equifinality in Parameterization of Process-Based Biogeochemistry Models: A Significant Uncertainty Source to Estimation of Regional Carbon Dynamics, ASCENDS Workshop, University of Michigan, Ann Arbor, Michigan, July 23, 2008

33. Zhuang, Q., K. Xu, J. Y. Tang, Responses of global soil methane consumption to changes of climate, land-use and land-cover, and atmospheric chemistry deposition during the 20th century, European Geosciences Union, General Assembly 2008, Vienna, Austria, 13 18 April 2008

34. Lu X., Q. Zhuang, Y. Hu, and J. Y. Tang, Modeling Responses of Net Primary Productivity to Climatic Changes in Indiana During the 20th Century, Purdue Ecological Sciences and Engineering Symposium, Purdue University, IN. November 9, 2007.

35. Tang J. Y., Q. Zhuang, Quantifying the Uncertainty of Carbon Dynamics in Boreal Forests with High-performance Computing, Computing Research Institute poster session, Purdue University, IN. October 25, 2007.

36. Tang J. Y., Q. Zhuang, A Global Sensitivity Analysis and Bayesian Inference Framework to Improve the Parameter Estimation and Prediction of Process-Based Terrestrial Ecosystem Models, Purdue Ecological Sciences and Engineering Symposium, Purdue University, IN. November 9, 2007.

Thesis

Master thesis: gravity wave drag over complex terrains: its computation and parameterization, June, 2006.

PhD thesis: Improving a process-based biogeochemistry model using an atmospheric transport chemistry model and in-situ and remotely-sensed terrestrial and atmospheric data, May, 2011.

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