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RESEARCH INTERESTS

Global methane cycle, greenhouse gases, climate mitigation strategy, wetlands, atmospheric chemistry, dynamic global vegetation model, ecosystem service, ecosystem modeling

EDUCATION

Nanjing University, China	Geography	Ph.D. 2013
Nanjing Institute of Meteorology, China	Geography	B.Sc. 2006

POSITIONS HELD

Postdoctoral Researcher 2017-present
Department of Geographical Sciences,
University of Maryland College Park, United States

Visiting Scientist 2017-present
Biospheric Sciences Laboratory
NASA Goddard Space Flight Center

Guest Scientist 2017-present
Dynamic Macroecology Group
Swiss Federal Research Institute WSL, Switzerland

Postdoctoral Scientist 2014-2017
Dynamic Macroecology Group
Swiss Federal Research Institute WSL, Switzerland

Affiliated Assistant Professor 2014-2017
Department of Ecology
Montana State University, United States

Research Faculty 2013-2014
Laboratory of Remote Sensing and Geospatial Science
Cold and Arid Regions Environmental and Engineering Research Institute
Chinese Academy of Science

Graduate Research Assistant 2009-2013
Department of Geography
Nanjing University, China

High Performance Cluster (HPC) Administrator 2009-2013
Department of Geography
Nanjing University, China

MEMBERSHIPS

American Geophysical Union (AGU), Young Earth System Scientist Community, Future Earth Network, Permafrost Carbon Network, FLUXNET Young Scientist Group

PROFESSIONAL SERIVICE & SYNERGISTIC ACTIVITIES

- Referee for: Global Change Biology, Environmental Research Letter, Geoscientific Model Development, Biogeosciences, Carbon Balance and Management, Global and Planetary Change, International Journal of Climatology, Forests, PLOS ONE, Ecological Research, China Science Bulletins
- Reviewer for: National Natural Science Foundation of China (NSFC) (2017), NSFC 2016, NSFC 2015, NSFC 2014; Natural Environment Research Council of United Kingdom, Standard Grant 2018.

OUTREACH & PUBLIC SERIVCE

- Invited Reviewer for *Climate Feedback*, a global network platform dedicative to provide assessment of influential climate change media coverage.

- Our study "Emerging role of wetland methane emissions in driving 21st century climate change" was selected to exhibit at United Nations Climate Change Conference (COP23) in Bonn, Germany, 2017 by Center for Global Sustainability, University of Maryland.
- An interview by China Meteorological Newspaper (in Chinese) "Wetland could play an important role in future climate change" on Sep. 22nd 2017.
- Invited Research News by Chinese Academy of Sciences, "Radiative forcing feedback caused by wetland methane emissions could overwhelm anthropogenic counterpart in 21st century" on Aug 22nd 2017.
- Invited talk "Emerging role of wetland methane emissions in driving 21st century climate change" by NOAA Science Seminar Series, Sep 7th, 2017.
- International Conference on Permafrost ICOP 2016, Potsdam, Germany. Oral presentation. Title: Role of wetlands in projected future permafrost carbon-climate feedbacks: A model analysis with land surface model LPJ-wsl.
- American Geophysical Union Fall meeting 2015, San Francisco, US. Poster presentation. Title: Modeling spatio-temporal dynamics of global wetlands: a TOPMODEL parameterization and uncertainties
- "Mining FLUXNET and other carbon data sources to inform earth system models", FLUXNET Workshop 2015, Beijing, China.
- Supervising graduate students at Swiss Federal Institute of Technology in Zurich (ETHZ) for course "Spatial Modeling from Climate & Land Use Change to Biodiversity Conservation", Aug-Dec, 2016.
- Teaching in a workshop 'Macroecology, Species Distribution and Climate Change' held in Peking University, China, 2016, June.
- American Geophysical Union Fall meeting 2014, San Francisco, US.

RESEARCH PROJECTS

- 2017-present Quantifying Sources and Sinks in the Global Methane Cycle. This is international-collaborative project funded by US Gordon and Betty Moore Foundation, dedicating to investigate the role of methane in global methane cycle and to estimate the methane source and sink with multiple model technologies.
- 2017-present A Model-Data Integration Framework (MoDIF) for ABoVE Phase I research: simulation, scaling and benchmarking for key indicators of Arctic-boreal ecosystem dynamics.
- 2014-present Global Carbon Project Methane. EU FP7 GEOCARBON Programme (283080) Bottoms-up estimates group using Land surface models

- 2012-2017 MAIOLICA II. ETH-CCES Project. Modelling and experiments on land-surface interactions with atmospheric chemistry and climate II.
- 2013-2016 Joint estimation of states and parameters for simulated effect of heterogeneous rising atmospheric CO_2 on carbon budget of terrestrial ecosystems in China. National Natural Science Foundation of China for Young Scientists (Y411391001).
- 2010-2013 Application of land cover map from remote sensing in land surface ecosystem modeling. State High Technology Funds of China.
- 2009-2013 Changing mechanisms and optimized computing research on the carbon sources and sink of global terrestrial ecosystems, State Key Fundamental Science Funds of China.

PEER REVIEWED PUBLICATIONS

1. Sara H. Knox, Robert B. Jackson, Benjamin Poulter, Gavin McNicol, Etienne *Fluet-Chouinard*, **Zhen Zhang**, Gustaf Hugelius, Philippe Bousquet, Josep G. Canadell, Marielle Saunois, Dario Papale, Housen Chu, Trevor F. Keenan, Dennis Baldocchi, Ivan Mammarella, Carlo Trotta, Mika Aurela, Gil Bohrer, Dave Campbell, Alessandro Cescatti, Samuel Chamberlain, Jiquan Chen, Sigrid Dengel, Ankur R. Desai, Eugenie Euskirchen, Thomas Friborg, Ignacio Goded, Mathias Goeckede, Martin Heimann, Manuel Helbig, Takashi Hirano, David Hollinger, Hiroki Iwata, Minseok Kang, Janina Klatt, Ken W. Krauss, Lars Kutzbach, Annalea Lohila, Vincenzo Magliulo, Bhaskar Mitra, Timothy H. Morin, Mats B. Nilsson, Shuli Niu, Asko Noormets, Walter C. Oechel, Matthias Peichl, Olli Peltola, Michele L. Reba, Andrew Richardson, Benjamin R. K. Runkle, Youngryel Ryu, Torsten Sachs, Karina V. R. Schäfer, Hans Peter Schmid, Narasinha Shurpali, Oliver Sonnentag, Angela C. I. Tang, Margaret Torn, Masahito Ueyama, Rodrigo Vargas, Timo Vesala, Eric J. Ward, Lisamarie Windham-Myers, Georg Wohlfahrt, and Donatella Zona, FLUXNET-CH4 Synthesis Activity: Objectives, Observations, and Future Directions. Bulletin of the American Meteorological Society. (under review)
2. Zheng Fu, Paul C. Stoy, Benjamin Poulter, Tobias Gerken, **Zhen Zhang**, Guta Wakbulcho, Shuli Niu. Maximum carbon uptake rate dominates the interannual variability of global net ecosystem exchange. Global Ecology and Biogeography (under review)
3. Stofferahn, Eric, Fisher, Josha, Hayes, Daniel, Schwalm, Christopher, Huntzinger, Deborah, Hantson, Wouter, Poulter, Ben, **Zhang, Zhen**. The Arctic-Boreal Vulnerability Experiment Model Benchmarking System. Environmental Research Letters. (under review)

4. Barba, Josep, Mark A. Bradford, Paul E. Brewer, Dan Bruhn, Kristofer Covey, Joost van Haren, J. Patrick Megonigal, Mikkelsen, Teis Nørgaard, Pangala, Sunitha R., Pihlatie, Mari, Poulter, Ben, Rivas-Ubach, Albert, Schadt, Christopher W., Terazawa, Kazuhiko, Warner, Daniel L., **Zhang, Zhen**, Vargas, Rodrigo, 2019. Methane Emissions from Tree Stems: A New Frontier in the Global Carbon Cycle. New Phytologist, 222, 1: 18-28.
5. Wang J., Fu X., Ni H., **Zhang Z.**, Li M., 2019. Response of soil respiration to nitrogen deposition on the Sanjiang Plain wetland in northeastern China, PLOS One 14:e0211456.
6. Babst F., Bodesheim P., Charney N., Friend A., Girardin M., Klesse S., Moore D., Seftigen K., Björklund J., Bouriaud O., Dawson A., DeRose R., Dietze M., Eckes A., Enquist B., Frank D., Mahecha M., Poulter B., Record S., Trouel T., Turton R., **Zhang Z.**, Evans M., 2018. When tree rings go global: challenges and opportunities for retro- and prospective insight, Quaternary Science Reviews 197, 1-20.
7. **Zhang, Z.,** Zimmermann, N.E., Calle L., Hurtt G., Chatterjee A., Poulter, B., 2019, Enhanced response of global wetland methane emissions to recent El Niño-Southern Oscillation events, Environmental Research Letter, 13(7):074009.
8. Wang, C., Chen Z., **Zhang Z.**, Tang J., Li J., Brunner I., Zheng X., Zhao T., Geng Z., Li M., 2018. Global patterns of dead and living fine root stocks in forest ecosystems, Journal of Biogeography, 00, 1-17.
9. **Zhang, Z.**, Zimmermann, N.E., Stenke, A., Li, X., Hodson, E.L., Zhu, G., Huang, C., Poulter, B., 2017. Emerging role of wetland methane emissions in driving 21st century climate change, Proceedings of the National Academy of Sciences, 114, 9647-9652.
10. Fisher, J., Hayes, J. D., Schwalm, R. C., Huntzinger, N. D., Stofferahn, E., Schaefer, K., Luo, Y., Wullschleger, D. S., Goetz, S., Miller, E. C., Griffith, P., Chadburn, S., Chatterjee, A., Ciais, P., Douglas, T., Genet, H., Ito, A., Neigh, C., Poulter, B., Rogers, B., Sonnentag, O., Tian, H., Wang, W., Xue, Y., Yang, Z.-L., and Zeng, N., **Zhang, Z.**, 2018. Missing pieces to modeling the Arctic-Boreal puzzle, Environmental Research Letters. 13, 020202.
11. Saunois, M., Bousquet, P., Poulter, B., Peregon, A., Ciais, P., Canadell, J. G., Dlugokencky, E. J., Etiope, G., Bastviken, D., Houweling, S., Janssens-Maenhout, G., Tubiello, F. N., Castaldi, S., Jackson, R. B., Alexe, M., Arora, V. K., Beerling, D. J., Bergamaschi, P., Blake, D. R., Brailsford, G., Bruhwiler, L., Crevoisier, C., Crill, P., Covey, K., Frankenberg, C., Gedney, N., Höglund-Isaksson, L., Ishizawa, M., Ito, A., Joos, F., Kim, H. S., Kleinen, T., Krummel, P., Lamarque, J. F., Langenfelds, R., Locatelli, R., Machida, T., Maksyutov, S., Melton, J. R., Morino, I., Naik, V., O'Doherty, S., Parmentier, F. J. W., Patra,

P. K., Peng, C., Peng, S., Peters, G. P., Pison, I., Prinn, R., Ramonet, M., Riley, W. J., Saito, M., Santini, M., Schroeder, R., Simpson, I. J., Spahni, R., Takizawa, A., Thornton, B. F., Tian, H., Tohjima, Y., Viovy, N., Voulgarakis, A., Weiss, R., Wilton, D. J., Wiltshire, A., Worthy, D., Wunch, D., Xu, X., Yoshida, Y., Zhang, B., **Zhang, Z.**, and Zhu, Q.: Variability and quasi-decadal changes in the methane budget over the period 2000–2012, Atmos. Chem. Phys., 17, 11135-11161, 2017.

12. Poulter, B., Bousquet, P., Canadell, G. J., Ciais, P., Peregon, A., Saunois, M., Arora, K. V., Beerling, J. D., Brovkin, V., Jones, D. C., Joos, F., Gedney, N., Ito, A., Kleinen, T., Koven, D. C., McDonald, K., Melton, R. J., Peng, C., Peng, S., Prigent, C., Schroeder, R., Riley, J. W., Saito, M., Spahni, R., Tian, H., Taylor, L., Viovy, N., Wilton, D., Wiltshire, A., Xu, X., Zhang, B., **Zhang, Z.**, and Zhu, Q., 2017 Global wetland contribution to 2000–2012 atmospheric methane growth rate dynamics, Environmental Research Letters, 12, 094013.
13. **Zhang, Z.**, Babst, F., Bellassen, V., Frank, D., Launois, T., Tan, K., Ciais, P., Poulter, B., 2017. Converging Climate Sensitivities of European Forests Between Observed Radial Tree Growth and Vegetation Models, Ecosystems.
14. Pandey, S., Houweling, S., Krol, M., Aben, I., Monteil, G., Nechita-Banda, N., Dlugokencky, E.J., Detmers, R., Hasekamp, O., Xu, X., Riley, W.J., Poulter, B., **Zhang, Z.**, McDonald, K.C., White, J.W.C., Bousquet, P., Röckmann, T., 2017. Enhanced methane emissions from tropical wetlands during the 2011 La Niña, Scientific Reports 7, 45759.
15. Jin J., Wang Y., **Zhang Z.**, Magliulo V., Jiang H. and Cheng M., 2017. Phenology Plays an Important Role in the Regulation of Terrestrial Ecosystem Water-Use Efficiency in the Northern Hemisphere, Remote Sensing 9, 664.
16. Saunois, M., Bousquet, P., Poulter, B., Peregon, A., Ciais, P., Canadell, J.G., Dlugokencky, E.J., Etiope, G., Bastviken, D., Houweling, S., Janssens-Maenhout, G., Tubiello, F.N., Castaldi, S., Jackson, R.B., Alexe, M., Arora, V.K., Beerling, D.J., Bergamaschi, P., Blake, D.R., Brailsford, G., Brovkin, V., Bruhwiler, L., Crevoisier, C., Crill, P., Covey, K., Curry, C., Frankenberg, C., Gedney, N., Höglund-Isaksson, L., Ishizawa, M., Ito, A., Joos, F., Kim, H.S., Kleinen, T., Krummel, P., Lamarque, J.F., Langenfelds, R., Locatelli, R., Machida, T., Maksyutov, S., McDonald, K.C., Marshall, J., Melton, J.R., Morino, I., Naik, V., O'Doherty, S., Parmentier, F.J.W., Patra, P.K., Peng, C., Peng, S., Peters, G.P., Pison, I., Prigent, C., Prinn, R., Ramonet, M., Riley, W.J., Saito, M., Santini, M., Schroeder, R., Simpson, I.J., Spahni, R., Steele, P., Takizawa, A., Thornton, B.F., Tian, H., Tohjima, Y., Viovy, N., Voulgarakis, A., van Weele, M., van der Werf, G.R., Weiss, R., Wiedinmyer, C., Wilton,

D.J., Wiltshire, A., Worthy, D., Wunch, D., Xu, X., Yoshida, Y., Zhang, B., **Zhang, Z.**, Zhu, Q., 2016. The global methane budget 2000–2012, Earth Syst. Sci. Data 8, 697-751.

17. Xu, X., Riley, W.J., Koven, C.D., Billesbach, D.P., Chang, R.Y.W., Commane, R., Euskirchen, E.S., Hartery, S., Harazono, Y., Iwata, H., McDonald, K.C., Miller, C.E., Oechel, W.C., Poulter, B., Raz-Yaseef, N., Sweeney, C., Torn, M., Wofsy, S.C., **Zhang, Z.**, Zona, D., 2016. A multi-scale comparison of modeled and observed seasonal methane emissions in northern wetlands. Biogeosciences 13, 5043-5056.
18. Lu X., Jiang H., Liu J., Zhang X., Jin J., Zhu Q., **Zhang Z.**, Peng C., 2016. Simulated effects of nitrogen saturation on the global carbon budget using the IBIS model Scientific Reports 6 39173.
19. **Zhang, Z.,** Zimmermann, N.E., Kaplan, J.O., Poulter, B., 2016. Modeling spatiotemporal dynamics of global wetlands: comprehensive evaluation of a new sub-grid TOPMODEL parameterization and uncertainties. Biogeosciences 13, 1387-1408.
20. **Zhang, Z.**, Jiang, H., Liu, J., Zhang, X., Huang, C., Lu, X., Jin, J., Zhou, G., 2014. An analysis of the global spatial variability of column-averaged CO_2 from SCIAMACHY and its implications for CO_2 sources and sinks. International Journal of Remote Sensing 35, 2047-2066.
21. **Zhang, Z.**, Jiang, H., Liu, J., Ju, W., & Zhang, X., 2013. Effect of heterogeneous atmospheric CO_2 on simulated global carbon budget. Global and Planetary Change, 101, 33-51.
22. **Zhang, Z.**, Jiang, H., Liu, J., Han, J., Zhu, Q., & Zhang, X., 2013. Implications of Future Water Use Efficiency for Ecohydrological Responses to Climate Change and Spatial Heterogeneity of Atmospheric CO_2 in China. Terrestrial, Atmospheric & Oceanic Sciences, 24(3).
23. Lu, X., Jiang, H., liu, J., Zhou, G., Zhu, Q., Peng, C., Wei, X., Chang, J., Liu, S., Liu, S., **Zhang, Z.**, Wang, K., Zhang, X., and Solomon, A., 2012. Spatial and Temporal Variability of Nitrogen Deposition and Its Impacts on the Carbon Budget of China, International Journal of Remote Sensing, 13, 1997-2030.
24. **Zhang, Z.**, Jiang, H., Liu, J.X., Zhou, G.M., Liu, S.R., Zhang, X., 2012. Assessment on water use efficiency under climate change and heterogeneous carbon dioxide in China terrestrial ecosystems. Procedia Environmental Sciences, 13, 2031-2044.
25. Zhang X., Jiang, H., Zhou, G., Xiao, Z., and **Zhang, Z.**, Geostatistical interpolation of missing data and downscaling of spatial resolution for remotely sensed atmospheric methane column concentrations, International Journal of Remote Sensing, 33, 120-134, 2011.

26. **Zhang Z.**, Jiang H., Liu J., Zhu Q., Wei X., 2011. Modeling the spatial-temporal dynamics of net primary production in Yangtze River Basin using IBIS model. Geoinformatics, 2011 19th International Conference.
27. **Zhang Z.**, Jiang H., Liu J., 2011. Modeling the spatial–temporal dynamics of water use efficiency in Yangtze River Basin using IBIS model. Acta Ecologica Sinica, 31, 246-253,10.1016/j.chnaes.2011.06.004.