Curriculum Vitae

Qianlai Zhuang
William F. and Patty J. Miller Professor
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Department of Earth, Atmospheric, and Planetary Sciences and Department of Agronomy
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Professional Preparation

- Post-Doc, 2001-2005, The Ecosystems Center of the Marine Biological Laboratory, Woods Hole, MA; Advisor: Dr. Jerry M. Melillo
- Ph.D. Biological Sciences, 1997-2001, University of Alaska at Fairbanks, USA; Advisor: Dr. A. David McGuire
- M.S. Biomathematics and Botany, 1988-1991, Chinese Academy of Sciences, Institute of Botany, Beijing, P.R. China; Advisor: Dr. Kexue Xu

Professional Experience

- 2014-present: Professor of Earth, Atmospheric, and Planetary Sciences, and Professor of Agronomy, Department of Earth, Atmospheric, and Planetary Sciences and Department of Agronomy, Purdue University, West Lafayette, IN
- 2010-2014: William F. and Patty J. Miller Associate Professor of Earth, Atmospheric, and Planetary Sciences, and Associate Professor of Agronomy, Department of Earth, Atmospheric, and Planetary Sciences and Department of Agronomy, Purdue University, West Lafayette, IN
- 2011-2012: Visiting Professor/Scientist at Joint Program on the Science and Policy of Global Change, Massachusetts Institute of Technology, Cambridge, MA
- 2005-2010: Assistant Professor at Department of Earth & Atmospheric Sciences and Department of Agronomy, Purdue University, West Lafayette, IN
- 2001-2005: Post-Doctoral Scientist, the Ecosystems Center of Marine Biological Laboratory (MBL), Woods Hole, and Research Associate at Massachusetts Institute of Technology (MIT), Joint Program on the Science and Policy of Global Change, Cambridge, MA. From January to June of 2005, Research Associate Professor at South Dakota School of Mines and Technology.
- 1997-2001: Research Assistant, Department of Biology and Wildlife, the Institute of Arctic Biology, University of Alaska Fairbanks, AK, USA.

Current and Past Research Grants as PI (Totally raised $15M)

- 11/01/2022 – 10/30/2025, NASA – Role of linked hydrological, permafrost, ground ice, and land cover changes in regional carbon balance across boreal and arctic landscapes. PI in collaboration with USGS (Neal Pastick), UAF (Tamara Harms), and Alaskan Ecoscience (Torre Jorgenson). Award: $913,015
- 08/05/2021- 08/04/2024, NASA - The role of boreal wildfires in the global carbon budget: A process-based analysis using satellite-derived fire burn severity data, (PI in collaboration with Nancy French at Michigan Tech. and Ron Prinn at MIT), Award: $675,583
- 9/1/2022 – 8/31/2024, Federal Aviation Administration, Direct and indirect land use change emissions due to SAF and PTL Pathways: Data and model improvements and role of soil organic

carbon, CoPI in collaboration with Taheripour, Farzad; van der Mensbrugghe, Dominique; Armstrong, Shalamar; Singh, Shweta; Corong, Erwin; Chepeliev, Maksym; Lusk, Jayson, Award Amount: $789,688

- 08/1/2018- 07/30/2023, NSF - Collaborative Research: MSB-FRA: Peat Expansion in Arctic Tundra - Pattern, Process, and the Implication for the Carbon Cycle (TundraPEAT) (Award # 1802832, PI in collaboration with Julie Loisel, Texas A&M University; Philip Camill, Bowdoin College; Steve Frolking, University of New Hampshire; Zicheng Yu, Lehigh University), $304,493.
- 07/1/2017- 06/30/2020NASA/U. of Colorado, Boulder, Process-level investigation of revised global methane budget based on in situ and remote sensing of atmospheric composition and the land surface (PI in collaboration with Stefan Schwietzke, Sourish Basu; Lori Bruhwiler; Owen Sherwood; John Miller; Gabrielle Petron; Sylvia Englund Michel; Ed Dlugokencky; Pieter Tans; Giuseppe Etiope; Martin Schoell; Bell, Jennifer) $468,997 out of $1,282,569
- 91/2017-8/31/2020NASA Earth and Space Science Fellowship, High Affinity Methanotrophs are an Important Overlooked Methane Sink in the Pan-Arctic Methane Budget (PI for Youmi Oh) $135,000
- 07/10/2017 - 07/09/2019USGS, Quantifying Alaskan Landscape Changes and Their Impacts on Greenhouse Emissions of Carbon Dioxide and Methane (PI in collaboration with A. D. McGuire and H. Genet) $140,000
- 07/01/2016 – 06/30/2019, NASA/JPL: Dynamic inundation mapping for boreal methane studies on seasonal to inter-seasonal scales (PI in collaboration with Seungbum Kim at JPL), $152,909.
- 08/01/2015-07/31/2018, Department of Energy / Chapman University: Understanding mechanistic controls of heterotrophic CO2 and CH4 fluxes in a peatland with deep soil warming and atmospheric CO2 enrichment (PI in collaboration with Scott Bridgham and Jason Keller), $416,551
- 04/2014-05/2017, NASA - Regional and Global Climate and Societal Impacts of Land-Use and Land-Cover Change in Northern Eurasia: A Synthesis Study Using Remote Sensing Data and an Integrated Global System Model (Lead PI in collaboration with J. Reilly at MIT and J. Melillo at MBL), $ 855,934.
- 02/14/2014 - 02/13/2017, NSF-Ecosystem Program. Collaborative Research: Forest productivity and hydrological patterns regulate methane fluxes from peatlands in the Amazon basin (PI in collaboration with Cadillo-Quiroz, Hinsby), $120,000.
- 11/2013-11/2015, USGS - Assessing Wetland Methane Emissions in Alaska (PI), $ 156,159.
- 08/2012-07/2015, Department of Energy / U. of Oregon, Understanding the Mechanisms Underlying Heterotrophic CO2 and CH4 Fluxes in a Peatland with Deep Soil Warming and Atmospheric CO2 Enrichment (PI in collaboration with Scott Bridgham and Jason Keller), $124,370
- 09/2011-08/2014, Department of Energy, Collaborative Research: Quantifying Climate Feedbacks of the Terrestrial Biosphere under Thawing Permafrost Conditions in the Arctic (Lead PI in collaboration with C. A. Schlosser at MIT, J. M. Melillo at MBL, Woods Hole MA, and K. Anthony Walter at UAF), $540,000 out of $1,620,000
- 08/2009-07/2012, NSF - Collaborative Research: CDI-II: A Paradigm Shift in Ecosystem and Environmental Modeling: An Integrated Stochastic, Deterministic, and Machine Learning Approach (Lead PI in collaboration with M. Crawford, H. Zhang, J. Zhang, D. Xiu, J. Melillo, J. Reilly, D. Kicklighter), $1,600,004 out of $2,000,000.
- 08/2009-07/2012, NSF - Collaborative Research: Impacts of Climate Seasonality on Carbon Accumulation and Methane Emissions of Alaskan Ecosystems during the Holocene Thermal Maximum (PI in collaboration with Z. Yu, B. Felzer, and M. Jones), $202,916 out of $602,384.

• 04/2009-04/2012, NASA Land-use and Land-cover Program - Changes of Land Cover and Land Use and Greenhouse Gas Emissions in Northern Eurasia: Impacts on Human Adaptation and Quality of Life at Regional and Global Scales (Lead PI in collaboration with J. M. Melillo, D. Kicklighter, J. Reilly, A. Shvidenko, N. Tchebakova, E. Parfenova, A. Peregon, A. Sirin, S. Maksyutov, and G. Zhou), $824,701

• 09/2008 -08/1013, Department of Energy / Lawrence Berkeley National Laboratory – Investigation of the Magnitudes and Probabilities of Abrupt Climate Transitions (IMPACTS) (PI in collaboration with Bill Riley, Mac Post, and Margaret Torn), $75,000

• 10. 07/2008-07/2011, Department of Energy - Quantifying Climate Feedbacks From Abrupt Changes in High-Latitude Trace-Gas Emissions (PI in collaboration with A. Schlosser, J. Melillo, K. Walter), $89,999 out of $560,000

• 01/2008-05/2009, Office of the President of Purdue University, Visiting Indian and Chinese Scholars (VICS) grant, $10,000

• 09/2007-09/2010, Department of Energy - Analysis of global economic and environmental impacts of a substantial increase in bioenergy production (PI in collaboration with Wally Tyner and Tom Hertel), $209,900 out of $659,783.

• 09/2007-09/2010, NASA Earth System Science Fellowship: Improving a process-based biogeochemistry model using an atmospheric transport chemistry model and in-situ and remotely-sensed terrestrial and atmospheric data (PI) for Mr. Jinyun Tang, $84,000

• 01/2007-12/2011, NSF - Collaborative Research: Impact of Permafrost Degradation on Carbon and Water in Boreal Ecosystems (Lead PI with Jennifer Harden, Robert Striegl, Yuri Shur, and Torre Jorgenson), $756,578 out of $1,693,883.

• 01/2007-12/2007, The Energy Center, Discovery Park, Purdue University - Global Biomass and Bioenergy Supply in a Coupled Natural and Human System (Lead PI with Wally Tyner), $50,000.

• 01/2007-12/2007, The Center for Environment, Purdue University - Quantifying Carbon Sequestrations across Indiana's Forest Landscapes (PI in collaboration with Guofan Shao, Phillip Pope, Charles Michler, Melba Crawford), $30,000.

• 01/2006-01/2009, NSF - National Center for Ecological Analysis and Synthesis. Toward an adequate quantification of CH4 emissions form land ecosystems: Integrating field and in- situ observations, satellite data, and modeling (Lead PI with Jerry Melillo, Ron Prinn, and Dave McGuire), $103,350.

• 08/2005-09/2009, NSF - Collaborative Research: synthesis of Artic system carbon cycle research through model-data fusion studies using atmospheric inversion and process-based approaches (PI in collaboration with Dave McGuire, Jerry Melillo, and Michael Follows). $245,883 out of $1,179,591.

Refereed publication (Underlines indicate post-docs or students: 232; H-index=62, i-10 index= 186)

* = Primary author Bold = candidate underlined = Student author P = Post-doc

(233) Guo, M., Melack, J. M., Zhou, W., Barbosa, P. M., Amaral, J. H. F., & **Zhuang, Q.** (2023). Linking biogeochemical and hydrodynamic processes to model methane fluxes in shallow, tropical floodplain lakes. *Journal of Advances in Modeling Earth Systems*, 15, e2022MS003385. https://doi.org/10.1029/2022MS003385

(232) Mu, C., Mo, X., Qiao, Y., Chen, Y., Wei, Y., Mu, M., Song, J., Li, Z., Zhang, W., Peng, X., Zhang, G., **Zhuang, Q**., Aurela, M. (2023). Ecosystem CO2 exchange and its economic implications

in northern permafrost regions in the 21st century. *Global Biogeochemical Cycles*, 37, e2023GB007750. https://doi.org/10.1029/2023GB007750

(231) Zhen Zhang, Sheel Bansal, Kuang-Yu Chang, Etienne Fluet-Chouinard, Kyle Delwiche, Mathias Goeckede, Adrian Gustafson, Sara Knox, Antti Leppänen, Licheng Liu, Jinxun Liu, Avni Malhotra, Tiina Markkanen, Gavin McNicol, Joe R. Melton, Paul A. Miller, Changhui Peng, Maarit Raivonen, William J. Riley, Oliver Sonnentag, Tuula Aalto, Rodrigo Vargas, Wenxin Zhang, Qing Zhu, Qiuan Zhu, **Qianlai Zhuang**, Lisamarie Windham-Myers, Robert B. Jackson, Benjamin Poulter (2023). Characterizing performance of freshwater wetland methane models across time scales at FLUXNET-CH4 sites using wavelet analyses. *Journal of Geophysical Research: Biogeosciences*, 128, e2022JG007259. https://doi.org/10.1029/2022JG007259

(230) Wang, Shuai., X. Zhang, K. Adhikari, B. Roland, **Q. Zhuang**, Z. Wang, D. Shi, X. Jin, F. Qian, Predicting soil organic carbon stocks under future land use and climate change conditions in Northeast China, *Environmental Impact Assessment Review*, Volume 103, 2023, 107278, ISSN 0195-9255, https://doi.org/10.1016/j.eiar.2023.107278.

(229) Wang, S., X. Zhang, K. Adhikari, B. Roland, **Q. Zhuang**, Z. Wang, D. Shi, X. Jin, F. Qian, Predicting soil organic carbon stocks under future land use and climate change conditions in Northeast China, *Environmental Impact Assessment Review*, Volume 103, 2023, 107278, ISSN 0195-9255, https://doi.org/10.1016/j.eiar.2023.107278

(228) Ito, A., Li, T., Qin, Z., Melton, J. R., Tian, H., Kleinen, T., W. Zhang, Z. Zhang, F. Joos, P. Ciais, P. O. Hopcroft, D. J. Beerling, X. Liu, **Q. Zhuang**, Q. Zhu, C. Peng, K.-Y. Chang, E. Fluet-Chouinard, G. McNicol, P. Patra, B. Poulter, S. Sitch, W. Riley, Q. Zhu (2023). Cold-season methane fluxes simulated by GCP-CH4 models. *Geophysical Research Letters*, 50, e2023GL103037. https://doi.org/10.1029/2023GL103037

(227) Xi, X., **Zhuang, Q***., Kim, S., & Zhang, Z. (2023). Methane emissions from land and aquatic ecosystems in Western Siberia: An analysis with methane biogeochemistry models. *Journal of Geophysical Research: Biogeosciences*, 128, e2023JG007466. https://doi.org/10.1029/2023JG007466 PDF

(226) Jaehyun Lee, J., Y. Oh, S. T. Lee, Y. O. Seo, J. Yun, Y. Yang, J. Kim, **Q. Zhuang** & H. Kang, Soil organic carbon is a key determinant of CH4 sink in global forest soils. *Nat Commun* 14, 3110 (2023). https://doi.org/10.1038/s41467-023-38905-8

(225) Wang, S., Zicheng Wang, **Q. Zhuang,** Kabindra Adhikari, Roland Bol, Yan Wang, Xingyu Zhang, Xinxin Jin, Fengkui Qian, Assessing the carbon sequestration potential and identifying influential factors of cultivated soils in Northeast China, *Geoderma Regional*, 2023, e00655, ISSN 2352-0094, https://doi.org/10.1016/j.geodrs.2023.e00655.

(224) Chang, K.-Y., Riley, W. J., Collier, N., McNicol, G., Fluet-Chouinard, E., Knox, S. H., Delwiche, K. B., Jackson, R. B., Poulter, B., Saunois, M., Chandra, N., Gedney, N., Ishizawa, M., Ito, A., Joos, F., Kleinen, T., Maggi, F., McNorton, J., Melton, J. R. … **Zhuang, Q.** (2023). Observational constraints reduce model spread but not uncertainty in global wetland methane emission estimates. *Global Change Biology*, 00, 1– 15. https://doi.org/10.1111/gcb.16755

(223) Xi, X., Zhuang, Q*, Kim, S., & Gentine, P. (2023). Evaluating the effects of precipitation and evapotranspiration on soil moisture variability within CMIP5 using SMAP and ERA5 data. *Water Resources Research*, 59, e2022WR034225. https://doi.org/10.1029/2022WR034225

(222) Liu, X. and **Zhuang, Q*.**: Methane emissions from Arctic landscapes during 2000–2015: an analysis with land and lake biogeochemistry models, *Biogeosciences*, 20, 1181–1193, https://doi.org/10.5194/bg-20-1181-2023, 2023.

(221) **Zhuang, Q**., Guo, M., Melack, J. M., Lan, X., Tan, Z., Oh, Y., & Leung, L. R. (2023). Current and future global lake methane emissions: A process-based modeling analysis. *Journal of Geophysical Research: Biogeosciences*, 128, e2022JG007137. https://doi.org/10.1029/2022JG007137/acc1f7

(220) Xu, Y. and **Q. Zhuang*** (2023), The importance of interactions between snow, permafrost and vegetation dynamics in affecting terrestrial carbon balance in circumpolar regions, *Environ. Res. Lett.* 18 044007, DOI 10.1088/1748-9326/acc1f7

(219) Wang, Shuai, Bol Roland, Kabindra Adhikari, **Q. Zhuang**, Xinxin Jin, Chunlan Han, Fengkui Qian, Spatial-temporal variations and driving factors of soil organic carbon in forest ecosystems of Northeast China, *Forest Ecosystems*, Volume 10, 2023, 100101, ISSN 2197-5620

(218) Zhao, B. and **Zhuang, Q*.**: Peatlands and their carbon dynamics in northern high latitudes from 1990 to 2300: a process-based biogeochemistry model analysis, *Biogeosciences*, 20, 251–270, https://doi.org/10.5194/bg-20-251-2023, 2023.

(217) Oh, Y., **Zhuang, Q***., Welp, L.R. et al. Improved global wetland carbon isotopic signatures support post-2006 microbial methane emission increase. *Commun Earth Environ* 3, 159 (2022). https://doi.org/10.1038/s43247-022-00488-5

(216) Wang, S., **Q. Zhuang**, M. Zhou, X. Jin, N. Yu, T. Yuan, Temporal and spatial changes in soil organic carbon and soil inorganic carbon stocks in the semi-arid area of northeast China, *Ecological Indicators*, Volume 146, 2023, 109776, ISSN 1470-160X, https://doi.org/10.1016/j.ecolind.2022.109776.

(215) Wu, T., Wu, Q., **Zhuang, Q**. et al. Optimal Sample Size for SOC Content Prediction for Mapping Using the Random Forest in Cropland in Northern Jiangsu, China. *Eurasian Soil Sc*. 55, 1689–1699 (2022). https://doi.org/10.1134/S1064229322600816

(214) Kou, D. Tarmo Virtanen, Claire C. Treat, Juha-Pekka Tuovinen, Aleksi Räsänen, Sari Juutinen, Juha Mikola, Mika Aurela, Lauri Heiskanen, Maija Heikkilä, Jan Weckström, Teemu Juselius, Sanna R. Piilo, Jia Deng, Yu Zhang, Nitin Chaudhary, Conghong Huang, Minna Väliranta, Christina Biasi, Xiangyu Liu, Mingyang Guo, **Q. Zhuang**, Atte Korhola, Narasinha J. Shurpali (2022). Peatland heterogeneity impacts on regional carbon flux and its radiative effect within a boreal landscape. *Journal of Geophysical Research: Biogeosciences*, 127, e2021JG006774. https://doi.org/10.1029/2021JG006774

(213) Huang, C., **Zhuang, Q**., Meng, X. et al. A fine spatial resolution modeling of urban carbon emissions: a case study of Shanghai, China. *Sci Rep* 12, 9255 (2022). https://doi.org/10.1038/s41598-022-13487-5

(212) Zhao, B., **Zhuang, Q*.,** Treat, C., & Frolking, S. (2022). A model intercomparison analysis for controls on C accumulation in North American peatlands. *Journal of Geophysical Research: Biogeosciences*, 127, e2021JG006762. https://doi.org/10.1029/2021JG006762

(211) Liu, X.; Wang, S.; **Zhuang, Q**.; Jin, X.; Bian, Z.; Zhou, M.; Meng, Z.; Han, C.; Guo, X.; Jin, W.; et al. A Review on Carbon Source and Sink in Arable Land Ecosystems. *Land* 2022, 11, 580. https://doi.org/10.3390/land11040580

(210) Xi, X., Gentine, P., **Zhuang, Q*.,** & Kim, S. (2022). Evaluating the variability of surface soil moisture simulated within CMIP5 using SMAP data. *Journal of Geophysical Research: Atmospheres*, 127, e2021JD035363. https://doi.org/10.1029/2021JD035363

(209) Liu, L., **Zhuang, Q**., Zhao, D., Zheng, D., Kou, D., & Yang, Y. (2022). Permafrost degradation diminishes terrestrial ecosystem carbon sequestration capacity on the Qinghai- Tibetan plateau. *Global Biogeochemical Cycles,* 36, e2021GB007068. https://doi.org/10.1029/2021GB007068

(208) [P]Zhang, L., **Q. Zhuang**, Zhi Wen, Peng Zhang, Wei Ma, Qingbai Wu, Hanbo Yun, Spatial state distribution and phase transition of non-uniform water in soils: Implications for engineering and environmental sciences, *Advances in Colloid and Interface Science*, 2021, 102465, ISSN 0001-8686, https://doi.org/10.1016/j.cis.2021.102465.

(207) [P]Wang, S., M. Zhou, K. Adhikari, **Q. Zhuang**, Z. Bian, Y. Wang, X. Jin, Anthropogenic controls over soil organic carbon distribution from the cultivated lands in Northeast China, *CATENA*, Volume 210, 2022, 105897, ISSN 0341-8162, https://doi.org/10.1016/j.catena.2021.105897.

(206) Yun, H., J. Tang, L. D'Imperio, X. Wang, Y. Qu, L. Liu, **Q. Zhuang**, W. Zhang, Q. Wu, A. Chen, Q. Zhu, D. Chen, B. Elberling (2021). Warming and increased respiration have transformed an alpine steppe ecosystem on the Tibetan Plateau from a carbon dioxide sink into a source. *Journal of Geophysical Research: Biogeosciences*, 126, e2021JG006406. https://doi.org/10.1029/2021JG006406

(205) Zha, J. and **Zhuang, Q*.:** Quantifying the role of moss in terrestrial ecosystem carbon dynamics in northern high latitudes, *Biogeosciences*, 18, 6245–6269, https://doi.org/10.5194/bg-18-6245-2021, 2021.

(204) Stavert, A. R., Saunois, M., Canadell, J. G., Poulter, B., Jackson, R. B., Regnier, P., Lauerwald, R., Raymond, P. A., Allen, G. H., Patra, P. K., Bergamaschi, P., Bousquet, P., Chandra, N., Ciais, P., Gustafson, A., Ishizawa, M., Ito, A., Kleinen, T., Maksyutov, S., … **Zhuang, Q.** (2021). Regional trends and drivers of the global methane budget. *Global Change Biology*, 00, 1– 19. https://doi.org/10.1111/gcb.15901

(203) Zhang, L., T. Ren, Y. Yu, Y. Yao, C. Li, Y. Zhao, **Q. Zhuang**, Z. Liu, X. Zhang, S. Li, Optimization of environmental variable functions of GPP quantitative model based on SCE-UA and minimum loss screening method, *Ecological Informatics*, Volume 66, 2021, 101479, ISSN 1574-9541, https://doi.org/10.1016/j.ecoinf.2021.101479.

(202) Liu, S., and **Zhuang, Q*.** 2021. Leaf 13C data constrain the uncertainty of the carbon dynamics of temperate forest ecosystems. *Ecosphere* 12(10):e03741. 10.1002/ecs2.3741

(201) [P]Wang, S.; Zhou, M.; **Zhuang, Q.;** Guo, L. Prediction Potential of Remote Sensing- Related Variables in the Topsoil Organic Carbon Density of Liaohekou Coastal Wetlands, Northeast China. *Remote Sens.* 2021, 13, 4106. https://doi.org/10.3390/rs13204106

(200) Liu, X., **Q. Zhuang**, L. Lai, J. Zhou, Q. Sun, S. Yi, B. Liu, Y. Zheng, Soil water use sources and patterns in shrub encroachment in semiarid grasslands of Inner Mongolia, *Agricultural and Forest Meteorology*, Volumes 308–309, 2021, 108579, ISSN 0168-1923, https://doi.org/10.1016/j.agrformet.2021.108579.

(199) Guo, M., **Zhuang, Q*.,** Yao, H., Golub, M., Leung, L. R., & Tan, Z. (2021). Intercomparison of thermal regime algorithms in 1-D lake models. *Water Resources Research*, 57, e2020WR028776. https://doi.org/10.1029/2020WR028776

(198) Lan, X., Basu, S., Schwietzke, S., Bruhwiler, L. M. P., Dlugokencky, E. J., Michel, S. E., O. A. Sherwood, P. P. Tans, K. Thoning, G. Etiope, **Zhuang, Q.** L. Liu, Y. Oh, J. B. Miller, G. Pétron, B. H. Vaughn, M. Crippa (2021). Improved constraints on global methane emissions and sinks using δ13C-CH4. *Global Biogeochemical Cycles*, 35, e2021GB007000. https://doi. org/10.1029/2021GB007000

(197) Zhao, B., **Q. Zhuang***, N. Shurpali, K. Köster, F. Berninger & J. Pumpanen, North American boreal forests are a large carbon source due to wildfires from 1986 to 2016, *Scientific Reports*, (2021) 11:7723, https://doi.org/10.1038/s41598-021-87343-3

(196) Huang, C., **Q. Zhuang**, X. Meng, H. Guo, J. Han, An improved nightlight threshold method for revealing the spatiotemporal dynamics and driving forces of urban expansion in China, *Journal of Environmental Management* 289 (2021) 1125740301-4797

(195) **Zhuang, Q*.,** Wang, S., Zhao, B., Aires, F., Prigent, C., Yu, Z., et al. (2020). Modeling Holocene peatland carbon accumulation in North America. *Journal of Geophysical Research: Biogeosciences*, 125, e2019JG005230. https://doi.org/10.1029/2019JG005230 . PDF.

(194) Liu, L., D. Zhao, J. Wei, **Q. Zhuang**, X. Gao, Y. Zhu, J. Zhang, C. Guo and D. Zheng, (2021) Permafrost sensitivity to global warming of 1.5°C and 2°C in the Northern Hemisphere, *Environmental Research Letters*, https://doi.org/10.1088/1748-9326/abd6a8.

(193) Zheng, J., J. Fan, F. Zhang, J. Guo, S. Yan, **Q. Zhuang**, N. Cui, L. Guo (2021), Interactive effects of mulching practice and nitrogen rate on grain yield, water productivity, fertilizer use efficiency and greenhouse gas emissions of rainfed summer maize in northwest China, *Agricultural Water Management,* Volume 248, 106778, ISSN 0378-3774, https://doi.org/10.1016/j.agwat.2021.106778.

(192) Guo, M., ***Zhuang, Q.,** Yao, H., Golub, M., Leung, L. R., Pierson, D., & Tan, Z. (2021). Validation and sensitivity analysis of a 1-D lake model across global lakes. *Journal of Geophysical Research: Atmospheres*, 126, e2020JD033417. https://doi.org/10.1029/2020JD033417.

(191) Zheng, J., J. Fan, F. Zhang, **Q. Zhuang**. 2021. Evapotranspiration partitioning and water productivity of rainfed maize under contrasting mulching conditions in Northwest. *Agricultural Water Management*.243:106473

(190) Wang, S., L. Xu, **Q. Zhuang**, et al., Investigating the spatio-temporal variability of soil organic carbon stocks in different ecosystems, *Science of the Total Environment*, https://doi.org/10.1016/j.scitotenv.2020.143644.

(189) **Zhuang, Q.,** Wang, S., Zhao, B., Aires, F., Prigent, C., Yu, Z., et al. (2020). Modeling Holocene peatland carbon accumulation in North America. *Journal of Geophysical Research: Biogeosciences*, 125, e2019JG005230. https://doi.org/10.1029/2019JG005230.

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(5) Felzer B., D. Kicklighter, J. Melillo, C. Wang**, Q. Zhuang,** and R. Prinn (2004), Ozone effects on net primary production and carbon sequestration in the conterminous United States using a Biogeochemistry Model. T*ellus* 56B, 230-248.

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Verbyla, and **Q. Zhuang** (2004) Land cover disturbances and feedbacks to the climate system in Canada and Alaska. In: Land Change Science: Observing, Monitoring, and Understanding Trajectories of Change on the Earth's Surface (eds. Gutman G., Janetos A.C., Justice C.O, Moran E.F., Mustard J.F., Rindfuss R.R., Skole D., Turner II B.L., Cochrane, M.A.), pp. 139-161. Kluwer Adademic Publishers, Dordrecht, Netherlands.\

(3) **Zhuang, Q**., A. D. McGuire, J. M. Melillo, J. S. Clein, R. J. Dargaville, D. W. Kicklighter, R. B. Myneni, J. Dong, V. E. Romanovsky, J. Harden, and J. E. Hobbie (2003), Carbon cycling in extratropical terrestrial ecosystems of the Northern Hemisphere during the 20th Century: A modeling analysis of the influences of soil thermal dynamics, *Tellus*, 55B, 751- 776.

(2) **Zhuang, Q.**, A. D. McGuire, K. P. O'Neill, J. W. Harden, V. E. Romanovsky, J. Yarie (2002). Modeling the soil thermal and carbon dynamics of a fire chronosequence in Interior Alaska, *J. Geophy. Res.*, 107, 8147, doi:10.1029/2001JD001244. [Printed 108(D1), 2003]

(1) **Zhuang, Q**., V. E. Romanovsky, A. D. McGuire (2001) Incorporation of a permafrost model into a large-scale ecosystem model: Evaluation of temporal and spatial scaling issues in simulating soil thermal dynamics, *J. Geophys. Res.*, 106, D24, 33,649-33,670.

Professional Honors and Awards:

(1) U.S. Fulbright Scholar (2018-2019)
(2) University Faculty Scholar (2015-2020)
(3) Executive Committee Member of the Purdue Climate Research Center
(4) Graduate Student Mentoring Award, College of Sciences at Purdue, 2013
(5) Seed for Success Award (Given in recognition of the accomplishments of single investigators and teams of investigators for their efforts in obtaining a $1 million or more research grant at Purdue), 2011.
(6) Named as William F. and Patty J. Miller Associate and Full Professor of Earth & Atmospheric Sciences at Purdue, 2010-2016
(7) Award of the Excellence (First Place) of Advances of Science and Technology of China for the project "The Scientific Database and Management Systems", Beijing, P. R. China, 1997.

Course Teaching:

(1) Modeling of Biological Systems, Spring 2001 (Guest Lecturer) at University of Alaska Fairbanks
(2) EAS191 Freshman seminar in EAS (Spring, 2008) at Purdue University.
(3) EAS591A, Topics in Climate Change (Fall, 2008) at Purdue University
(4) EAPS 591: Integrated Global System Modeling (Fall, 2016, 2017) at Purdue University
(5) EAPS 120: Introduction to Geography, offer every semester at Purdue University
(6) EAPS 591: Environmental data-model assimilation (Fall, 2021) at Purdue University
(7) EAPS 529, Modeling Ecosystems and Biogeochemical Cycles, offer every other Fall semester at Purdue
(8) EAPS 527, Principles of Ecosystems Ecology, offer every other Spring semester at Purdue

Advising Students and Post-docs

Current Graduate Students (Total 7):

1) Xuan Xi (PhD, Fall 2020 -)
2) Yiming Xu (PhD, Fall 2021-)

3) Ye Yuan (PhD, Fall 2021 -)
4) Xiangyu Liu (PhD, Fall 2021 -)
5) Anshu Siwach (PhD, Fall 2023-)
6) Shuo Chen (PhD, Fall 2023-)
7) Zijia Wang (PhD, Spring 2024-)

Graduated Students (32 PhD and 7 MS)

(1) Yueyang Jiang (MS, 0/2009)
Thesis: Wildfire Regimes in Northern North America Placement: Continue PhD program at Purdue University

(2) Jinyun Tang (PhD, 05/2011)
Dissertation title: Improving a process-based biogeochemistry model using an atmospheric transport chemistry model and in-situ and remotely-sensed terrestrial and atmospheric data Placement: Employed as Post-Doctoral Scientist at Lawrence Berkeley National Laboratory,
Berkeley, CA

(3) Yueyang Jiang (PhD, 05/2012)
Dissertation title: Modeling permafrost impacts on vegetation and carbon dynamics in northern high latitudes
Placement: Employed as Post-Doctoral Scientist at the Ecosystems Center, Marine Biological Laboratory at Woods Hole MA

(4) Xiaoliang Lu (PhD, 05/2012)
Dissertation title: Evaluating impacts of land cover change and permafrost and hydrological dynamics on greenhouse gas emissions and carbon lateral transport in the Yukon River Basin of Alaska
Placement: Employed as Post-Doctoral Scientist at the Ecosystems Center, Marine Biological Laboratory at Woods Hole MA

(5) Zhiwei Zhang (MS, 05/2012)
Thesis title: Modeling Carbon Dynamics of the terrestrial ecosystems in Northern Eurasia during the 21st Century
Placement: Seeking private sector position.

(6) Xinhua Sui (PhD at Chinese Academy of Sciences, Beijing, Spring 2009 – Fall, 2012)
Dissertation: Sensitivity and uncertainty analysis of carbon budget of Chinese temperate steppe Ecosystem
Placement: Research Scientist at Sun Yat-sen University / South China Botanical Garden, Chinese Academy of Sciences.

(7) Yujie He (MS, 12/2012)
Thesis title: Alternative ways of using experimental data to calibrate ecosystem models and implications for carbon cycle studies
Placement: Continue PhD program at Purdue

(8) Min Chen (PhD, 05/2013)
Dissertation title: Modeling the effects of atmospheric ozone and aerosol on global ecosystem carbon dynamics

Placement: Employed as Post-Doctoral Scientist at Harvard University, Cambridge MA

(9) Lulu Song (PhD at Chinese Academy of Sciences, July/2013) Dissertation title: Modeling the evapotranspiration on Tibetan Plateau Placement: Chinese Academy of Sciences

(10) Linyuan Shang (08/2011 – 08/2013)
Thesis title: Improving leaf phenology simulations using satellite data and model-data assimilation approach in the conterminous US
Placement: Seeking research or technical position

(11) Zhangcai Qin (PhD, 12/2013)
Dissertation title: Quantifying Crop Yield, Bioenergy Production, and Greenhouse Gas Emissions from Cropland and Marginal Land Using a Model-Data Fusion Approaches Placement: Post-Doctoral Scientist at Argonne National Laboratory

(12) Qing Zhu (PhD, 5/2014)
Dissertation title: "Improving Quantification of Regional Net Carbon Exchanges between the Terrestrial Ecosystems and Atmosphere with Models of Process-Based Biogeochemistry and Atmospheric Transport Chemistry and in situ Carbon Flux and Satellite Atmospheric CO2 Data
Placement: Post-doc at Lawrence Berkeley National Laboratory

(13) Xudong Zhu (PhD, 5/2014)
Dissertation title: Modeling land-atmospheric exchange of greenhouse gases in natural terrestrial ecosystems in northern high latitudes
Placement: Post-doc at Lawrence Berkeley National Laboratory

(14) Yaling Liu (PhD, 12/2014)
Dissertation: Quantifying Water and Carbon Dynamics in Northern Eurasia during the 20th and 21st Centuries
Placement: Post-doc at Pacific Northwest National Laboratory (PNNL)

(15) Yujie He (PhD, 12/2014)
Dissertation: Modeling ecosystem carbon dynamics with various complexities of soil carbon decomposition processes
Placement: Post-doctoral Scientist at University of California - Irvine

(16) Guangcun Hao (PhD, 05/2015)
Dissertation: Modeling the Response of Soil Heterotrophic Respiration to Climate Scenario Using Process-Based Models
Placement: Assistant Scientist at Southern China Botanical Garden, the Chinese Academy of Sciences

(17) Tong Yu (MS, 12/2015)
Thesis: Modeling global N2O emissions from natural ecosystems using an process-based biogeochemistry model
Placement: Continuing PhD at Purdue

(18) Zhou Lyu (MS, 12/2015)
Thesis: The role of snow in affecting soil thermal dynamics Placement: Continuing PhD at Purdue

(19) Zeli Tan (PhD, 12/2015)
Dissertation: Quantifying terrestrial and aquatic ecosystem methane emissions with process- based biogeochemistry and atmospheric transport and chemistry models
Placement: Post-Doctoral Scientist at the Pacific Northwest National Laboratory (PNNL)

20) Zhenong Jin (PhD, 05/2016)
Dissertation: Quantifying extreme climate events on crop physiological responses and yields in the United States
Placement: Post-Doctoral Scientist at Stanford University

21) Shaoqing Liu (PhD, 12/2016)
Dissertation: Quantifying terrestrial ecosystem carbon dynamics with mechanistically- based biogeochemistry models and in situ and remotely sensed data
Placement: Post-Doctoral Scientist at University of Minnesota

22) Chang Liao (PhD, 05/2017)

Dissertation: Three-Dimensional Water and Carbon Cycle Modeling at High Spatial-Temporal Resolutions
Placement: Post-doc Scientist at Northwest Pacific National Lab

23) Tong Yu (PhD, 5/2018)
Dissertation: Quantifying Nitrogen Fixation and Nitrous Oxide Emissions in Global Natural Terrestrial Ecosystems Using Trait-Based Biogeochemistry Models
Placement: Employed as Data Scientist in Inspur

24) Peng Zhu (PhD, 5/2018)
Dissertation: Climate Mitigation and Adaptation in US Agricultural System Placement: Post-doctoral Scientist at University of California at San Diego.

25) Yang Qu (PhD, 5/2018)
Dissertation: Quantifying Carbon and Water Dynamics Of Terrestrial Ecosystems At High Temporal And Spatial Resolutions Using Process-Based Biogeochemistry Models And In Situ And Satellite Data
Placement: Post-doctoral Scientist at University of Illinois at Urbana-Champaign.

26) Zhou Lyu (PhD, 8/2018)
Dissertation: Quantifying Arctic Terrestrial Ecosystem Carbon Dynamics Using Mechanistically-Based Biogeochemistry Models and In Situ and Satellite Data
Placement: Employed as Post-Doctoral Scientist at Lawrence Berkeley National Lab.

27) Shuai Wang (PhD, 6/2018)
Dissertation: Spatial Distribution Characteristics and Predictive Mapping of Key Soil Properties in the Middle Reaches of the Heihe River Basin
Placement: Assistant Professor at Shenyang Agricultural University

28) Sirui Wang (PhD, 5/2019)
Dissertation: Quantifying Peatland Carbon Dynamics Using Mechanistically-Based Biogeochemistry Models
Placement: Paypal

29) Junrong Zha (PhD, 8/2019)
Dissertation: Modeling the Impacts of Changes in Soil Microbes and Mosses on Arctic Terrestrial Ecosystem Carbon Dynamics.
Placement: IBM

30) Weiwei Li (PhD, 7/2019): Joint with Northwest A&F University
Dissertation: Effects of ridge–furrow mulching on soil CO2 efflux in a maize field in the Chinese Loess Plateau
Placement: Post-doctoral Scientist at Nanjing Agricultural University

31) Licheng Liu (PhD, Fall, 2014 - Spring, 2020)
Dissertation: quantifying global exchanges of methane and carbon monoxide between Terrestrial ecosystems and the atmosphere using process-based biogeochemistry Models
Placement: Post-doctoral Scientist at University of Minnesota

32) Youmi Oh (PhD, Co-advise with Prof. Lisa Welp, Fall 2016- Spring 2020)
Dissertation: quantifying carbon fluxes and isotopic signature changes across global terrestrial ecosystems
Placement: Post-Doctoral Scientist at NOAA

33) Cheng Huang (PhD, with CSC Scholarship, Fall 2017 – Fall 2020): Joint with Eastern China Normal University
Placement: Assistant Professor at Jiangxi Agricultural University

34) Yuan Yao (MS, 2021) Joint with China Agricultural University
Thesis: Optimization of environmental variable functions of GPP quantitative model based on SCE-UA and minimum loss screening method
Placement: Scientist at Chinese Academy of Sciences

35) Yimin Ding (PhD, with CSC Scholarship, Fall 2017 – Fall Spring 2020): Joint with Hohai University

36) Jing Zheng (PhD, with CSC Scholarship, 11/2019 –Spring, 2021)
Dissertation: Evapotranspiration partitioning and water productivity of rainfed maize under contrasting mulching conditions in Northwest China
Placement: Research Scientist at Institute of Mountain Hazards and Environment, Chinese Academy of Sciences.

37) Mingyang Guo (PhD, Fall/2018 – Spring/2022)
Dissertation: Modeling thermal and methane dynamics from the global freshwater ecosystems
Placement: Facebook/Meta

38) Lei Liu (PhD, Fall/2019 – Summer/2022)
Dissertation: Modeling carbon and nitrogen dynamics in northern high latitudes Placement: Zhengzhou University

39) Bailu Zhao (PhD, Fall 2019 – Spring/2023)
Dissertation: Modeling Holocene and Future Northern Peatland Dynamics in the Pan-Arctic Region

Placement: Post-doctoral Scientist at Princeton University

Former Post-Docs and Visiting Scholars (Total 15):

(1) Dr. Yanyu Lu (10/2008 – 01/2010)
Employed as Associate Professor at Anhui Climate Center, China

(2) Dr. Kai Xu (05/2007 - 05/2009)
Employed as Associate Professor at China University of Geosciences, Wuhan, China

(3) Dr. Jingfeng Xiao (06/2006-08/2008)
Employed as Research Assistant Professor at University of New Hampshire

(4) Dr. Yunfeng Hu (06/2007-12/2007)
Employed as Associate Scientist at Institute of Geographic Sciences and Natural Resources, Chinese Academy of Sciences, Beijing, China

(5) Dr. Jicheng He (01/2007-07/2007)
Employed as Associate Scientist at Institute of Tibetan Plateau, Chinese Academy of Sciences, Beijing, China

6) Dr. Weimin Song (11/2013 – 4/2014) Employed as Scientist at Tsinghua University

7) Dr. Liming Zhang (08/2014 – 08/2015)
Employed as Associate Professor at Fujian Agriculture and Forestry University

8) Dr. Xibao Xu (09/2015 -)
Associate Professor at Nanjing Institute of Geography and Limnology, the Chinese Academy of Sciences

9) Dr. Ying Xin (02/2016 -)
Associate Professor at Northeast Forestry University

10) Dr. Xiaodong Song (09/2016 -) Assistant Professor at Zhejiang University

11) Mr. Hanbo Yun (11/2016 -)
Engineer at the Cold and Arid Regions Environmental and Engineering Research Institute, the Chinese Academy of Sciences

12) Mr. Shuai Wang (02/2017 -) Shenyang Agricultural University

13) Dr. XuRi (08/2017 -)
Associate Professor at the Institute of Tibetan Plateau Research, the Chinese Academy of Sciences

14) Dr. Dan Guo (11/2017 -)
Assistant Professor at the Shenyang Agricultural University

15) Dr. Dan Kou (Summer/2019 -)
Joint Post-doctoral Scientist with University of Eastern Finland

Research Assistants (Total 3):

(1) Mr. Chris Reilly (Majored in Computer Science at Purdue) (Fall, 2010-)
(2) Ms. Jayne Piepenburg (BS in Nature Resources and BS in English) (Fall, 2011-)
(3) Mr. Elijah Waterman (Majored in Meteorology and Mathematics at Purdue, Fall 2012-)