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I. EDUCATION

- Ph.D., Yale School of Forestry and Environmental Studies, May 2013
- M.A. in Environmental Sciences, Peking University, July 2007;
- B.A. in Environmental Sciences, minor in Computer Science, Ocean University of China, July 2004

II. AWARDS AND HONORS

- Global Environmental Change Early Career Award, American Geophysical Union, 2022
- President's Award for Excellence in Application of Science, University of Maryland Center for Environmental Science, 2022
- World's top 2% scientists by Stanford University
- Faculty Early Career Development Program (CAREER) Award, National Science Foundation, 2021
- Best paper award at International Conference on Sustainable Development, Sep. 2019
- Yale Center for Environmental Law & Policy Research Prize, 2012
- Best Student Presentation Award, American Meteorological Society Conference, 2010
- Yale Center for Field Ecology Pilot Grants, 2008

III. PROFESSIONAL EXPERIENCE

University of Maryland Center for Environmental Science (UMCES) 2016-present

- ***Associate Professor,*** Appalachian Laboratory, June 2021- present
- ***Assistant Professor,*** Appalachian Laboratory, January 2016- June 2021

Princeton University 2012-2015

- ***Postdoctoral Research Associate,*** School of Public and International Affairs, November 2012-December 2015
- ***Postdoctoral Research Associate,*** Princeton Environmental Institute, November 2014-December 2015

United Nations 2011-2012

- ***Advisor on "Sustainable Development Dialogues",*** Executive Coordinator Office for Rio +20 United Nations Conference on Sustainable Development, February-June, 2012
- ***Policy Research Intern***, Division for Sustainable Development, Department for Economic and Social Affairs (DESA), June-August, 2011
- ***Sustainable Development Advisor***, Maldives Mission, March-May, 2011

Yale University 2008-2012

- ***Coordinator***, Environment and Sustainable Development Leadership Program, a joint effort among Yale, Tsinghua universities, and Chinese Mayors' Association, February 2010-June 2012
- ***Student Assistant,*** Yale-Chinese Women's Leadership Development Program, Office of International Affairs, May 2011

IV. Other Professional Affiliations

- ***Editor,*** Earth's Future, Jan. 2022-present
- ***Science Advisor,*** Working Group 3 for the Earth Commission on 'Nutrients and pollution'

(https://earthcommission.org/, hosted by Future Earth), Nov. 2020-present
- ***Panel member,*** International Fertilizer Association's Scientific Panel on Responsible Plant Nutrition, Nov. 2019-present
- ***Committee member,*** AGU Sustainability advisory group, April 2020-Oct. 2020
- ***Committee member,*** The Scientific Committee for the 8th Global Nitrogen conference, 2019-2021

V. Research Grants

Total funding awarded: $12,535,031
Total funding for proposals led by Xin Zhang: $8,194,231

1. National Science Foundation (NSF), 2023-2028 ($5,000,000) "Global Centers Track 1: Global Nitrogen Innovation Center for Clean Energy and Environment (NICCEE)" **PI: Xin Zhang**; CoI: Matthew Houser (UMCES and The Nature Conservancy), Eric Davidson (UMCES AL), Nick Wu (University of Massachusetts), David Kanter (New York University). OISE-2330502. In addition to NSF funding, the Center will be also supported by international collaborators, with funding sourced from U.K. Research and Innovation (about $3,000,000), and Natural Sciences and Engineering Research Council of Canada (about $3,000,000).
2. NSF, 2023-2027 ($2,841,159) "Collaborative Research: SCIPE: Enhancing the Transdisciplinary Research Ecosystem for Earth and Environmental Science with Dedicated Cyber Infrastructure Professionals", PI: Andrew Elmore (UMCES AL); **CoI: Xin Zhang**, Victoria Coles.
3. International Fertilizer Association, 2023-2024 ($269,989) "Improving global to national nutrient monitoring", **PI Xin Zhang.**
4. NSF, 2021-2025 ($510,000) "CAREER - Sustainable Nitrogen Management Across Spatial and System Scales" PI: Xin Zhang. CBET-2047165.
5. Belmont Forum, 2021-2022 ($360,000) "Guiding the pursuit for sustainability by co-developing a Sustainable Agriculture Matrix" **PI: Xin Zhang**; CoI: Christian Folberth (International Institute for Applied Systems Analysis, Austria), Luiz Antonio Martinelli (Universidade de São Paulo, Brazil), Thomas Oberthür (African Plant Nutrition Institute, Morocco), Tafadzwanashe Mabhaudhi (University of KwaZulu-Natal, South Africa), Levent Ozturk (Sabanci University, Turkey).
6. NSF, 2021-2024 ($500,000) "INFEWS: US-China: Managing Agricultural Nitrogen to Achieve Sustainable Food-Energy-Water Nexus in China and the U.S." **PI: Xin Zhang**; CoI: Eric Davidson. CBET-2025826.
7. Bayer, 2020-2022 ($750,000) "Enhancing Biodiversity & Resilience in Crop Production" PI: Wei Zhang (International Food Policy Research Institute); **CoI: Xin Zhang**, Jaboury Ghazoul (ETH Zurich).
8. National Aeronautics and Space Administration (NASA), 2020-2022 ($749,641) "LCLUC: Land-use transitions in Indonesian Peatlands", PI: Mark Cochrane (UMCES AL); **CoI: Xin Zhang**, Andrew Elmore (UMCES AL).
9. International Fertilizer Association, 2021 ($15,000) "Quantifying N deposition inputs to crop production", **PI Xin Zhang**
10. Food and Agriculture Organization of the United Nations, 2019-2020 ($27,000) "A literature review and analysis of the synergies and trade-offs between agricultural productivity and sustainability", **PI: Xin Zhang**
11. National Socio-Environmental Synthesis Center through the grant from National Science Foundation, 2018-2020 (financial and facility support for three international workshops with 18 participants) "Understanding dynamic environmental and socio-economic interactions in food systems to support decision-making towards a sustainable and resilient agriculture" **PI: Xin Zhang**; CoI: Eric Davidson (UMCES AL), Kimberly Pfeifer (Oxfam)
12. NSF, 2017-2022 ($1,252,467) "INFEWS/T2: Sustainable Agriculture in the nexus of food, energy,

water, and nutrient on national and global scales", **PI: Xin Zhang**; CoI: Cathlyn Stylinski (UMCES AL), Vyacheslav Lyubchich (UMCES CBL).

13. OCP Research, LLC, 2016-2018 ($193,275) "Managing Phosphorus for Sustainable Development" **PI: Xin Zhang**
14. National Socio-Environmental Synthesis Center through the grant from National Science Foundation, 2016-2017 (financial and facility support for an international workshop with 25 participants) "Developing a Sustainable Agriculture Matrix on a National Scale" **PI: Xin Zhang**; CoI: Eric Davidson
15. Cooperative Institute for Climate Science at Princeton, 2015-2016 ($72,000) "Improving the cropland parameterization in the GFDL land model LM3" **PI: Xin Zhang**; CoI: Denise Mauzerall (Princeton University)
16. Yale Center for Environmental Law & Policy, 2012-2013 ($7,500) "Using the Global Observation Network to Improve National Greenhouse Gas Inventories" **PI: Xin Zhang**
17. Yale Center for Field Ecology Pilot Grants, 2008 ($2,000) "Characterizing greenhouse gases emissions from corn and soybean plants" **PI: Xin Zhang**

VI. PUBLICATIONS

Total citation: 4,812; H-index: 28; i10-index: 43(Google Scholar)

Peer-reviewed publications

***** Corresponding author; † These authors contributed equally to this work
[#] Student or postdoc supervised by Zhang

2023

1. J Rockström, J Gupta, D Qin, SJ Lade, JF Abrams, LS Andersen, DI Armstrong McKay, X Bai, G Bala, SE Bunn, D Ciobanu, …, **X Zhang**, 2023. Safe and just Earth system boundaries. *Nature*, pp.1-10. doi: 10.1038/s41586-023-06083-8
2. S Cai, X Zhao, CM Pittelkow, M Fan, **X Zhang**, X Yan, 2023. Optimal nitrogen rate strategy for sustainable rice production in China, *Nature* 615 (7950): 73-79. doi: 10.1038/s41586-022-05678-x
3. J Zhao[#], AJ Elmore, JSH Lee, I Numata, **X Zhang***, MA Cochrane, 2023. Replanting and yield increase strategies for alleviating the potential decline in palm oil production in Indonesia. *Agricultural Systems*, 210, p.103714. doi: 10.1016/j.agsy.2023.103714
4. S Vishwakarma[#], **X Zhang***, A Dobermann, P Heffer, F Zhou, 2023. Global nitrogen deposition inputs to cropland at national scale from 1961 to 2020. *Scientific Data*, 10(1), p.488. doi: 10.1038/s41597-023-02385-8
5. N Möhring, D Kanter, R Aziz, IB Castro, F Maggi, L Schulte-Uebbing, V Seufert, FH Tang, **X Zhang**, P Leadley, 2023. Successful implementation of global targets to reduce nutrient and pesticide pollution requires suitable indicators. *Nature Ecology & Evolution*, pp.1-4. doi: 10.1038/s41559-023-02120-x
6. CI Ludemann, N Wanner, P Chivenge, A Dobermann, R Einarsson, P Grassini, A Gruere, K Jackson, L Lassaletta, F Maggi, F. G Obli-Laryea, MK van Ittersum, S Vishwakarma, **X Zhang**, FN Tubiello, 2023. A global reference database in FAOSTAT of cropland nutrient budgets and nutrient use efficiency: nitrogen, phosphorus and potassium, 1961–2020. *Earth System Science Data Discussions*, 2023, pp.1-24. doi:10.5194/essd-2023-206
7. X Liu[#], H Du, **X Zhang***, K Feng, X Zhao, H Zhong, N Zhang, Z Chen, 2023. Assessing Transboundary Impacts of Energy-Driven Water Footprint on Scarce Water Resources in China: Catchments under Stress and Mitigation Options. *Environmental Science & Technology*. doi: 10.1021/acs.est.2c08006

8. A Dobermann, T Bruulsema, I Cakmak, B Gerard, K Majumdar, M McLaughlin, P Reidsma, B Vanlauwe, E Wollenberg, F Zhang, **X Zhang**, 2023. A new paradigm for plant nutrition. *Science and Innovations for Food Systems Transformation*, p.361.

2022

9. T Zou[#], **X Zhang***, EA Davidson, 2022. Global Trends of Cropland Phosphorus Use and Sustainability Challenges, *Nature.* doi:10.1038/s41586-022-05220-z
(This paper was featured by Nature Food with a News and Views article: EK Burchfield, 2022. Where and how to grow food. Nature Food. doi:10.1038/s43016-022-00663-z)
10. T Li†[#], **X Zhang**†, EA Davidson, Z Dou, W Zhang*, PS Pavinato, LA Martinelli, DR Kanter, J Liu, F Zhang, 2022. A Hierarchical Framework for Unpacking the Nitrogen Challenge, *Earth's Future*. doi:10.1029/2022EF002870
11. P Wolfram, P Kyle, **X Zhang**, S Gkantonas, S Smith, 2022. Potential nitrogen cycle disturbance from the use of ammonia for maritime shipping, *Nature Energy*. doi:10.1038/s41560-022-01124-4
12. S Vishwakarma[#], **X Zhang***, V Lyubchichb, 2022. Wheat trade tends to happen between countries with contrasting extreme weather stress and synchronous yield variation. *Communications Earth & Environment.* doi:10.1038/s43247-022-00591-7
13. **X Zhang,** Y Wang[#], L Schulte-uebbing, W De Vries, T Zou[#], EA Davidson, 2022. Sustainable nitrogen management index: definition, global assessment and potential improvements. *Frontiers of Agricultural Science and Engineering*. doi:10.15302/J-FASE-2022458
14. **X Zhang**, L Lassaletta, 2022. Manure management benefits climate with limits. *Nature Food*, 3(5), pp.312-313. doi:10.1038/s43016-022-00496-w
15. S Vishwakarma[#], **X Zhang***, ND Mueller, 2022. Projecting future nitrogen inputs: are we making the right assumptions? *Environmental Research Letters*, 17(5), p.054035. doi:10.1088/1748-9326/ac6619
16. I Numata, AJ Elmore, CJ Wang, J Zhao, **X Zhang**, MA Cochrane, 2022. Deforestation, plantation-related land cover dynamics and oil palm age structure change during 1990-2020 in Riau Province, Indonesia. *Environmental Research Letters*. doi:10.1088/1748-9326/ac8a61
17. A Dobermann, T Bruulsema, I Cakmak, B Gerard, K Majumdar, M McLaughlin, P Reidsma, B Vanlauwe, L Wollenberg, F Zhang, **X Zhang**, 2022. Responsible plant nutrition: A new paradigm to support food system transformation. *Global Food Security*, 33, p.100636. doi:10.1016/j.gfs.2022.100636
18. J Zhao[#], JSH Lee, AJ Elmore, YA Fatimah, I Numata, **X Zhang***, MA Cochrane, 2022. Spatial patterns and drivers of smallholder oil palm expansion within peat swamp forests of Riau, Indonesia. *Environmental Research Letters*. doi:10.1088/1748-9326/ac4dc6
(This paper was featured by Mongabay: https://news.mongabay.com/2022/08/nearness-to-roads-and-palm-oil-mills-a-key-factor-in-peatland-clearing-by-smallholders/)
19. E Sinha, KV Calvin, PG Kyle, MI Hejazi, ST Waldhoff, M Huang, S Vishwakarma, and **X Zhang**, 2022. Implication of imposing fertilizer limitations on energy, agriculture, and land systems. *Journal of environmental management*, 305, p.114391. doi:10.1016/j.jenvman.2021.114391
20. M Ollenburger[#], GP Kyle and **X Zhang**, 2022. Uncertainties in estimating global potential yields and their impacts for long-term modeling. *Food Security*. doi:10.1007/s12571-021-01228-x
21. Y Guo, P He, T Searchinger, Y Chen, M Springmann, M Zhou, **X Zhang**, L Zhang, D Mauzerall, 2022. Environmental and human health trade-offs in potential Chinese dietary Shifts. *One Earth,* 5(3): 268-282. doi:10.1016/j.oneear.2022.02.002

2021

22. **X Zhang†,** G Yao†, S Vishwakarma, C Dalin, AM Komarek, DR Kanter, KF Davis, K Pfeifer, J Zhao, T Zou, P D'Odorico, C Folberth, F Galeana, J Fanzo, L Rosa, W Dennison, M Musumba, A

Heyman, EA Davidson (2021a). Quantitative assessment of agricultural sustainability reveals divergent priorities among nations, *One Earth.* doi:10.1016/j.oneear.2021.08.015

23. X Liang, SK Lam, **X Zhang**, O Oenema, D Chen, 2021. Pursuing sustainable nitrogen management following the "5 Ps" principles: Production, People, Planet, Policy and Partnerships. *Global Environmental Change*, 70, p.102346. doi:10.1016/j.gloenvcha.2021.102346
24. G Yao[#], **X Zhang***, F Taheripour, EA Davidson (2021). The increasing global environmental consequences of a weakening US–China crop trade relationship. *Nature Food*, pp.1-9. doi: 10.1038/s43016-021-00338-1
    (This paper was featured by Nature Food with a News and Views article: M Li, W Zhang, 2021. Trade policies have environmental implications. Nature Food. doi:10.1038/s43016-021-00342-5)
25. **X Zhang**†*, T Zou[#]†, L Lassaletta†, N Mueller, MD Lisk, C Lu, R Conant, J Gerber, H Tian, T Bruulsema, W Zhang, K Nishina, B Bodirsky, A Popp, L Bouwman, A Beusen, D Leclere, P Canadell, R Jackson, F Tubiello, EA Davidson* (2021b). Quantification of global and national nitrogen budgets for crop production, *Nature Food*. doi:10.1038/s43016-021-00318-5
26. C Ren, S Jin, Y Wu, B Zhang, D Kanter, B Wu, X Xi, **X Zhang**, D Chen, J Xu, B Gu (2021). Fertilizer overuse in Chinese smallholders due to lack of fixed inputs. *Journal of Environmental Management*. doi:10.1016/j.jenvman.2021.112913
27. Z Quan[#], **X Zhang***, Y Fang, EA Davidson (2021). Different quantification approaches for nitrogen use efficiency lead to divergent estimates with varying advantages. *Nature Food*. doi: 10.1038/s43016-021-00263-3
28. Z Quan[#], **X Zhang***, F Zhu, S Li, X Zhao, X Chen, LM Zhang, JZ He, W Wei, Y Fang (2021). Fates and use efficiency of nitrogen fertilizer in maize cropping systems and their responses to technologies and management practices: a global analysis on field ^{15}N tracer studies, *Earth's Future*. doi:10.1029/2020EF001514
29. GS Metson, A Chaudhary, **X Zhang**, B Houlton, A Oita, N Raghuram, QD Read, L Bouwman, H Tian, A Uwizeye, AJ Eagle (2021). Nitrogen and the food system. *One Earth*. Jan 22; 4(1):3-7. doi:10.1016/j.oneear.2020.12.018
30. R Chowdhury[#], **X Zhang*** (2021) Phosphorus use efficiency in the agricultural system: A comprehensive assessment through the review of national scale substance flow analyses, *Ecological Indicators*, 121, p.107172. doi:10.1016/j.ecolind.2020.107172
31. Z Quan[#], **X Zhang***, Y Fang (2021) The undefined N source might be overestimated by ^{15}N tracer trials, *Global Change Biology*. doi:10.1111/gcb.15371

2020

32. **X Zhang**, EA Davidson, T Zou[#], L Lassaletta, Z Quan[#], T Li[#], W Zhang (2020) Centennial Challenges: Quantifying nutrient budgets to inform sustainable nutrient management. *Global Biogeochemical Cycles* 34, e2018GB006060. doi:10.1029/2018GB006060
    (Top 10% most downloaded article in 2021)
33. R Prudhomme, T Brunelle, P Dumas, AL Moing, **X Zhang** (2020) Assessing the impact of increased legume production in Europe on global agricultural emissions. *Regional Environmental Change* 20 (3):1-13. doi:10.1007/s10113-020-01651-4
34. GC Hurtt, LP Chini, R Sahajpal, SE Frolking, J Fisk, B Bodirsky, KV Calvin, S Fujimori, K Goldewijk, T Hasegawa, P Havlik, A Heinimann, F Humpenöder, JO Kaplan, T Krisztin, DM Lawrence, P Lawrence, O Mertz, A Popp, K Riahi, E Stehfest, D van Vuuren, L de Waal, **X Zhang** (2020) Harmonization of global land-use scenarios for the period 850-2100 (LUH2) for CMIP6, *Geoscientific Model Development*. doi:10.5194/gmd-2019-360
35. Z Quan[#], S Li, **X Zhang**, F Zhu, P Li, R Sheng, X Chen, LM Zhang, JZ He, W Wei, Y Fang (2020) Fertilizer nitrogen use efficiency and fates in maize cropping systems across China: Field 15N tracer studies. *Soil and Tillage Research* 197:104498. doi:10.1016/j.still.2019.104498
36. DR Kanter, W Winiwarter, B Bodirsky, L Bouwman, E Boyer, S Buckle, J Compton, T Dalgaard, W Vries, D Leclere, A Leip, C Müller, A Popp, N Raghuram, S Rao, M Sutton, H Tian, H Westhoek, **X Zhang**, M Zurek (2020). A framework for nitrogen futures in the shared socioeconomic

pathways, *Global Environmental Change* 61:102029. doi:10.1016/j.gloenvcha.2019.102029

2019

37. T li†[#], **X Zhang**†, H Gao, B Li, H Wang, Q Yan, M Ollenburger[#], W Zhang (2019) Exploring optimal nitrogen management practices within site-specific ecological and socioeconomic conditions. *Journal of Cleaner Production.* doi:10.1016/j.jclepro.2019.118295

38. G Huang[#], G Yao[#], J Zhao[#], MD Lisk, C Yu, **X Zhang*** (2019) The environmental and socioeconomic trade-offs of importing crops to meet domestic food demand in China. *Environmental Research Letters.* doi:10.1088/1748-9326/ab3c10

39. BZ Houlton, M Almaraz, V Aneja, AT Austin, E Bai, KG Cassman, JE Compton, EA Davidson, JW Erisman, JN Galloway, B Gu, G Yao[#], LA Martinelli, K Scow, WH Schlesinger, TP Tomich, C Wang, **X Zhang** (2019) A world of co-benefits: Solving the global nitrogen challenge. *Earth's Future*. doi:10.1029/2019EF001222

40. BN Sulman, E Shevliakova, ER Brzostek, SN Kivlin, S Malyshev, DNL Menge, **X Zhang** (2019) Diverse mycorrhizal associations enhance terrestrial C storage in a global model. *Global Biogeochemical Cycles.* doi:10.1029/2018GB005973

2018

41. W Peng, F Wagner, MV Ramana, H Zhai, MJ Small, C Dalin, **X Zhang**, DL Mauzerall (2018) Managing China's coal power plants to address multiple environmental objectives. *Nature Sustainability* 1(11): 693-701. doi:10.1038/s41893-018-0174-1

2017

42. **X Zhang** (2017) A plan for efficient use of nitrogen fertilizers. *Nature* 543:322-323. doi:10.1038/543322a

2016

43. D Kanter, **X Zhang**, DL Mauzerall, S Malyshev, E Shevliakova (2016) The importance of climate change and nitrogen use efficiency for future nitrous oxide emissions from agriculture. *Environmental Research Letters* 11. 094003. doi:10.1088/1748-9326/11/9/094003

2015

44. **X Zhang**, EA Davidson, DL Mauzerall, TD Searchinger, P Dumas, Y Shen (2015a) Managing Nitrogen for Sustainable Development. *Nature* 528(7580): 51-59. doi: 10.1038/nature15743. *(This paper was featured on the cover of Nature)*

45. **X Zhang**, DL Mauzerall, EA Davidson, DR Kanter, RH Cai (2015b) The economic and environmental consequences of implementing nitrogen-efficient technologies and management practices in agriculture. *Journal of Environmental Quality* 44(2):312-324. doi:10.2134/jeq2014.03.0129.

2014

46. DR Kanter, **X Zhang**, DL Mauzerall (2014) Reducing nitrogen pollution while decreasing farmers' costs and increasing fertilizer industry profits. *Journal of Environmental Quality* 44(2): 325-335. doi:10.2134/jeq2014.04.0173.

47. M Kang, C Kanno, M Reid, **X Zhang**, DL Mauzerall, M Celia, Y Chen, TC Onstott (2014) Direct measurements of methane emissions from abandoned oil and gas wells in Pennsylvania. *Proceeding of the National Academy of Sciences* 111(51): 18173-18177. doi:10.1073/pnas.1408315111.

48. **X Zhang**, X Lee, TJ Griffis, JM Baker, W Xiao (2014) Estimating regional greenhouse gas fluxes: An uncertainty analysis of planetary boundary layer techniques and bottom-up inventories. *Atmospheric Chemistry and Physics* 14(19): 10705-10719. doi:10.5194/acp-14-10705-2014.

49. **X Zhang**, X Lee, TJ Griffis, JM Baker, M Erickson, J Fasbinder, W Xiao, N Hu (2014) Quantifying nitrous oxide fluxes on multiple spatial scales in the Upper Midwest, USA. *International Journal*

of Biometeorology 59(3): 299-310. doi:10.1007/s00484-014-0842-4.

2013

50. **X Zhang**, X Lee, TJ Griffis, JM Baker, M Erickson, W Xiao, N Hu (2013) The influence of plants on atmospheric methane in an agriculture-dominated landscape. *International Journal of Biometeorology* 58(5): 819-833. doi:10.1007/s00484-013-0662-y.
51. TJ Griffis, X Lee, JM Baker, MP Russelle, **X Zhang**, R Venterea, DB Millet (2013) Reconciling the differences between top-down and bottom-up estimates of nitrous oxide emissions for the US Corn Belt. *Global biogeochemical cycles* 27(3): 746-754. doi:10.1002/gbc.20066.

2011

52. TJ Griffis, X Lee, JM Baker, K Billmark, N Schultz, M Erickson, **X Zhang**, J Fassbinder, W Xiao, N Hu (2011) Oxygen isotope composition of evapotranspiration and its relation to C4 photosynthetic discrimination. *Journal of Geophysical Research - Biogeosciences* 116, G01035. doi:10.1029/2010JG001514

2010

53. TJ Griffis, SD Sargent, X Lee, JM Baker, J Greene, M Erickson, **X Zhang**, K Billmark, N Schultz, W Xiao, N Hu (2010) Determining the oxygen isotope composition of evapotranspiration with eddy covariance. *Boundary-Layer Meteorology* 137(2): 307-326. doi:10.1007/s10546-010-9529-5

2006

54. **X Zhang**, X Cai (2006) Structures and Characteristics of the Atmospheric Boundary Layer over Beijing Area in Autumn, *Journal (Natural Sciences) of Peking University*, 42(2): 220-225.

2004

55. W Qu, X Xu, F Huang, **X Zhang**, T Zhang, (2004) Effect of Abnormal Temperature Variation in the Tropical Pacific on High Level Air Temperature, *Advances in Marine Science,* 22(2): 147-155.

In review

56. S Vishwakarma#, X Zhang*, V Lyubchichb, Historical trends of wheat yield shocks and their drivers across the globe, in review by *Nature Food* since Nov. 2022.
57. GP Kyle, M Ollenburger#, X Zhang, H Niazi, S Durga, and Y Ou, Assessing Multi-Dimensional Impacts of Achieving Sustainability Goals by Projecting the Sustainable Agriculture Matrix into the Future, in review by *Earth's Future* since Oct. 2022.
58. J Gupta, X Bai, DM Liverman, J Rockström, D Qin, B Stewart-Koster, JC Rocha, L Jacobson, JF Abrams, LS Andersen, DIA McKay, G Bala, SE Bunn, D Ciobanu, F DeClerck, K Ebi, L Gifford, C Gordon, S Hasan, N Kanie, TM Lenton, S Loriani, A Mohamed, N Nakicenovic, D Obura, D Ospina, K Prodani, C Rammelt, B Sakschewski, J Scholtens, T Tharammal, D van Vuuren, PH Verburg, R Winkelmann, C Zimm, E Bennett, A Bjørn, S Bringezu, W Broadgate, H Bulkeley, B Crona, P Green, H Hoff, L Huang, M Hurlbert, CYA Inoue, Ş Kilkiş, SJ Lade, J Liu, I Nadeem, C Ndehedehe, C Okereke, I Otto, S Pedde, L Pereira, L Schulte-Uebbing, JD Tàbara, W de Vries, G Whiteman, C Xiao, X Xu, N Zafra-Calvo, X Zhang, A just world on a safe planet: Earth system boundaries, transformations and translation, in review by *Lancet* since June 2022.

Peer-reviewed conference paper

59. G Yao[#], **X Zhang*** (2020) The role of international trade in wheat supply resilience, An Agricultural & Applied Economics Association (AAEA) selected paper accepted for presentation at AAEA Annual Meeting, Virtual, August 10-11, 2020. Available at https://ageconsearch.umn.edu/record/304641?ln=en. doi: 10.22004/ag.econ.304641
60. G Yao[#], **X Zhang***, E Davidson, F Taheripour, W Tyner (2020) The environmental consequences of a weakening US-China crop trade relationship, An Agricultural & Applied Economics Association (AAEA) selected paper accepted for presentation at AAEA Annual Meeting, Virtual,

August 10-11, 2020. Available at: https://ageconsearch.umn.edu/record/304646?ln=en. doi: 10.22004/ag.econ.304646

61. G Yao[#], **X Zhang***, S Vishwakarma[#], C Dalin, A Komarek, DR Kanter, KF Davis, K Pfeifer, J Zhao, T Zou, P D'Odorico, C Folberth, F Galeana, J Fanzo, L Rosa, W Dennison, E Davidson (2020) Measuring national socio-economic aspects of sustainable agriculture and the interactions with environmental indicators, An Agricultural & Applied Economics Association (AAEA) selected poster accepted for presentation at AAEA Annual Meeting, Virtual, August 10-11, 2020. Available at: https://ageconsearch.umn.edu/record/304643?ln=en. doi: 10.22004/ag.econ.304643
62. RH Cai, **X Zhang**, DR Kanter (2014) The impact of crop price on nitrous oxide emissions: A dynamic programming approach, An Agricultural & Applied Economics Association (AAEA) selected paper accepted for presentation at AAEA Annual Meeting, Minneapolis, MN, July 27-29, 2014. Available at: https://ageconsearch.umn.edu/record/170691?ln=en. doi:10.22004/ag.econ.170691

Book chapters

63. A Dobermann, T Bruulsema, I Cakmak, B Gerard, K Majumdar, M McLaughlin, P Reidsma, B Vanlauwe, L Wollenberg, F Zhang, **X Zhang** (2023). A new paradigm for plant nutrition. In Science and Innovations for Food Systems Transformation (pp. 361-374). Cham: Springer International Publishing.
64. X Zhang, T Zou (2023). Managing Nutrients in the Anthropocene: Integrating Social and Ecological Perspectives. Lectures in Modern Ecology. Higher Education Press.
65. J Ranganathan, D Vennard, R Waite, B Lipinski, T Searchinger, P Dumas, A Forslund, H Guyomard, S Manceron, E Marajo-Petitzon, C Le Mouël, P Havlik, M Herrero, **X Zhang**, S Wirsenius, F Ramos, X Yan, M Phillips and R Mungkung (2016) Shifting Diets for a Sustainable Food Future, Working Paper, Installment 11 of Creating a Sustainable Food Future. Washington, DC: World Resources Institute. Accessible at http://www.worldresourcesreport.org.
66. **X Zhang,** Y Zhao, MS Ashton, X Lee (2012) Measuring carbon in forests, in *Managing Forest Carbon in a Changing Climate* (M. Ashton, M. L. Tyrrell, D Spalding, B Gentry eds), Springer, New York, 139-164.
67. JC Chan, **X Zhang** (2009) Air Pollution Status and Challenges Ahead in the Greater Pearl River Delta Region, in *Lectures on China's Environment*, Yale School of Forestry & Environmental Studies Publication Series Report Number 20.

Reports

68. L Lassaletta, X Zhang, and coauthors, 2022. Guidance document on nitrogen use efficiency indicators for different purposes. International Nitrogen Management System (INMS).
69. T Bruulsema, A Dobermann, I Cakmak, B Gerard, K Majumdar, M McLaughlin, P Reidsma, B Vanlauwe, L Wollenberg, F Zhang, **X Zhang,** 2022. Furthering 4R Nutrient Stewardship. Issue Briefs by Scientific Panel on Responsible Plant Nutrition. https://www.sprpn.org/issue-briefs
70. S Attwood, A Dobermann, T Bruulsema, I Cakmak, B Gerard, K Majumdar, M McLaughlin, P Reidsma, B Vanlauwe, L Wollenberg, F Zhang, **X Zhang,** 2021. Achieving Nature-positive Plant Nutrition: Fertilizers and Biodiversity. Issue Briefs by Scientific Panel on Responsible Plant Nutrition. https://www.sprpn.org/issue-briefs
71. A Dobermann, T Bruulsema, I Cakmak, B Gerard, K Majumdar, M McLaughlin, P Reidsma, B Vanlauwe, L Wollenberg, F Zhang, **X Zhang,** 2021. A New Paradigm for Plant Nutrition. Issue Briefs by Scientific Panel on Responsible Plant Nutrition. https://www.sprpn.org/issue-briefs
72. T Zou[#], **X Zhang** (2019) Global phosphorus use in crop production: the past, present, and future. Final report. OCP Research LLC.
73. T Zou[#], **X Zhang**, EA Davidson (2020) Evaluating tradeoffs and synergies between agricultural productivity and sustainability. Final report. Food and Agriculture Organization of the United Nations.
74. **X Zhang** (2011) A Network Analysis of Clean Technology Cooperation Programs, an internship

report for UN DESA.

Popular articles

1. **X Zhang** (2016) #IamAg! Meet Xin, Assistant Professor at the University of Maryland, *Farming First*. https://farmingfirst.org/2016/10/iamag-meet-xin-assistant-professor-at-the-university-of-maryland/
2. **X Zhang,** Cheryl Palm, Eric A. Davidson (2016) What can be done about badly depleted nitrogen levels in Africa's soil, *The Conversation*. https://theconversation.com/what-can-be-done-about-badly-depleted-nitrogen-levels-in-africas-soil-54611
3. **X Zhang** (2012) The future we want: special report for the Rio+20 United Nations Conference on Sustainable Development, *World Environment*. http://www.wem.org.cn/
4. S Shao, **X Zhang** (2006) Personal Experience in Alashan, *World Environment*, No.4: 48-52.
5. **X Zhang,** T Lin (2005) An Investigation into the Urban Planning and Development of Zitong, a southwest county in China, Embodied in Social Practice Reports of Peking University.
6. G He, **X Zhang** (2005) Perspective on Yuanmingyuan Project, *Life World*, No.5: 48-61.

E-learning modules

7. X Zhang (2021) The interactive learning module "Synergies and tradeoffs in food, land and water systems" developed by Agro Landscapes, a project funded by the CGIAR Research Program on Water, Land and Ecosystems. Home page: https://agrolandscapes.org/tosa-page/home/. Link to the interview https://videos.files.wordpress.com/NVu6Y5u7/38_xin_itw_edited.mp4
8. X Zhang (to be launched in 2022) Nutrient Use Efficiency and Other Indicators of Nutrient Management Performance. Sustainable Fertilizer Academy, an initiative of International Fertilizer Association.

VII. Teaching and Training

A. University System of Maryland Courses Taught

MEES622	Sustainability Science: Quantitative and Systems Approach (Spring 2018, 2020)
MATH/COSC495	Directed Consulting on environmental modeling (Spring 2021, 2022)
MEES699	Biogeochemistry (Lecture; Spring 2018)
MEES620	Environment and Society (Lecture; Fall 2019, 2020,2021,2022)
MEES699	SPEC PRB ESTUR SCI: Tradeoffs and synergies for sustainable agriculture (Fall 2019)

B. Graduate Students Supervised as Major Advisor

Name	Degree	Institution	Progress	Dissertation Title
Tan Zou	Ph.D.	UMCES	Graduated. Currently works as a postdoc fellow jointly supported by International Fertilizer Association and UMCES	Sustainable Phosphorus Management across Systems and Spatial Scales
Srishti Vishwakarma	Ph.D.	UMCES	Graduated. Currently works at Pacific Northwest National Laboratory as a postdoc	Assessing socioeconomic and ecological drivers for crop yield and agricultural sustainability
Yanyu Wang	Ph.D.	UMCES	Enrolled in Summer 2021	Nitrogen Management for sustainable Food-Energy-Water nexus in US and China
Meghna Matthews	M.A.	UMCES	Enrolled in Fall 2022	Food system and environmental justice
Jun Suk Byun	Ph.D.	UMCES	Enrolled in Fall 2023	Transdisciplinary and system approach for sustainable nitrogen management

C. Graduate Students Advised as Graduate Committee Member

Name	Degree	Institution	Progress	Dissertation Title
Jake Hagedorn	Ph.D.	UMCES	Graduated, Lecture at University of North Carolina at Asheville	Nitrous oxide, methane, and soil nitrate dynamics in a drainage water controlled agricultural field on the Eastern Shore of Maryland
Qiurui Zhu	Ph.D.	UMCES	Successfully defended the dissertation in Nov. 2022	Quantifying nitrous oxide and methane fluxes using the tower-based gradient method on a drainage water managed farm on the Eastern Shore of Maryland
Natalie Snider	Ph.D.	UMCES	Passed comprehensive exam in July 2020 Now, Associate Vice President for Environmental Defense Fund	Coastal Resilience
Yu Xin	Ph.D.	Univ. of Maryland College Park	Graduated, Postdoc research scientist at University of Maryland	Forest Change and Estate Crop Expansion in Indonesia: Biophysical and Socioeconomic Analysis

D. Postdoctoral Researchers Supervised

Jing Zhao in process at UMCES AL
Guolin Yao in process at UMCES AL
Mary Ollenburger co-advised, in process at Pacific Northwest National Laboratory
Rubel Chowdhury Research Scientist at Deakin University, Australia

E. Visiting Students or Scholars Advised

Tingyu Li	Visiting Ph.D. student from Chinese Agriculture University, now Associate professor at Hainan University
Guorui Huang	Visiting Ph.D. student from Tsinghua University, now Senior Staff at China Geological Survey
Kaiyan Luo	Visiting Ph.D. student from North China Electric Power University, now postdoc at China Electric Power Planning & Engineering Institute
Xi Liu	Visiting Ph.D. student from Tianjin University, now postdoc at Shandong University, Weihai Institute for Interdisciplinary Research
Zhi Quan	Visiting Research Scientist, now Associate Research Scientist at Institute of Applied Ecology, Chinese Academy of Sciences

F. Other Students or teachers advised through the *iFarm* project funded by NSF

Xushu Wang	High school student	High School Affiliated to Renmin University of China
Meige Yang	High school student	High School Affiliated to Renmin University of China
Eashan Siddalingaiah	High school student	Poolesville High School
Carolyn Levine	High school student	Poolesville High School
Mikhail Krepets	High school student	Poolesville High School
Pascal Sossou	High school student	Poolesville High School
Janice Bailey	High school teacher	Poolesville High School

VIII. Academic and community service

A. Service to UMCES and University System of Maryland

UMCES Faculty Senate, 2022-present
Chair of the Admission committee for Environment and Society Foundation, 2022-present
MEES Program committee, 2017-present
Committee for the Environment and Society Foundation, 2017- present
Coordinator of the UMCES AL visiting scholar lecture series, 2017 Spring
UMCES AL Faculty search committee, 2016-2017

B. Service to national and international scientific community

Peer Review

Editor, Earth's Future, 2022-present

Associate editor, Sustainable Horizons, 2021-present

Guest editor, Global Biogeochemical Cycles, Journal of Geophysical Research: Biogeosciences, Agriculture, Ecosystems & Environment

Peer-reviewer, Nature, Science, Nature Geoscience, Global Biogeochemical Cycles, Global Change Biology, Bioscience, Environmental Research Letters, Agricultural and Forest Meteorology, Journal of Cleaner Production, Environmental Reviews, Sustainability, Environmental Science & Technology, GeoHealth, Journal of Environmental Management

Report reviewer, United Nations Environment Programme Report (The Forgotten Pollutants: Nitrous Oxide and the Disruption of Climate and the Ozone Layer), International Energy Agency Report (Nitrogen Fertiliser Technology Roadmap)

Proposal reviewer or review panelist, United States National Science Foundation, United States Department of Energy, German Federal Ministry of Education and Research

Peer-review panel participant, United States Department of Energy

Review materials for an online course on "Future of Food" *(2017)*
https://serc.carleton.edu/integrate/teaching_materials/food_supply/index.html

Other activities

Quantifying Nutrient Budgets for Sustainable Nutrient Management Special Session at American Geophysical Union (AGU) annual meeting, leading organizer, co-organize with Dr. Luis Lassaletta, Dr. Nathan D. Mueller, Dr. Richard T. Conant, Dr. Josep G. Canadell, Dr. Eric A. Davidson, Dr. Jill S. Baron, Dr. Kate Tully, Dr. Wilfried Winiwarter, 2018-present

Quantifying Nutrient Budgets for Sustainable Nutrient Management Special Issue across five AGU journals (including Global Biogeochemical Cycles, Earth's Future, Journal of Geophysical Research: Biogeosciences, Geophysical Research Letters, GeoHealth), leading organizer, co-organize with Dr. Eric A. Davidson, Dr. Luis Lassaletta, Dr. Nathan D. Mueller, Dr. Richard T. Conant, Dr. Josep G. Canadell, 2018-2021

Special Issue on "Farm size and environment" at Agriculture, Ecosystems & Environment (AGEE), co-lead organizer, co-lead with Dr. Baojing Gu, Dr. Bernard Vanlauwe, and Dr. Stefan Reis, 2021-present

Quantifying Nutrient Budgets for Sustainable Nutrient Management Special Session at the 8th Global Nitrogen conference, leading organizer, co-organize with Dr. Luis Lassaletta, 2019 Aug.-present

International Nitrogen Management System project, participant, 2018-present

The Plant Nitrogen Network National Steering Committee, 2017-present

Sustainable Agricultural Matrix workshop at SESYNC, co-lead with Dr. Eric Davidson and Dr. Kimberly Pfeifer, 2016–present

Global N_2O Budget Workshop, co-organize with Dr. Eric Davidson, Dr. Hanqin Tian, Dr. Pep Canadell, and Dr. Robert Jackson, June-Dec., 2017

C. Public Service

Expert panelist, working group 3 for the Earth Commission on 'Nutrients and pollution' (https://earthcommission.org/, hosted by Future Earth), Nov. 2020-present

Expert panelist, International Fertilizer Association's Scientific Panel on Responsible Plant Nutrition, Nov. 2019-present

Committee member, Advisory Committee for TGCC (The Greater Cumberland Committee) Forest Products ESG Certified Branding Project, Nov. 2021-Jan. 2023

Committee member, AGU Sustainability advisory group, April 2020-Oct 2020

Committee member, The Scientific Committee for the 8th Global Nitrogen conference, 2019-2021

President, Association of Chinese Students and Scholars at Yale, May 2009-May 2010

Co-organizer, Doctoral Research Conference, Yale School of Forestry and Environmental Studies, February 2008- February 2009

Chinese youth delegate, Tällberg Forum, June 2007

Chairman, Graduate Students Union, College of Environmental Sciences, Peking University, September 2005- September 2006

Beijing Moderator, Global Classroom, "Exploring the Links between International Business and Poverty Reduction," joint MIT-World Bank program, February-March 2006

Founder and Chairman, Students' International Environmental Forum (2006) Organizing committee, May 2006-June 2006

Chinese youth delegate, the fourth World Water Forum, March 2006

Lead Contributor, "World Environment," Ministry of Environmental Protection publication, September 2005-2012

IX. SELECTED SEMINARS AND CONFERENCE PRESENTATIONS

I=Invited talk; P=Poster

1. **X Zhang,** LP Canisares, R Castro, P Chivenge, C Folberth, KE Jackson, L Nkengla, L Ozturk. *Measuring the impacts of agricultural production on sustainability.* Sustainable Agriculture Matrix (SAM) Learning Event, hosted by Oxfam, Sep. 14, 2023 (I)
2. **X Zhang**. *Guiding the pursuit of sustainable agriculture with data-driven and transdisciplinary approaches.* Efficient Nutrition Use and Green Agriculture Development Consortium, Dali, China, July 30, 2023 (I)
3. **X Zhang,** L Ozturk, C Folberth, P Chivenge, LA Martinelli, T Mabhaudhi, JP Ometto, KE Jackson, L Nkengla, RC Bernardini, S Vishwakarma, W Dennison, EA Davidson. *Sustainable Agriculture Matrix (SAM) Consortium: A Transdisciplinary and Transnational Network to Guide the Pursuit of Sustainable Agriculture.* American Geophysical Union (AGU) 2022 Fall Meeting, Chicago and online, Dec. 13 2022 (I).
4. **X Zhang**, A Komarek, W Zhang, M Castellano. *Co-developing a framework and indicators for assessing the performance of biodiversity enhancing practices.* Research Seminar titled "Enhancing Biodiversity and Resilience in Intensive Farming Systems: Results from an ETH Zürich-IFPRI Collaborative study", online (Recording: https://www.ifpri.org/event/enhancing-biodiversity-and-resilience-intensive-farming-systems-results-eth-ifpri). Dec 6, 2022 (I)
5. **X Zhang***, Decarbonization in a eutrophic world: Is nutrient-efficient agriculture a magic cure?* invited seminar at Carnegie Science, Stanford campus (https://bse.carnegiescience.edu/xin-zhang-decarbonization-eutrophic-world-nutrient-efficient-agriculture-magic-cure). Nov 30, 2022 (I)
6. **X Zhang,** *Nitrogen Use Efficiencies in cropping systems,* invited keynote for the XXI International Nitrogen Workshop, October 2022 (I)
7. P Wolfram, P Kyle, **X Zhang**, S Gkantonas, S Smith. Ammonia as a maritime shipping fuel: do the benefits outweigh the risks. Potential and impacts of the uptake of novel energy carriers, organized by Corporate Partnership Board of the International Transport Forum. Online, April. 1 2022 (I)
8. **X Zhang,** Interdisciplinary and Integrative Systems Frameworks. INFEWS PI Workshop, online, Feb 9, 2022 (I)
9. **X Zhang,** *A plan for efficient use of nitrogen fertilizers.* Reducing chemical input in agriculture: Barriers & solutions, a workshop organized by Cland, a convergence institute funded by French government. Feb 3-4, 2022 (I)
10. **X Zhang,** T Zou, *Sustainable Nutrient Management across Systems and Spatial Scales in the Chesapeake Bay Watershed*, Chesapeake Bay Speaker Series organized by Maryland Department of the Environment, Jan 27, 2022 (I)
11. **X Zhang,** *Understanding and assessing discrepancies in nutrient budgets,* American Geophysical Union (AGU) 2021 Fall Meeting, New Orleans, LA and online, Dec. 13-17, 2021 (P).
12. T Zou, **X Zhang**, Eric Davidson, *Sustainable Nitrogen and Phosphorus Management across Systems and Spatial Scales in the Chesapeake Bay Watershed,* Invited talk for the American Geophysical Union (AGU) 2021 Fall Meeting, New Orleans, LA and online, Dec. 13-17 2021 (I).
13. T Zou, **X Zhang**, Eric Davidson *Improving Phosphorus Use Efficiency in Cropland to Address Phosphorus Challenges by 2050,* American Geophysical Union (AGU) 2021 Fall Meeting, New Orleans, LA and online, Dec. 13-17 2021 (P).
14. **X Zhang,** *Sustainable Agriculture Matrix: An Overview.* Learning Event hosted by Oxfam America, online, Oct. 13 2021 (I)
15. **X Zhang,** *Nutrient Use Efficiencies on and Beyond Crop Farms,* Soil Fertility and Plant Nutrition Symposium 2021, South Africa and online, Sep. 15 2021 (I)

16. **X Zhang,** *Global nutrient cycles in relation to food.* Science Days for the United Nations Food Systems Summit, Virtual event "A new paradigm for plant nutrition", online, July 7 2021 (I)
17. **X Zhang,** invited keynote for the 8th Global Nitrogen Conference, Berlin, Germany, June 2021 (I)
18. **X Zhang,** Tan Zou, Eric A. Davidson. *Evaluating Tradeoffs and Synergies Between Agricultural Productivity and Sustainability*, Policy roundtable on "Synergies and Tradeoffs in Sustainable Agriculture" organized by Food and Agriculture Organization of the United Nations (FAO) DC office, online (Meeting Recording: https://bit.ly/2SXcE52), May 2020 (I)
19. **X Zhang,** *Current state of nitrogen around the world,* invited keynote for the "curtain-raiser" event to the 8th Global Nitrogen Conference, online (Meeting Recording: https://www.youtube.com/watch?v=OEuDfa8sxY8&feature=youtu.be), May 2020 (I)
20. **X Zhang,** *Nitrogen Use Efficiency Trends and the Sustainability of Agricultural Production,* International Fertilizer Association (IFA) Global Stewardship Conference, New York, Feb. 2020 (I)
21. **X Zhang**, Eric A. Davidson, Guolin Yao, et al. *A Sustainable Agricultural Matrix (SAM) for Protecting Earth's Climate*, American Geophysical Union Fall Meeting, San Francesco, Dec. 2019 (I)
22. **X Zhang**, et al., *Discrepancies in Nitrogen Budgets and Nitrogen Use Efficiencies for crop production*, International Nitrogen Management System workshop, Madrid, Spain, Nov. 2019 (I)
23. **X Zhang,** *Nitrogen Use Efficiency: definition, global trends, and their key drivers*. International Fertilizer Association (IFA) Webinar Nitrogen Use Efficiency for Climate Change Adaptation & Mitigation, Nov. 2019 (https://www.youtube.com/watch?v=fsKd8PH9myQ&feature=youtu.be)
24. **X Zhang,** EA Davidson, G Yao, J Zhao, S Vishwakarma, T Zou: *A National Scale Sustainable Agriculture Matrix of Indicators to Inform Policy*, International Conference on Sustainable Development, New York, NY, Sep. 2019 (I; won the ***Best Paper Award***).
25. **X Zhang**, Eric A. Davidson, Guolin Yao, et al. *Sustainable Agricultural Matrix (SAM).* Roundtable on Measuring Progress Towards Sustainable Agriculture. Organized by Food and Agriculture Organization of the United Nations (FAO) DC office, Washington D.C., June 2019 (I) http://www.fao.org/north-america/news/detail/en/c/1199670/
26. **X Zhang**, *Managing Nutrient in the Anthropocene: Integrating Ecological and Social Perspectives,* the 10th International Symposium on Modern Ecology, Hebei, China, May 2019 (I)
27. **X Zhang**, Eric A. Davidson, *Improving Nitrogen and Water Management in Crop Production on a National Scale,* American Geophysical Union Fall Meeting, Washington D.C., Dec. 2018 (I)
28. **X Zhang**, Luis Lassaletta, Nathan Mueller, Tan Zou, Matthew D. Lisk , Crystal Lu, Rich Conant, James Gerber, Hanqin Tian, Tom Bruulsema, Weifeng Zhang, Kazuya Nishina, Benjamin Bodirsky, Alexander Popp, Lex Bouwman, Pep Canadell, Rob Jackson, Eric A. Davidson, *Tracking fast-evolving Nitrogen budgets in crop production on a national scale*, American Geophysical Union Fall Meeting, Washington D.C., Dec. 2018 (P)
29. **X Zhang**, *Nitrogen Use Efficiency Indicators at Country Level*, European Union Nitrogen Expert Panel, Rothamsted Research, Harpenden, UK, May 23, 2018 (I)
30. EA Davidson, **X Zhang**, J Zhao, T Zou, MD Lisk, *Developing a Sustainable Agriculture Matrix on National Scales*, Japan Geoscience Union Meeting, Japan, May 20, 2018 (I)
31. **X Zhang,** *Assessing agricultural intensification strategies with a Sustainable Agriculture Matrix,* 255th America Chemistry Society National Meeting, New Orleans, LA, Mar. 18, 2018 (I, Best presentation)
32. **X Zhang,** *Nitrogen Use Efficiency: Historical Trends and Future Targets*, International Nitrogen Management System Workshop, New York, NY, Jan. 16, 2018 (I)
33. **X Zhang,** *Global and regional Nitrogen budget data intercomparison*, AGU Global N_2O Budget Side Event, New Orleans, LA, Dec. 13, 2017 (I)

34. **X Zhang**, EA Davidson, G Huang, T Zou, MD Lisk, 2017. Assessing Agricultural Intensification Strategies with a Sustainable Agriculture Matrix, American Geophysical Union Fall Meeting, New Orleans, LA, Dec., 2017 (P)
35. **X Zhang**, EA Davidson, T Zou, J Zhao, MD Lisk, 2017. How a national scale Sustainable Agriculture Matrix can inform policy? American Geophysical Union Fall Meeting, New Orleans, LA, Dec., 2017 (P)
36. **X Zhang**, *Sustainable Agriculture and Nitrogen Management: A Global Perspective*, Healthy Soils Consortium, Maryland Department of Agriculture, Annapolis, MD, Nov. 27, 2017 (I)
37. E Davidson and **X Zhang**, *Manure Happens: The Consequences of Feeding Seven Billion Human Omnivores*, plenary talk for the 9th US Symposium on Harmful Algae, Baltimore, MD, USA, Nov. 11, 2017 (I)
38. **X Zhang,** *Assessing agricultural intensification strategies with a Sustainable Agriculture Matrix,* keynote talk for International Conference of Nitrogen Cycling and Its Environmental Impacts in East Asia (NCEIEA), Nanjing, China, Oct. 20, 2017 (I)
39. **X Zhang**, *Sustainable Nutrient Management in Agricultural Production: Integrating Social and Ecological Perspectives*, The Henry Samueli School of Engineering, University of California, Irvine, CA Sep. 29th, 2017 (I)
40. **X Zhang**, *Sustainable Agriculture Matrix*, SESYNC workshop, Annapolis, MD, Aug. 28th, 2017 (I)
41. **X Zhang**, R Chowdhury, The historical trends of Phosphorus use in the crop production, OCP Symposium, Morocco, May 2017 (I)
42. **X Zhang**, *National NUE trends and socioeconomic drivers*, Nitrogen: At the Nexus Between Food Security and Sustainability, A Virtual Symposium, Mar. 9, 2017 (I)
43. **X Zhang**, *The Nitrogen Use Efficiency Paradox: searching for win-win outcomes for farmers and the environment*, The Delmarva Conservation Partnership Winter Partner Meeting, Chesapeake College, MD, Jan. 18, 2017 (I)
44. **X Zhang**, *Nitrogen use efficiency trends in different parts of the world*, The 84th International Fertilizer Industry Association Annual Conference, Moscow, Russia, May. 30, 2016 (I)
45. **X Zhang**, et al., *Managing Nitrogen Managing Nitrogen for Sustainable Intensification of Crop Production*, The Second International Conference on Global Food Security, Ithaca, NY, USA, Oct. 13, 2015 (I)
46. **X Zhang**, *Nitrogen Use Efficiency*, Keynote speech for the Annual meeting for EU projects PANDA and MacroPolo, Hamburg, Germany, Jan. 26, 2015 (I)
47. **X Zhang,** et al., *Managing Nitrogen in the anthropocene: integrating social and ecological science*, American Geophysical Union Fall Meeting, San Francisco, CA, USA, Dec. 18, 2014 (I)
48. **X Zhang,** et al., *Evaluating uncertainties in nitrous oxide emission inventories with multi-scale observations for an agriculture-dominated region*, American Geophysical Union Fall Meeting, San Francisco, CA, USA, Dec. 15, 2014 (I)
49. **X Zhang**, *Managing nitrogen in crop production: the efficiency paradox*, Princeton Studies Food Conference, Princeton, NJ, USA, Sep. 26, 2014 (I)
50. M Kang, **X Zhang,** M Reid, C Kanno, M Celia, D Mauzerall, K Sun, D Miller, M Zondlo, Y Chen, T Onstott, *Significant methane emissions from abandoned oil and gas wells in Northwest Pennsylvania,* American Geophysical Union Fall Meeting, San Francisco, CA, USA, Dec. 17, 2013 (I)
51. **X Zhang,** D Mauzerall, *Impediments in improving nitrogen use efficiency in crop production – an economic perspective,* the 6th International Nitrogen Conference, Kampala, Uganda, Nov. 18, 2013 (I)

52. **X Zhang,** D Mauzerall, R Cai, *The impact of improving nitrogen use efficiency on nitrous oxide emissions from cropland,* The Soil Science Society of America (SSSA) Nitrogen Use Efficiency Conference, Kansas City, MO, USA, Aug. 13, 2013 (P)
53. **X Zhang,** et al., *Estimating the Greenhouse Gas Budgets of an Agriculture-Dominated Landscape*, American Meteorological Society 30th Conference on Agricultural and Forest Meteorology and first conference on atmospheric Biogeosciences, Boston, MA, USA, May 30, 2012 (I)
54. **X Zhang,** et al., *Top-down Constraints on the Landscape-scale Nitrous Oxide Budget in the Upper Midwest*, American Geophysical Union Fall Meeting, San Francisco, CA, USA, Dec. 17, 2010 (P)
55. **X Zhang**, *The Future Change-makers: Opportunities for Youth*, Beijing Forum 2010, Beijing, China, Nov. 6 (I)
56. **X Zhang,** et al., *Evaluating Land Surface Flux of Methane and Nitrous Oxide in an Agricultural Landscape with Tall Tower Measurements and a Trajectory Model*, American Meteorological Society 29th Conference on Agricultural and Forest Meteorology, Keystone, CO, USA, Aug. 4, 2010 (I)
57. **X Zhang,** et al., *Characterizing CO_2, CH_4, and N_2O Fluxes in a Landscape Dominated by Soybean and Corn*, American Geophysical Union Fall Meeting, San Francisco, CA, USA, Dec. 17, 2009 (P)
58. **X Zhang** et al., *Spatio-temporal Variation of Air Pollutants and Footprint Analysis of Regional Accumulation Effect over PRD Area*, The 12th International Joint Seminar on Regional Deposition Processes in the Atmosphere, Beijing, China, Nov. 14, 2006 (P)
59. **X Zhang,** et al., *Business Plan of "Blue Spire" Environmental Management Consulting Ltd.*, 12th International Environmental Forum on Leapfrogging Development in China, Beijing, China, May, 2006 (I)
60. **X Zhang**, *Water --the basic of poverty reduction and sustainable development*, The 4th World Water Forum, Mexico City, Mexico, Mar. 20, 2006 (I)
61. **X Zhang**, *Poverty reduction requires systematic change,* Global Classroom, MIT-World Bank joint program, Beijing and Boston, Mar. 8, 2006 (I)
62. **X Zhang**, *Public participation in Green Olympics,* Green Olympics Forum, Beijing, China, Dec. 8, 2005(I)