**XIA ZHU-BARKER**

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**Current Position** **General Information**

Assisstant Professional Researcher Former name: Xia Zhu

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University of California-Davis, Davis, CA 95616 Office: 3232 PES

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**EDUCATION** Fax: (530)752-1552

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**Ph.D. in Soil Biogeochemistry and Nutrient Cycling, Botany, June 2013**

*Chengdu Institute of Biology, Chinese Academy of Sciences, Chengdu, China*

Dissertation: Factors and Mechanisms Controlling Emission of Nitrous oxide from Soil

**M.S. in Agroecology, June 2009**

*Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, China.*

Thesis:Study on Nitrogen cycling in Long-term Fertilization of Soils under

Different Thermal Zones

**B.S. in Agricultural Resources and Environmental Chemistry, June 2006**

*Northeast Agricultural University, Harbin, China*

## PROFESSIONAL EXPERIENCE

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Sepetember 2019- **Assisstant Professional Researcher**. *Dept. of Land, Air and Water Resources, University of California, Davis, CA.*

July 2019 – August 2019 **Associate Project Scientist**.  *Dept. of Land, Air and Water Resources, University of California, Davis, CA.*

September 2015 – June 2019 **Assisstant Project Scientist**.  *Dept. of Land, Air and Water Resources, University of California, Davis, CA.*

May 2013 – September 2015 **Postdoctoral Researcher**. *Dept. of Land, Air and Water Resources, University of California, Davis, CA.*

2010-2013 **Junior Specialist** & **Visiting Scholar**. *Dept. of Land, Air and Water Resources,*

*University of California, Davis, CA*

2009-2010 **Graduate students Researcher.** *Chengdu Institute of Biology,*

*Chinese Academy of Sciences, China*

2006-2009 **Researcher Assistant.**  *Northeast Institute of Geography and Agro-ecology,*

*Chinese Academy of Sciences, China*

2005-2006 **Lab Technician.** *Northeast Institute of Geography and Agro-ecology, Chinese*

*Academy of Sciences, China*

**TEACHING EXPERIENCE & OUTREACH ACTIVITY**

──────────────────────────────────────────────────────────────────**Teaching Experience**

2018- **Lecturer of Stable Isotope Biogeochemistry Research Seminar Series.**

University of California Davis

2009-2010 **Teaching Assistant in the course of Ecosystem Ecology.** *Sichuan*

*University & Chengdu Institute of Biology, Chinese Academy of Sciences, China*

2007-2009 **Teaching Assistant in the course of Soil Fertility and Nutrient**

**Management.** *Northeast Agricultural University & Northeast Institute of*

*Geography and Agroecology, Chinese Academy of Sciences, China*

**Outreach Activity**

2019 **Participating and presentating** in cover crop planting and seeding

caliberation workshops and climate and agricultural practices for growers

workshops

2018- **Organizing and participating** in extension workshops on building healthy

soils via organic amendments and cover crops

2017-2019 **Leading demonstration projects** that focuses on building cover cropping

systems in almond orchards, walnut orchards, and developing compost

guidelines for tomato growers to increase soil health

2015-2016 **Leading an extension and outreach project** with undergraduate students

on foodwaste and greenwaste composting

2013-2018 **Contributing to** **mentoring** more than 30 Ph.D., M.Sc. and B.Sc. students on

research activities.

* 1. **Conference Organizer, Session Chair and Presider**
* Organizer and session chair for oral and poster sessions “Meeting the Challenge to Develop Sustainable and Resilient Agricultural Systems By Understanding Soil-Plant-Microbiome Relationships”. Soil Science Society of America Annual Meetings, Jan. 2019. San Diego, CA.
* Organizer and session chair on a Symposium ­entitled “Soil Organic Amendments and N Cycling: Strategies to Improve Nitrogen Use Efficiency, Reduce Synthetic Fertilizer Input, Nitrate Leaching, and Nitrous Oxide Emissions”. Soil Science Society of America Annual Meetings, Nov. 2016. Phoenix, AZ.
* Primaryconvener and session chair on an oral session “Coupling N Cycle and Soil Carbon Dynamics: Understanding the Nexus Between Land Managements and Greenhouse Gases (Nitrous Oxide, Methane) Emission and Mitigation Potential”. American Geophysical Union Annual Meeting, Dec 2016. San Francisco, CA.
* Co-organizer and session chair for an oral session on “Molecular, Genomic and Isotopic Approaches to Resolving Biotic and Abiotic pathways of Nitrous Oxide Production in Terrestrial and Marine Ecosystems”. American Geophysical Union Annual Meeting, 2014. San Francisco, CA.
* Presider for an oral session on “The Role of Soil Management in Influencing Nitrous Oxide Emissions and Microbial Processes”. Soil Science Society of America Annual Meetings, 2012. Cincinnati, OH.

**PEER-REVIEWED PUBLICATIONS** *(\* indicates corresponding author)*

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1. [Xia Zhu-Barker, Mark Easter, Amy Swan, Mary Carlson, Lucas Thompson, William R Horwath, Keith Paustian, Kerri L Steenwerth.](https://dl.sciencesocieties.org/publications/sssaj/articles/0/0/sssaj2018.11.0446) [[Soil Management Practices to Mitigate Nitrous Oxide Emissions and Inform Emission Factors in Arid Irrigated Specialty Crop Systems](https://dl.sciencesocieties.org/publications/sssaj/articles/0/0/sssaj2018.11.0446)](https://www.mdpi.com/2571-8789/3/4/76)[.](https://dl.sciencesocieties.org/publications/sssaj/articles/0/0/sssaj2018.11.0446) ***[Soil Systems](https://dl.sciencesocieties.org/publications/sssaj/articles/0/0/sssaj2018.11.0446)***[, 2019, 3, 76; doi:10.3390/soilsystems3040076](https://dl.sciencesocieties.org/publications/sssaj/articles/0/0/sssaj2018.11.0446)
2. [Lu-Jun Li, Rongzhong Ye, Xia Zhu-Barker, William R Horwath. Soil Microbial Biomass Size and Nitrogen Availability Regulate the Incorporation of Residue Carbon into Dissolved Organic Pool and Microbial Biomass](https://dl.sciencesocieties.org/publications/sssaj/articles/0/0/sssaj2018.11.0446). ***Soil Science Society of America Journal.*** 2019, doi:10.2136/sssaj2018.11.0446.
3. Shuling Wang, Sarwee J. Faeflen, Alan L. Wright, Xia Zhu-Barker, Xianjun Jiang. [Redox-driven shifts in soil microbial community structure in the drawdown zone after construction of the Three Gorges Dam](https://link.springer.com/article/10.1007/s42832-019-0005-y). ***Soil Ecology Letters***, 2019, 1-12
4. Zhihui Wang, Yanqiang Cao, Xia Zhu-Barker, Graeme W Nicol, Alan L Wright, Zhongjun Jia, Xianjun Jiang. [Comammox Nitrospira clade B contributes to nitrification in soil](https://www.sciencedirect.com/science/article/pii/S0038071719301634). ***Soil Biology & Biochemistry***. 2019, 135, 392-395.
5. Sequoia Williams, Xia Zhu-Barker\*, Benjamin James Croze, Kenna R Fallan,

Stephanie Lew, William R. Horwath . Impact of Composting Food Waste with

Green Waste on Greenhouse Gas Emissions from Compost Windrows. ***Compost Science & Utilization***, 2019, 1-11

1. Zhihui Wang, Yao Meng, Xia Zhu-Barker, Xinhua He, William R Horwath, Hongyan Luo, Yongpeng Zhao, Xianjun Jiang. Responses of nitrification and ammonia oxidizers to a range of background and adjusted pH in purple soils. ***Geoderma***. 2019, 334, 9-14.
2. Xueru Huang, Jun Zhao, Jing Su, Zhongjun Jia, Xiuli Shi, Alan L Wright, Xia Zhu-Barker, Xianjun Jiang. Neutrophilic bacteria are responsible for autotrophic ammonia oxidation in an acidic forest soil. ***Soil Biology & Biochemistry***. 2018, 119, 83-89.
3. Lu-Jun Li, Xia Zhu-Barker\*, Rongzhong Ye, Timothy A. Doane, William R. Horwath. Soil microbial biomass size and soil carbon influence the priming effect from carbon inputs depending on nitrogen availability. ***Soil Biology & Biochemistry***. 2018, 119, 41-49.
4. Xiu-Zhen Shi, Hang-Wei Hu, Xia Zhu-Barker, Helen Hayden, Jun-Tao Wang, Helen Suter, Deli Chen, Ji-Zheng He. Nitrifier-induced denitrification is an important source of soil nitrous oxide and can be inhibited by a nitrification inhibitor 3,4-dimethylpyrazole phosphate (DMPP). ***Environmental Microbiology***. 2017, doi: 10.1111/1462-2920.13872.
5. Shan-Shan Dai, Lu-Jun Li, Rongzhong Ye, Xia Zhu-Barker, William R. Horwath. The temperature sensitivity of organic carbon mineralization is affected by exogenous carbon inputs and soil organic carbon content. ***European Journal of Soil Biology.*** 2017, 81, 69-75.
6. Geng Sun, Xia Zhu-Barker, Dongming Chen, Lin Liu, Nannan Zhang, Changguang Shi, Liping He, Yanbao Lei. Responses of root exudation and nutrient cycling to grazing intensities and recovery practices. ***Plant and Soil***. 2017, 1-11.
7. Xia Zhu-Barker\*, Shannon Bailey, Kyaw Tha Paw U, Martin Burger, William R Horwath. Greenhouse gas emissions from compost pile. ***Waste Management*.** 2017, 59, 70-79.
8. Xueru Huang, Xia Zhu-Barker, William R. Horwath, Sarwee J. Faeflen, Hongyan Luo, Xiaoping Xin, Xianjun Jiang. Effect of iron oxide on nitrification in two agricultural soils with different pH. ***Biogeosciences***. 2016,13, 5609-5617.
9. Lucas C.R. Silva, Sun Geng, Xia Zhu-Barker, William R. Horwath. Tree growth acceleration and expansion of alpine forests: the synergistic effect of atmospheric and edaphic change. ***Science Advances***. 2016, 2(8): e1501302-e1501302
10. Miao, S., R. Ye, X. Zhu-Barker, Y. Qiao, T. A. Doane, and W.R. Horwath. The solubility of carbon inputs affects the priming of soil organic matter. ***Plant and Soil*.** 2016, doi:10.1007/s11104-016-2991-1
11. Geng Sun, Zhiyuan Wang, Xia Zhu-Barker, Nannan Zhang, Ning Wu, Lin Liu, Yanbao Lei. Biotic and abiotic controls in determining exceedingly variable responses of ecosystem functions to extreme seasonal precipitation in a mesophytic alpine grassland. ***Agricultural and Forest Meteorology***. 2016 (228):180-190.
12. F Wang, S Chen, K Zhang, S Shen, X Zhu-Barker. Impact of nitrogen fertilizer source on nitrous oxide (N2O) emissions from three different agricultural soils during freezing conditions. ***Toxicological & Environmental Chemistry***. 2016, 98 (5-6), 551-560.
13. Xia Zhu-Barker\*, Martin Burger, William R. Horwath, Peter G. Green. Direct green waste land application: How to reduce its impacts on greenhouse gas and volatile organic compound emissions? ***Waste Management***. 2016, doi: 10.1016/j.wasman.2016.03.024.
14. Xia Zhu-Barker, Amanda R. Cavazos, Nathaniel E. Ostrom, William R. Horwath, Jennifer B. Glass. [The importance of abiotic reactions for nitrous oxide production](http://link.springer.com/article/10.1007/s10533-015-0166-4). ***Biogeochemistry*.** 2015, 126(3): 251-267. DOI 10.1007/s10533-015-0166-4
15. Xia Zhu-Barker\*, William R. Horwath, Martin Burger. Knife-injected anhydrous ammonia increases yield-scaled N2O emissions compared to broadcast or band-applied ammonium sulfate in wheat. ***Agriculture, Ecosystems and Environment***. 2015, 212: 148-157.
16. Xia Zhu-Barker\*, Timthy A Doane, William R Horwath. The role of green waste compost on N2O production pathways in agricultural soil. ***Soil Biology & Biochemistry****.* 2015, 83, 57-65.
17. Yunfa Qiao, Shujie Miao, Xia Zhu\***,** et al. The effect of N fertilizer practices on N balance and global warming potential of maize-soybean-wheat rotation system as affected by long-term fertilization in Northeast of China. ***Field Crops Research***. 2014, 161: 98-106. [doi: 10.1016/j.fcr.2014.03.005](http://dx.doi.org/10.1016/j.fcr.2014.03.005).
18. Xia Zhu\*, Martin Burger, Timthy A Doane, William R Horwath. Ammonia oxidation pathways and nitrifier denitrification are significant sources of N2O and NO under low oxygen availability. ***Proceedings of the National Academy of Sciences of the United States of America*** *(****PNAS****).* 2013, 110 (16): 6328-6333.doi: 10.1073/pnas.1219993110.
19. Xia Zhu\*, Timthy A Doane, Lucas C. R. Silva, William R Horwath. Iron: The Forgotten Driver of Nitrous Oxide Production in Soil. ***PLoS One***. 2013*,* 8(3): e60146. doi: 10.1371/journal.pone.0060146.
20. Xia Zhu\*, Lucas C. R. Silva, Timthy A Doane, Ning Wu, William R Horwath. Quantifying the effects of compost application, water content and nitrogen fertilization on N2O emissions in ten agricultural soils. ***Journal of Environmental Quality*.** 2013, 42(3): 912-918. doi: 10.2134/jeq2012.0445.

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| 1. Liu Lin, Xia Zhu, Geng Sun, Peng Luo. Effects of simulated warming and fertilization on activities of soil enzymes in alpine meadow. [***Pratacultural Science***](http://c.wanfangdata.com.cn/Periodical-caoyekx.aspx). 2011, 28 (8):1405-1410. |  |

1. Xia Zhu, Han Xiaozeng, Wang Fengju. The Characteristics of Nitrogen Use Efficiency and Soil Nitrogen supplying after Long-term Fertilization in Black Soil. ***System Sciences and Comprehensive Studies in Agriculture***, 2010, 26(5).
2. Xia Zhu, Han Xiaozeng, Qiao Yunfa. Influence of Soluble Carbon and Nitrogen on N2O Emission from Different Thermal Zones Soil. ***Journal of Agro-environment Science***, 2009, 28(6): 2637-2644.
3. Han Xiaozeng, Xia Zhu, Qiao Yunfa. Influence of Long-term Fertilization on Nitrogen Supply Capacity in Different Thermal Zones Soil. ***Acta Agriculture Boreali-Sinica***, 2009, 24(5):1-5.
4. Xia Zhu, Han Xiaozeng, Qiao Yunfa. Influence of Soluble Carbon and Nitrogen on Ammonia Volatilization from Different Thermal Zones Soil. ***Environmental Science***, 2009, 30 (12): 25-30.
5. Xia Zhu, Han Xiaozeng. Effects of Land Use on Nitrogen Content in Black Soil. ***Jiangsu Journal of Agricultural Sciences***, 2008, 24(6):843-847.

**BOOK CHAPTERS**

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1. Xia Zhu-Barker, Kerri Steenwerth. Nitrous Oxide Production from Soils in the Future: Processes, Controls and Responses to Climate Change. In Kuzyakov, Y., W.R. Horwath. ***Developments in Soil Science***. 2018, 35, 131-183. **Invited.**
2. Xia Zhu-Barker, Mark Easter, Amy Swam, William R. Horwath, Keith Paustian, Kerri Steenwerth. Identifying Greenhouse Gas Emission Sources and Mitigation Potential in California Specialty Cropping Systems. USDA greenhouse gas inventory book “Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory” addedum. 2017. Published by U. S. Department of Agriculture Office of the Chief Economist. Washington, DC 20250

**PUBLISHED REPORTS & ARTICLES**

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1. Xia Zhu-Barker, Rod Venterea, Martin Burger, William R. Horwath. Addressing gaps in estimates of NOx from California agricultural land. Science Advances, 2018, eLetters. <http://advances.sciencemag.org/content/4/1/eaao3477/tab-e-letters>
2. Martin Burger, Xia Zhu, Peter G. Green. Research to Evaluate Environmental Impacts of Direct Land Application of Uncomposted Green and Woody Wastes on Air and Water Quality. 2015, Calrecycle, DRRR-2015-01531. <http://www.calrecycle.ca.gov/Publications/Detail.aspx?PublicationID=1531>
3. William R. Horwath, Xia Zhu-Barker, Shannon K. Bailey, Martin Burger, Eric R. Kent, Kyaw Tha Paw U. Research to Evaluate Nitrous Oxide (N2O) Emissions from Compost in Supporting of AB 32 Scoping Plan Composting Measure. 2015, Calrecycle, DRRR-2015-01544. <http://www.calrecycle.ca.gov/Publications/Detail.aspx?PublicationID=1544>
4. Xia Zhu. Nothing Is Impossible. *Crop Science Society of America News*. April 29, 2014. **Invited**. <https://www.soils.org/files/students/nothing-is-impossible.pdf>

**GRANTS**

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1. Cover Crop Strategies to Tighten Nitrogen Cycling, Save Water, and Increase Soil Carbon in Walnut Orchards. USDA-CDFA Specialty Crop Block Grant. Nov. 1, 2019- April 30, 2022. **Xia Zhu-Barker** (PI), William Horwath (co-PI), Kerri Steenwerth (cooperator), Hyunok Lee(cooperator), Katherine Jarvis-Shean. $449,000.
2. Developing best management practices for tomato growers to use compost by understanding its effects on C and N dynamics. USDA-CDFA Specialty Crop Block Grant. Nov. 1, 2018- April 30, 2021. **Xia Zhu-Barker** (PI), William Horwath (co-PI), Kerri Steenwerth (cooperator), Hyunok Lee(cooperator), Brenna Aegerter (cooperator), Daniel J. Geisseler (cooperator). $297,742.
3. Developing compost management guidelines for tomato growers to reduce greenhouse gas emissions and increase soil health. California Department of Food and Agriculture (CDFA), Healthy Soil Program.July. 1, 2019- March 31, 2022. **Xia Zhu-Barker** (PI), William Horwath (co-PI), Kerri Steenwerth (cooperator), Brenna Aegerter (cooperator). $250,000.
4. Strengthening the Climate Resilience of Central Coast Specialty Crops with Organic Amendments Using COMET-Farm Tool. USDA-CDFA Specialty Crop Block Grant. Nov. 1, 2018- April 30, 2021. Maria Fuente (PI), William Horwath (co-PI), **Xia Zhu-Barker** (co-PI, received $75,000). $300,000
5. Extending specialty crops modelling work and updating the USDA GHG entity level methods document. USDA-OCE. Keith Paustian (PI), Kerri Steenwerth (co-PI), **Xia Zhu-Barker** (co-PI, received $80,000), William Horwath (co-PI), Mark Easter (co-PI).July. 1, 2018- Dec. 30, 2019. $500,000
6. Developing N management plan for incorporation of co-composted greenwaste and foodwaste and chemical fertilizer. Water Resource Control Board, July 1, 2018- January 31, 2021. William Horwath (PI), **Xia Zhu-Barker** (co-PI). $199,987.
7. Investigating N losses for manure composting and developing its mitigation practices. Water Resource Control Board. July 1, 2019- June 30, 2022. William Horwath (PI), **Xia Zhu-Barker** (co-PI). $200,000.
8. Developing cover cropping systems for California almond orchards to increase soil carbon sequestration. California Department of Food and Agriculture, Healthy Soil Program. Amelie Gaudin (PI), **Xia Zhu-Barker** (co-PI), William R. Horwath (co-PI). May 1, 2018-December 31, 2020. $99,828
9. Evaluation of certified organic fertilizers mineralization for long-term nutrient planning. CDFA-FREP. **Xia** **Zhu-Barker** (Project leader), William R. Horwath(Project leader). Jan 1, 2018-Dec 31, 2020. $250,000.
10. Investigate Climate Change Impacts in California and Promote DayCent/COMET-Farm on CA specialty crops. USDA Regional Climate Hubs, USDA-OCE, USDA-NRCS, and CDFA. **Xia** **Zhu-Barker** (Collaborator), Kerri Steenwerth(PI). Jan 1, 2016-December 31, 2018. $150,000.
11. Converting Manure to Reduce Greenhouse Gas Emissions, Minimize Environmental Impacts, and Enhance the Economic Feasibility of Dairy Operations. July 1, 2016-June 30, 2018. CDFA. William R. Horwath (PI), **Xia Zhu-Barker** (co-PI). $255,909.
12. Mitigation of greenhouse gas emissions from soils by use of biosolids. Feng Wang, **Xia Zhu-Barker** (co-PI), Keqiang Zhang. National Science Foundation of China. Jan 1, 2017-Dec. 31, 2020. $130,000.
13. Rice culture in the Sacramento-San Joaquin Delta to mitigate past agricultural impacts, improve water quality and sequester carbon. USDA NIFA. June 1, 2012-May 31, 2016. William R. Horwath, Jacob Fleck, Phil Bachand, Steve Deverel… **Xia Zhu** (Participation). $2,000,000.
14. Evaluating mitigation options of N2O emissions in CA cropping systems. CA Air Resources Board. May 1, 2012-Nov. 30, 2015. William R. Horwath, Martin Burger, **Xia Zhu** (Participation). $ 400,000.
15. Research to Evaluate Nitrous Oxide (N2O) Emissions from Compost In Support Of AB 32 Scoping Plan Composting Measure. California Dept. of Resources Recycling and Recovery. Oct. 1, 2010- Dec. 2014. William R. Horwath, Kyaw Tha Paw U, **Xia Zhu** (Participation). $680,000.
16. Defining and implementing agricultural management practices to mitigate and adapt to climate change. USDA NIFA. Nov. 1, 2012-Oct. 31, 2016. William R. Horwath, Martin Burger, Putnam, **Xia Zhu** (Participation). $744,000.
17. Research to evaluate environmental impacts of direct land application of uncomposted green and woody wastes on air and water quality. California Dept. of Resources Recycling and Recovery. June 21, 2012- March 31, 2014. Martin Burger (co-PI), **Xia Zhu** (co-PI), Peter G. Green (PI). $175,000.

*Pending:*

1. Improving N management guidelines for super-high-intensive olive orchards. USDA-CDFA Specialty Crop Block Grant. **Xia Zhu-Barker** (PI), William Horwath (co-PI), Majdi Abou Najm (co-PI), Louise Ferguson (co-PI), Danielle Lightle (cooperator). $450,000. *Pending*
2. Evaluating Ammonia, NOx and Greenhouse gas emissions from dairy manure digestee and lagoon water land application. William Horwath (PI), **Xia Zhu-Barker** (co-PI), $431,462. *Pending*
3. Developing Management Strategies To Increase Soil Productivity And Mitigate Greenhouse Gas Emissions From Organic Cropping Systems.USDA ORG. **Xia Zhu-Barker** (PI), William Horwath (co-PI), Kerri Steenwerth (cooperator), Magaret G Lloyd (co-PI). $499,764. *Pending*
4. Changes In Soil C And N Cycling Under Subsurface Drip Irrigation: Implications For Nutrient Management In Micro-Irrigated Agricultural Systems. USDA AFRI. **Xia Zhu-Barker** (PI), William Horwath (co-PI), Jorge Rodrigues (co-PI), Helen Dahike (co-PI). $497,290. *Pending.*
5. Enhancing Resilience And Sustainability Of Cropping Systems Through Organic Amendments To Increase Soil Productivity. USDA NIFA., **Xia Zhu-Barker** (PI), William Horwath (co-PI), Jorge Rodrigues (co-PI), Kerri Steenwerth (co-PI). Steve Olgo (co-PI).$1,194,610. *Pending*
6. Predicting the N2O flux imbalance in the Amazon Rainforest under future climate scenarios. Jorge Rodrigues (PI), **Xia Zhu-Barker** (co-PI), William Horwath (co-PI). National Science Foundation-Department of Energy. $740,000. *Pending*

**ORAL/KEYNOTE PRESENTATIONS**

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1. **Xia Zhu-Barker,** Ehsan Toosi, William Horwath. Nitrogen Isotope Composition of Organically and Conventionally Grown Crops. Soil Science Society of America Meeting, San Antonio, TX. Nov 10, 2019
2. Cole Smith, **Xia Zhu-Barker**, Maria de la Fuente, William R. Horwath. Exploring Nitrogen Fertilizer Transformations Using an Indirect 15N Field Method in California's Central Coast Vegetable Crops. Soil Science Society of America Meeting, San Diego, CA. Jan. 7, 2019
3. Rylie Ellison, **Xia Zhu-Barker**, William R. Horwath. Improving Nutrient Use and Reducing Greenhouse Gas Emissions of Dairy Manure through Hydrodynamic Cavitation and Chemical Coagulation Processes. Soil Science Society of America Meeting, San Diego, CA. Jan. 7, 2019
4. **Xia Zhu-Barker**. The Use of Organic Soil Amendments: Soil Productivity and Greenhouse Gas Emissions. Central Coast Organic Matter Amendments Workshop, Salinas, CA, Nov. 17, 2018. **Invited Talk**
5. Xia Zhu-Barker, William R. Horwath. Identifying Greenhouse Gas Emissions Sources and Mitigation Opportunities in California Specialty Cropping systems. USDA Cochran Fellowship meeting, Davis, CA, September 27, 2017. **Invited Talk**
6. **Xia Zhu-Barker**. Soil N cycling and organic amendments: Strategies to improve N use efficiency and reduce N losses in agricultural ecosystem. ZJU-UCD Soil Science Summit, Davis, CA, August 29, 2017. **Invited Talk**
7. Lujun Li, **Xia Zhu-Barker**, Rongzhong Ye, William R. Horwath. Effects of Microbial Biomass on the Priming Effects of Ryegrass on Native SOM Mineralization. *Soil Science Society of America, Phoenix, AZ, Nov*. 2016
8. **Xia Zhu-Barker**. The mitigation potential of GHG emissions in California cropping systems. Subsurface Drip Irrigation workshop, San Diego, May 17, 2016
9. Mengyang You, **Xia Zhu-Barker**, William Horwath. Stability of co-precipitated dissolved organic carbon and ferric iron under different clay mineralogy. *Soil Science Society of America, Minneapolis, MN, Nov.* 2015
10. **Xia Zhu-Barker**, Martin Burger, William R. Horwath. The effect of ammonium concentration on gross nitrification rate and N2O production pathways. *Soil Science Society of America, Minneapolis, MN, Nov.* 2015
11. **Xia Zhu-Barker,** William R. Horwath. The role of iron in the production of N2O in soils. *Institute of Agricultural Resources and Regional Planning*, *Chinese Academy of Agricultural Sciences, Beijing*, China, Sept. 11, 2015. **Invited Talk**
12. **Xia Zhu-Barker**. The contribution of agriculture to greenhouse gas N2O emissions and mitigation strategies. Mollisols Utilization and Conservation Workshop (Harbin, China, September 7-9, 2015). **Invited Talk**
13. **Xia Zhu-Barker**, William R. Horwath. The role of iron and manganese in abiotic nitrous oxide production in soil and aquatic ecosystems. International Conference of Nitrification (Edmonton, Alberta, Canada, June 2015). **Invited Plenary Talk**
14. **Xia Zhu**, Martin Burger, William R. Horwath. How to optimize the management of organic waste materials in sustainable agricultural system: a study on soil N2O emissions. *Institute of Genetics and Developmental Biology, Chinese Academy of Sciences*, Shijiazhuang, China, Dec. 30, 2014. **Invited Talk**
15. **Xia Zhu**, Martin Burger, William R. Horwath. The sources and mechanisms of soil N2O emission: implications for the use of organic waste materials in sustainable nitrogen management. *Agro-Environmental Protection Institute, Ministry of Agriculture, Tianjin*, *China*, Dec. 24, 2014. **Invited Talk**
16. **Xia Zhu**, Martin Burger, William R. Horwath. Implications for the use of organic waste materials in sustainable nitrogen management in agricultural systems.  *Institute of Agricultural Resources and Regional Planning*, *Chinese Academy of Agricultural Sciences, Beijing*, China, Dec. 21, 2014. **Invited Talk**
17. William R. Horwath, **Xia Zhu**, Timothy Doane, Martin Burger. Understanding the sources and mitigation potential of nitrous oxide in agriculture. AGU Fall Meeting, (San Francisco, CA, Dec. 2014). **Invited Talk**
18. **Xia Zhu**, Martin Burger, Hannah Waterhouse, William R. Horwath. The Effect of N fertilizer concentration on Soil O2 Consumption and N2O Production. *Soil Science Society of America* (Long Beach, CA, November 2014)
19. **Xia Zhu**, Timothy Doane, Lucas Silva, William R. Horwath. [Iron: The Forgotten Driver of Nitrous Oxide Production in Agricultural Soil](https://scisoc.confex.com/scisoc/2014SES/webprogram/Paper84607.html). *SSSA Ecosystem Services Conference* (Sacramento, CA, March 2014)
20. **Xia Zhu**, Martin Burger, William R. Horwath. Factors and Mechanisms Controlling Emission of Nitrous oxide from Soil. *Northwest A& F University, China*, June 17th, 2013. **Invited Talk**
21. **Xia Zhu**, Martin Burger, William R. Horwath. A new perspective of nitrogen cycling: The future of organic fertilizer and biosolids. *Agro-Environmental Protection Institute, Ministry of Agriculture, China,* June 13th, 2013. **Invited Talk**
22. **Xia Zhu**, William R. Horwath. Investigate nitrogen cycling and nitrogen use efficiency in diverse agricultural systems by using tracer and natural abundance stable isotope techniques. *Northeast Institute of Geography and Agro-ecology, Chinese Academy of Sciences, China,* June 11th, 2013. **Invited Talk**
23. **Xia Zhu**, Martin Burger, William R Horwath. N2O production via nitrifier denitrification under low oxygen availability. *Soil Science Society of America* (Cincinnati, OH, October 2012).
24. **Xia Zhu**, Xiaozeng Han. Influence of Soluble Carbon and Nitrogen on Ammonia Volatilization from Different Thermal Zones Soil. *National conference of academician delegates of Chinese Society of Soil Science* (Beijing, China, Sep 2008). **Invited Talk**
25. **Xia Zhu**, Xiaozeng Han. The Characteristics of Nitrogen Use Efficiency and Soil Nitrogen supplying after Long-term Fertilization in Black Soil. International Conference on Long-Term Ecological Research (Harbin,China, August 2007).
26. **Xia Zhu**, Xiaozeng Han. Effects of Land Use on Nitrogen Content in Black Soil. International workshop on understanding of ecological processes and functions in soil (Nanjing, China, June 2006).

**POSTER PRESENTATIONS**

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1. **Xia Zhu-Barker,** Qiong Yi, Chunying Xu, William Horwath. Responses of soil organic matter stability, N transformation processes and nitrous oxide production to compost application in long-term sustainable managed soils. *American Geophysical Union* *fall meeting* (December 2019, San Francisco, CA)
2. Nazanin Akramin, **Xia Zhu-Barker**, William R. Horwath. Mitigating Climate Change Through the Understanding of Nitrous oxide Consumption Potential in Peatlands. *American Geophysical Union* (New Orleans, LA. December 2017)
3. **Xia Zhu-Barker**, Cong Wang, William R. Horwath.The Effect of Green Waste Compost on Nitrous Oxide Production Under Different Temperatures. *Soil Science Society of America* (Phoenix, AZ, Nov. 2016)
4. **Xia Zhu**, Timthy A. Doane, Martin Burger, William R. Horwath. The impact of iron on soil N2O production depends on O2 availability. *American Geophysical Union* (San Francisco, CA December 2014)
5. **Xia Zhu**, Martin Burger, Peter G. Green, William R. Horwath. Greenwaste: How to Reduce its Impacts on Greenhouse Gas Emissions and Nitrate Leaching Potential?*Soil Science Society of America* (Long Beach, CA, November 2014)
6. **Xia Zhu**, Martin Burger, Hanna Waterhouse, William R. Horwath. The effect of ammonical N fertilizer concentration on soil O2 consumption and N2O production pathways. *Complex Soil System conference* (Lawrence National Lab & UCBerkeley, September 2014, POSTER)
7. **Xia Zhu**, Martin Burger, William R Horwath. Ammonia oxidation pathways and nitrifier denitrification are significant sources of N2O and NO under low oxygen availability. *Climate-Smart Agriculture Conference* (UCDavis, Davis, CA, March 2013, POSTER)
8. **Xia Zhu**, Martin Burger, William R Horwath. Nitrifier denitrification as a main pathway of N2O under limiting O2 concentration. *American Geophysical Union* (San Francisco, CA, Dec 2012, POSTER). **Invited**
9. **Xia Zhu**, Martin Burger, Timthy A Doane, William R Horwath. Influence of oxygen availability on N2O pathways. *Ecological Society of America* (Portland, Oregon, August 2012, POSTER).
10. **Xia Zhu**, Martin Burger, William R Horwath. N2O production pathways and its factor. *Western of Soil Science Society of America* (Davis, CA, Jun 2012, POSTER).
11. **Xia Zhu**, Martin Burger, Timthy A Doane, William R Horwath. The effect of nitrogen fertilizer and O2 on N2O emission. *Soil Science Society of America* (San Antonio, TX, October 2011, POSTER).

**FELLOWSHIPS & AWARDS**

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* Travel Caregive Award, Soil Science Society of American, 2019. $500
* Research Travel Award , The University of California Davis, 2019-2020. $800
* Stable Isotope Facility 2019 Pilot Project Grant Program award. $1,000
* 2018 Editor's Citation for Excellence REVIEWER. The editorial board of Soil Science Society of America Journal recognizes.
* Excellent Young Scientist Award, *2016*. Association of Chinese Soil & Plant Scientists in North America.
* Ministry of Agriculture China Talents Travel Award, *2014*. $5,000.
* Chinese Academy of Sciences President Award, *July 2013*. $ 1,000.
* Outstanding Student Paper Award *in American Geophysical Union, December 2012.*
* The first place winner of poster competition at the *Western Soil Science Society of America, June 2012.* $200.
* Chinese Oversea Scholarship, *June 2010*. $40,000.

**SERVICE**

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* **Associate Editor** *of the Journal of Environmental Quality. April 1, 2018-Dec. 31, 2020*
* Specialty Crop Block Grant Program **Technical Review Committee,** CDFA. 2018-2019
* Healthy Soil Program **Technical Review Committee,** CDFA. 2018-2019
* **Journal Reviewer** of *Biogeochemistry*, *Soil Science Society of America Journal, Applied and Environmental Soil Science, Environmental Management, Journal of Dairy Science, PlosOne, Environmental Science of Technology, The Science of the total Environment, Scientific Report,* *Journal of Integrative Agriculture, Waste Management, Field Crop Research, Sustainability, European Journal of Soil Biology, Journal of Environmental Quality, Journal of Environmental Sciences, Soil Biology and Biochemistry*
* **Judge** for the student presentation competition in Soil Science Society of America Annual Meetings, 2014, American Geophysical Union Annual Meeting, 2014 & 2016
* **Member of the Committee** on Professional Development, UC Davis. Sept. 2017-August 31, 2018.
* **Chair** of Professional Development Committee, UC Davis. Sept 2018-Aug. 2020

**PROFESSIONAL AFFILIATIONS**

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* Soil Science Society of America (SSSA)
* American Geophysical Union (AGU)
* Ecological Society of America (ESA)
* American Chemical Society (ACS)

**PROFESSIONAL DEVELOPMENT**

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* Summer Insitute on Scientific Teaching. July 15- 19, Yale Center for TReaching and Learning Regional site in Eugene, Oregon.
* Move Your Teaching Ahead with Backward Design Workshop. January 6, 2019. Soil Science Society, San Diego, CA.
* The safe, sensible, shared classroom: Negotiating the labor of learning. Winter Quarter 2018 Teaching Workshop series (six 2-hour workshops), UC Davis Center for Educational Effectiveness, Jan 16- March 6, 2018.
* Teaching workshop series for Faculty (four 1.5-hour workshops). Jan 26- March 2, 2018.
* Writing in the Sciences, Stanford University, online course, September 2014.
* National Science Foundation Day at University of California Davis, Davis, CA, April 2013.
* Grant Writers’ Seminars and Workshop: How to Submit Successful Proposals to Any Agency, sponsored by National Science Foundation, Davis, CA, 2012.