TIANMEI WANG

Ph.D. Candidate, Department of Earth System Science, Stanford University

Email: tmwang@stanford.edu   **Website:** https://tianmeiw.github.io

EDUCATION

Stanford University   Sep. 2017 - present
Ph.D. in Earth System Science   *Advisor: Prof. Scott Fendorf*

Dissertation: Unraveling and Predicting the Coupled Impacts of Climate Change and Soil Arsenic on Rice Yield and Grain Quality

Stanford University   Sep. 2015 - June 2017
M.S. in Civil and Environmental Engineering

Shanghai Jiao Tong University   Sep. 2011 - July 2015
B.S.E. in Environmental Science and Engineering

Thesis: Factors Influencing the Fate and Transformation of C60 Nanocrystallines in Aqueous System

Technical University of Munich   Oct. 2013 - March 2014
Exchange student with DAAD scholarship, Department of Civil, Geo and Environmental Engineering

HONORS AND AWARDS

1st place in student oral competition, 2021 ASA,CSSA,SSSA International Annual Meeting	2021
Stanford King Center on Global Development Graduate Student Fellowship	2021-2022
Data Science for All (DS4A) Fellowship by Correlation One	2021
Rising Environmental Leaders Program, Stanford Woods Institute	2021
Stanford Earth Certificate for Outstanding Mentoring	2020
Stanford Big Earth Data Hackathon, Second Prize, Best use of Planet Data [project]	2018
National Scholarship (the Ministry of Education, China)	2013
Kontaktstipendium (DAAD Scholarship for International Exchange Student)	2013

PUBLICATIONS

PEER-REVIEWED JOURNAL

2. **Wang, T.**, Muehe, E.M., Jin, Z., Yin, Z., Fendorf, S. "Disproportionate nonlinear impact of coupled heat stress and soil arsenic on rice yields." , under review.

1. Muehe, E.M., **Wang, T.**, Kerl, C., Planer-Friedrich, B., Fendorf, S. "Rice production threatened by coupled stresses of climate and soil arsenic." *Nat.Commun.*, **10**, 1–10 (2019). [pdf]
   Coverage: Top 50 read articles in *Nat Commun.*, Stanford News

GRANT AWARDED

5. McGee Grant, **$3100**	2020
4. Shell Fund Research Grant, **$625**	2019
3. Stanford Earth Summer Undergraduate Research Program(SESUR), **$7500** (as mentor)	2018, 2019, 2020

2. Stanford King Center on Global Development Graduate Student Research Funding, **PI-$24943**, "Coupled Effects of Climate and Soil Arsenic on Rice Yield and Quality in China"[link] [news] 2018

1. Kontaktstipendium, scholarship for exchange student from the German Academic Exchange Service (DAAD), **€3000** ($\sim$ $4000) 2013

CONFERENCE PRESENTATIONS

8. **Wang, T.**, E.M. Muehe and S.E. Fendorf, "Unraveling the Impact of Climate Change and Soil Arsenic on Bangladeshi Rice Production" 2022 American Geophysical Union Fall Meeting, Chicago, IL (oral)

7. **Wang, T.**, E.M. Muehe and S.E. Fendorf, "Disproportionate Nonlinear Impact of Coupled Heat Stress and Soil Arsenic on Rice Yields" 2021 ASA,CSSA,SSSA International Annual Meeting, Salt Lake City, UT (oral), 1st place in student oral competition

6. **Wang, T.**, E.M. Muehe and S. Fendorf, "Diminished Rice Yield by Coupled Impact of Climate Change and Soil Arsenic Contamination" 2020 Goldschmidt Conference (oral)

5. **Wang, T.**, E.M. Muehe and S.E. Fendorf, "Climate Change Couples with Soil Arsenic to Exacerbate Diminished Rice Yields" 2019 American Geophysical Union Fall Meeting, San Francisco, CA (oral)

4. Jain R.*, A. Hamann, **T. Wang**, and S.E. Fendorf, "Effect of Arsenic Coupled with Climate Change on Rice Yield and Grain Quality" 2019 American Geophysical Union Fall Meeting, San Francisco, CA (poster)

3. **Wang, T.**, E.M. Muehe and S.E. Fendorf, "Coupled Climatic and Soil Arsenic Stressors Threaten Future Rice Yields" 2018 American Geophysical Union Fall Meeting, Washington D.C. (poster)

2. **Wang, T.**, M. Plaganas, E.M. Muehe and S.E. Fendorf, "Productivity of Rice Grown on Arsenic Contaminated Soil under a Changing Climate" 2016 American Geophysical Union Fall Meeting, San Francisco, CA (poster)

1. Plaganas M.*,**T. Wang**, E.M. Muehe and S.E. Fendorf, "Pore Water Arsenic Dynamics in Rice Paddies Under Projected Future Climates" 2016 American Geophysical Union Fall Meeting, San Francisco, CA (poster)
   (* denotes student mentee)

RESEARCH EXPERIENCE

Coupled Impact of Climate Change and Soil Arsenic on Rice Yield and Quality 2016 -present

- Conducted greenhouse rice plant mesocosm experiment on Californian and Bangladeshi rice variety
- Analyzed porewater geochemistry and plant physiology over growing season
- Analyzed toxins and nutrient contents in harvest grains
- Maintained a greenhouse system to fully control CO2, temperature, and automated irrigation
- Built a statistical model to investigate the interactions of temperature and soil on rice yield
- Showed that yield loss of coupled impact of climate change and soil As on Bangladeshi rice is comparable to Californian rice

Prediction of Soil Heavy Metal Contamination from Remote Sensing Imagery 2018 -present

- Awarded $24K Graduate Student Research Grant from Stanford King Center on Global Development
- Flew UAV with multispectral sensor in California and Hunan in China over rice paddies
- Led and designed field sampling campaign for plant tissues and soil sample
- Constructed machine learning models including Regressions, Random Forest, Gradient Boosting Decision Tree to predict arsenic in plant tissues and soils from UAV remote sensing

- Extracted remote sensing satellite images of Sentinel-2 in Google Earth Engine and used TensorFlow to construct convolutional neural networks to predict metal pollution in soils

Impact of Climate Change and Soil Arsenic on Historical Bangladeshi Rice Yield 2021 -present

- Conducted panel regression with fixed effect on historical Bangladeshi rice yield dataset and investigate the role of precipitation, temperature and soil As

PROFESSIONAL SERVICE

Referee for: *Environmental Pollution, Soil Systems, Science of the Total Environment, Plos One*

TEACHING EXPERIENCE

Teaching Assistant for courses:

ESS 233: Mitigating Climate Change through Soil Management 2021 Winter

ESS 155/255: Science of Soils 2021 Spring, 2022 Spring

MENTORING, LEADERSHIP & OUTREACH

Research lead for Documentary Film: Grounded 2020 Dec. -present

- Lead a group of 10 people to conduct research for the feature-length documentary on the impact and possible solutions of climate change on future agriculture and food systems

Undergraduate and High School Student Research Mentor 2016 - present

- Stanford King Center Undergraduate Research Program
  Sonya Epifantseva (2022)

- Stanford Earth Summer Undergraduate Research Program (SESUR)
  Hyunseok Hwang (2018), Olivia Kline (2019)

- Stanford Summer Undergraduate Research in Geoscience and Engineering Program (SURGE)
  Mariejo Plaganas (2016), Marcus Hill (2018), Valeria Nava (2019)

- Stanford Earth Young Investigators (High School Student Research Internship Program)
  Sindhu Goli (2018), Rishi Jain(2019)

Panelist for Life as a ESS Ph.D. Discussion Feb. 2020

Student Mentor for First Year Graduate Student in Department of Earth System Science 2018 - 2019

Research Chair for Stanford American Society of Civil Engineers (ASCE) Student Chapter 2015 - 2016
Promote research interest in undergraduate and graduate student; connect students to faculties; advise CEE undergraduate student on course selection and internship application; invite industry partners for seminars and recruiting

Zero-waste Volunteer at Peninsula Sanitary Service Inc.(PSSI)/ Stanford Recycling Center 2015 - 2016
Assess efficiency of desk-side trash bin program through waste audit; facilitate more installation of compost bins in Stanford buildings; outreach to primary school students for trash classification and sustainable lifestyle; help promote trash recycle rate at Stanford in RecycleMania competition.

SKILLS

Wet Lab: ICP-OES, ICP-MS, TOC, DA, XRF, SEM/TEM, XAS, IC, GC, UV/Vis

Programming and Software: python, R, ArcGIS, ENVI, Google Earth Engine, MODFLOW, Geochemist's workbench, machine learning, statistical models

Others: Greenhouse rice plant mesocosm, soil incubation, field work, UAV and satellite remote sensing

WORKSHOP AND CERTIFICATION

Wilderness First Aid Certificate by Stanford Medicine	2021
"Enahncing STEM Education with Drones" Embry-Riddle Aeronautical University MOOC	2020
FAA Part 107 Remote Pilot Certificate	2019
UC ANR DroneCamp	2019
E.I.T.Engineer in Training, Board for Professional Engineers, Land Surveyors, and Geologists	2017