

Fang Zhao

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RESEARCH INTERESTS

- Water and carbon cycle at global and regional level
- Flood and droughts simulation and impact
- Anthropogenic Influence on biosphere, land atmosphere and ocean
- Climate change and Earth system modeling
- Extreme climate events and their impacts

EDUCATION

- 2011-2015 **Ph.D. (Atmospheric and Oceanic Science)** University of Maryland-College Park, MD, USA
Advisors: Prof. Ning Zeng and Eugenia Kalnay
- 2009-2011 **M.S. (Geography)** The University of Georgia-Athens, GA, USA
Advisor: Prof. J. Marshall Shepherd
- 2005-2009 **B.S. (Geography)** Peking University, China

PROFESSIONAL EXPERIENCE

- 2016 **Member of ISIMIP coordination team (isimip.org)** Potsdam Institute for Climate Impact
Research, Potsdam, Brandenburg, Germany Supervisor: Dr. Katja Frieler
- 2015 **Postdoctoral Researcher** University of Maryland, College Park, MD, USA
Supervisor: Prof. Ning Zeng
- 2015 **Graduate Teaching Assistant** University of Maryland, College Park, MD, USA
(AOSC123: Causes and Consequences of Global Change)
- 2011-2015 **Graduate Research Assistant** University of Maryland, College Park, MD, USA
- 2009-2011 **Graduate School Assistantship** University of Georgia, Athens, GA, USA

PUBLICATION/PRESENTATIONS

Peer Reviewed Journal Publications

In review/Submitted

1. Dottori F., W. Szewczyk, J.C. Ciscar, and coauthors including **F. Zhao**, 2017: Global human and economic losses from river floods under the Paris climate mitigation targets. (In revision in *Nature Climate Change*)
2. Willner, S.N., A. Levermann, **F. Zhao**, K. Frieler, 2017: Adaptation required to preserve future high-end flood risk at present level. (In revision in *Scientific Reports*)
3. Lange, S., J. Volkholz, T. Geiger, **F. Zhao**, and coauthors, 2017: The climate change signal in natural disasters. (Submitted to *Science*).
4. Schewe J., Elliott J., Francois L., and coauthors including **F. Zhao**, 2017: Simulating the compound impacts of climate extremes: Lessons from the 2003 European heat wave and drought. (Submitted to *Proceedings of the National Academy of Sciences*)

Published/Accepted

1. **Zhao, F.**, T.I.E. Veldkamp, K. Frieler and coauthors, 2017: The critical role of the routing scheme in simulating peak river discharge in global hydrological model. *Environmental Research Letters*, 12:

- 075003.
2. Zeng, N., **F. Zhao**, G.J. Collatz, E. Kalnay, R.J. Salawitch, T.O. West, and L. Guanter, 2014: Agricultural Green Revolution as a driver of increasing atmospheric CO₂ seasonal amplitude. *Nature*, 515: 394–397.
 3. **Zhao, F.**, N. Zeng, and coauthors, 2016: Role of CO₂, climate and land use in regulating seasonal amplitude increase of carbon fluxes in terrestrial ecosystems: a multimodel analysis. *Biogeosciences*, 13: 5121–5137.
 4. **Zhao, F.** and N Zeng, 2014: Continued increase in atmospheric CO₂ seasonal amplitude in the 21st century projected by the CMIP5 Earth system models. *Earth System Dynamics*, 5, 423–439.
 5. Frieler, K., R. Betts, E. Burke, P. Ciais, and coauthors including **F. Zhao**, 2017: Assessing the impacts of 1.5°C global warming – simulation protocol of the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP2b). *Geoscientific Model Development* (Accepted).
 6. Chen M, Rafique R, Asrar G R, and coauthors including **F. Zhao**, 2017: Regional contribution to variability and trends of global gross primary productivity. *Environmental Research Letters*, 12 105005
 7. Huntzinger, D.N., A. M. Michalak, C. Schwalm, and coauthors including **F. Zhao**, 2017: Uncertainty in the response of terrestrial carbon sink to environmental drivers undermines carbon-climate feedback predictions. *Scientific Reports* 7: 4765.
 8. Chang, J., P. Ciais, X. Wang, and coauthors including **F. Zhao**, 2017: Benchmarking carbon fluxes of the ISIMIP2a biome models. *Environmental Research Letters*, 12: 045002.
 9. Ito A., K. Nishina, C. Reyer, and co-authors including **F. Zhao**, 2017: Photosynthetic productivity and its efficiencies in ISIMIP2a biome models: benchmarking for impact assessment studies. *Environmental Research Letters*, 12: 085001.
 10. Rafique, R., **F. Zhao**, R. de Jong, N. Zeng and G. Asrar, 2016: Global and Regional Variability and Change in Terrestrial Ecosystems Net Primary Production and NDVI: A Model-Data Comparison. *Remote Sensing*, 8(3), 177.
 11. Li, Y., Zhao, M., Mildrexler, D. J., and coauthors including **F. Zhao**: Potential and Actual impacts of deforestation and afforestation on land surface temperature. *Journal of Geophysical Research: Atmospheres*, 2016JD024969, doi:10.1002/2016JD024969, 2016.
 12. Ito, A., and coauthors including **F. Zhao**, 2016: Decadal trends in the seasonal-cycle amplitude of terrestrial CO₂ exchange resulting from the ensemble of terrestrial biosphere models. *Tellus B*, 68(1), 1–20.
 13. Peng, S., P. Ciais, F. Chevallier, and coauthors including **F. Zhao**, 2015: Benchmarking the seasonal cycle of CO₂ fluxes simulated by terrestrial ecosystem models. *Global Biogeochemical Cycles*, 29(1), 47-64.
 14. Mao, J., Fu, W., Shi, X., and coauthors including **F. Zhao**: Disentangling climatic and anthropogenic controls on global terrestrial evapotranspiration trends. *Environmental Research Letters*, 10(9), 094008.
 15. Yang, H., Z. Zeng, P. Ciais, and coauthors including **F. Zhao**, 2015: Multi-criteria evaluation of discharge simulation in Dynamic Global Vegetation Models. *Journal of Geophysical Research: Atmospheres*, 2: 7488-7505.
 16. Huntzinger, D.N., C. Schwalm, A.M. Michalak, and coauthors including **F. Zhao**, 2013: The North American Carbon Program Multi-scale synthesis and Terrestrial Model Intercomparison Project: Part I - Overview and experimental design. *Journal of Geoscientific Model Development* 6: 2121-2133.
 17. Eby, M., A.J. Weaver, K. Alexander, and coauthors including **F. Zhao**, 2013: Historical and idealized climate model experiments: an EMIC intercomparison. *Climate of the Past* 9: 1111-1140.
 18. Zickfeld, K., and coauthors including **F. Zhao**, 2013: Long-term Climate Change Commitment and Reversibility: An EMIC Intercomparison. *Journal of Climate* 26: 5782–5809.
 19. **Zhao, F.** and J.M. Shepherd, 2012: Precipitation changes near Three Gorges Dam, China-part I: A spatio-temporal validation analysis. *Journal of Hydrometeorology* 13: 735-745.

20. **Zhao, F.**, H. Deng, X.Y. Zhao, 2010: Rainfall regime in Three Gorges area in China and the control factors. *International Journal of Climatology* 30: 1396-1406.
21. Deng, H., **F. Zhao**, and X.Y. Zhao, 2012: Changes of extreme temperature events in Three Gorges Area, China. *Environmental Earth Science* 66: 1783-1790.
22. Grundstein, A., C. Ramseyer, **F. Zhao**, and coauthors, 2011: A retrospective analysis of American football hyperthermia deaths in the United States. *International Journal of Biometeorology* 56: 11-20.

Conference Presentations

1. **Zhao, F.**, and co-authors, 2017: Choice of routing scheme considerably influences peak river discharge simulation in global hydrological models. 2017 European Geological Union Annual Meeting, Vienna, Austria.
2. Frieler, K., and co-authors including **F. Zhao** (presenting) 2016: Assessing the impacts of 1.5°C of global warming – The Inter-Sectoral Impact Model Intercomparison Project (ISIMIP) approach. 2014 American Geological Union Fall Meeting, San Francisco, CA.
3. Rafique, R., **F. Zhao** (presenting), R. de Jong, N. Zeng and G. Asrar 2016: Multi-scale evaluation of ISIMIP biome models against NDVI and MODIS NPP data. 2016 European Geological Union Annual Meeting, Vienna, Austria.
4. **Zhao, F.**, and N. Zeng, 2014: Continued increase in atmospheric CO₂ seasonal amplitude in the 21st century projected by the CMIP5 Earth system models. 5th NACP Principal Investigators Meeting, Washington D.C., USA.
5. Zeng, N., **F. Zhao** (presenting), G.J. Collatz, E. Kalnay, R.J. Salawitch, T.O. West, and L. Guanter, 2014: The ever-increasing CO₂ seasonal cycle amplitude: contributions from high latitude warming, CO₂ fertilization, and the agricultural Green Revolution. 2014 American Geological Union Fall Meeting, San Francisco, CA, USA.
6. **Zhao, F.**, and N. Zeng, 2014: Continued increase in atmospheric CO₂ seasonal amplitude in the 21st century projected by the CMIP5 Earth system models. 2014 American Geological Union Fall Meeting, San Francisco, CA, USA.
7. **Zhao, F.**, and J.M. Shepherd, 2014: Analyzing the Impact of the Three Gorges Reservoir on Local Precipitation with TRMM Satellite Data. 94th American Meteorological Society Annual Meeting, Atlanta, GA, USA.
8. **Zhao, F.**, N. Zeng, S. Motesharrei, and coauthors, 2013: Simulating Freshwater Availability under Future Climate Conditions. 2013 American Geological Union Fall Meeting, San Francisco, CA, USA.
9. **Zhao, F.**, and N. Zeng, 2013: Simulating the terrestrial CO₂ seasonal cycle. The 9th International Carbon Dioxide Conference, Beijing, China.
Zhao, F., and J.M. Shepherd, 2011: Precipitation changes near Three Gorges Dam. Association of American Geographers Annual Meeting, Seattle, WA, USA.
10. **Zhao, F.** 2010: Precipitation changes near Three Gorges dam. Poster presented at the 2010 Annual Meeting of Southeastern Division of the Association of American Geographer, Birmingham, AL, USA.
11. **Zhao, F.** and J.M. Shepherd, 2010: Three Gorges dam management: in the face of altered Precipitation. Poster presented at the 2010 Lower Apalachicola-Chattahoochee-Flint (ACF) Water Conference and Summit: Managing reservoirs from a human and Ecological perspective, Bainbridge, GA, USA.

HONORS AND AWARDS

2015	Eugene Rasmusson Graduate Student Fellowship Award
2014	GRID Travel Award, University of Maryland-College Park.
2013	Green Fund Award, University of Maryland-College Park.
2011.2013	CMNS Dean's Fellowship, University of Maryland-College Park.
2009.2010	Graduate School Assistantship, University of Georgia. (Fellowship, highly competitive).

2008	China Educational Foundation for Undergrads of Sciences Grant.
2007.2008	Wu Si Scholarship, Peking University.
2007	Peking University President Grant.
2006	Award of Social Work, Peking University.

RESEARCH EXPERIENCE

2016	Research on evaluating multi-model performance in flood simulation and assessing impact of future flood using ISIMIP model results
2014-2015	Research on multi-model comparison of simulated atmospheric CO ₂ seasonal amplitude
2013-2014	Research on modeling the agricultural green revolution and analyzing its impact on atmospheric CO ₂ seasonal amplitude
2011-2014	International TRENDY Project and Global Carbon Budget 2013
2012-2013	North American Carbon Program (NACP) Multiple Scale Terrestrial Model Intercomparison Project (MstMIP)
2012	MstMIP Workshop II at the Oak Ridge National Laboratory in Oak Ridge, Tennessee
2012	IPCC EMICAR5 (Earth System Models of Intermediate Complexity) Project

PUBLIC SERVICES

- **Reviewer** for Atmospheric Measurement Techniques, Journal of Applied Meteorology and Climatology, Journal of Climatology, Earth Interactions, Earth System Dynamics, Journal of Geophysical Research, Global Environmental Change
- **Volunteer** in 9th International Carbon Dioxide Conference
- **Volunteer** in 38th NOAA Climate Diagnostic and Prediction Workshop

PROFESSIONAL MEMBERSHIPS

2016-pres	European Geophysical Union (EGU)
2014-pres	American Meteorological Society (AMS)
2013-pres	American Geophysical Union (AGU)
2009-2011	Association of American Geographers (AAG)

TECHNICAL SKILLS

- Numerical model development (UMD-River Routing Model)
- Global model simulation using CaMa-Flood and UMD-Earth System Model (VEGAS, etc.)
- Mass data processing and supercomputing
- Programming in Fortran, Python, Grid Analysis and Display System (GrADS), UNIX Shell Scripting (experienced); MATLAB, IDL, C, R (moderate level)
- Experiment skills including ecological field surveys, tree-ring sampling, weather balloon launching and mobile weather station operation

REFERENCES

- 1- **Dr, Katja Frieler**, Potsdam Institute for Climate Impact Research, Potsdam, Germany.
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- 2- **Prof, Ning Zeng**, University of Maryland, College Park, MD, USA.
Email: zeng@umd.edu; Phone: + 1 (301) 405 5377; Web: <http://www.atmos.umd.edu/~zeng/>
- 3- **Prof, Marshall Shepherd**, University of Georgia, Athens, GA, USA.
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