

Jiang Zhu

Postdoctoral Research Fellow
Department of Earth and Environmental Sciences
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RESEARCH INTERESTS

- Climate sensitivity and feedbacks
- ENSO variability in the past and future
- Role of ocean circulation in climate change
- Simulation and interpretation of geochemical tracers
- Global climate and hydroclimate changes

EDUCATION

Ph.D., Atmospheric and Oceanic Sciences University of Wisconsin-Madison, Madison, WI, USA Advisor: <i>Prof. Zhengyu Liu</i>	May 2017
M.S. Atmospheric and Oceanic Sciences Peking University, Beijing, China Advisor: <i>Prof. Haijun Yang</i>	Jun 2011
B.S. Atmospheric Sciences Peking University, Beijing, China	Jun 2008

RESEARCH EXPERIENCE

Postdoctoral Research Fellow, University of Michigan <i>Projects:</i> Climate sensitivity and feedback processes of Earth's past and future; Simulation of water isotopes and implications for past climate; Oceanic meridional overturning circulation in deep-time hothouse climates; Paleoclimate data assimilation for the Paleocene—Eocene Thermal Maximum and the last deglaciation	June 2017–present
Graduate Research Assistant, University of Wisconsin-Madison <i>Projects:</i> Interpretation and modeling of water isotopes; ENSO variability in the past and future; Holocene temperature conundrum; Abrupt climate changes and the large-scale ocean circulation	Aug 2011–May 2017
Visiting Scholar, National Center for Atmospheric Research <i>Projects:</i> Development and validation of the isotope-enabled Community Earth System Model (with focus on the sea ice, ocean, river runoff and the coupler)	Jan 2014–Jan 2015

PUBLICATIONS

- **Zhu, J.**, Poulsen, C. J., Otto-Bliesner, B. L., Liu, Z., Brady, E. C., & Noone, D. C. Simulation of early Eocene water isotopes using an Earth system model and its implication for past climate reconstruction. *Earth and Planetary Science Letters*, *in minor revision*.
- **Zhu, J.**, Poulsen, C. J., Otto-Bliesner, B. L. High climate sensitivity in CMIP6 models not supported by past warm climates. *submitted*.
- **Zhu, J.**, & Poulsen, C. J. On the temperature dependence of equilibrium climate sensitivity and cloud feedback in the Community Atmosphere Models. *to be submitted*.
- Tierney J., **Zhu, J.**, King, J., Malevich, Hakim, G., Poulsen, C. Glacial cooling and climate sensitivity revisited. *submitted*.
- He, C., Liu, Z., **Zhu, J.**, Zhang, J., Gu, S., Otto-Bliesner, B. L., . . . Sun, J. North Atlantic subsurface temperature response controlled by effective freshwater input in “Heinrich” events. *under review*.
- Wang, Y., Hendy, I., **Zhu, J.** Expansion of the Southern California oxygen minimum zone during the early- to mid-Holocene due to reduced ventilation of the Northeast Pacific. *Quat. Sci. Rev. submitted*.
- Du, X., Hendy, I., Hinnov, L., Brown, E., **Zhu, J.**, Poulsen, C.J. High-resolution interannual precipitation reconstruction of Southern California: Implications for Holocene ENSO evolution. *Earth Planet. Sci. Lett. submitted*.
- He, C., Liu, Z., Otto-Bliesner, B. L., Brady, E. C., Zhu, C., Thomas, R., Clark, P., **Zhu, J.** . . . Yan, M. (2019). Pan-Asian Monsoon Hydroclimate-Water Isotope Footprint during the Last Deglaciation. *submitted*.
- Liu, Y., Wu, Y., Lin, Z., Zhang, Y., **Zhu, J.**, & Yi, C. Climate Impact of the Tibetan Glacier Expansion during the Last Glacial Maximum Simulated by CAM4. *in revision*.
- Tierney, J.E., Poulsen, C.J., Montanez, I.P., Bhattacharya, T., Feng, R., Ford, H.L., Honisch, B., Inglis, G.N., Petersen, S. V., Sagoo, N., Tabor, C.R., Thirumalai, K., **Zhu, J.**, Burls, N.J., Godderis, Y., Foster, G.L., Huber, B.T., Ivany, L.C., Turner, S.K., Lunt, D.J., McElwain, J.C., Mills, B.J.W., Otto-Bliesner, B.L., Ridgwell, A., Zhang, Y.G. The Future of Past Climate: Review Summary. *under review*.
- 25. Lunt, D. J., Bragg, F., Chan, W. L., Hutchinson, D. K., Ladant, J. B., Niezgodzki, I., Steinig, S., Zhang, Z., **Zhu, J.**, Abe-Ouchi, A., de Boer, A. M., Coxall, H. K., Donnadieu, Y., Knorr, G., Langebroek, P. M., Lohmann, G., Poulsen, C. J., Sepulchre, P., Tierney, J., Valdes, P. J., Dunkley Jones, T., Hollis, C. J., Huber, M., & Otto-Bliesner, B. L. (2020). DeepMIP: Modelled large-scale features and model-data comparison for the early Eocene climatic optimum (EECO). *Clim. Past Discuss.*, 1-27. <https://doi.org/10.5194/cp-2019-149>
- 24. **Zhu, J.**, & Poulsen, C. J. (2019). Quantifying the cloud particle-size feedback in an Earth system model. *Geophysical Research Letters*, 46, 10910–10917. <https://doi.org/10.1029/2019GL083829>
- 23. **Zhu, J.**, Poulsen, C. J., & Tierney, J. E. (2019). Simulation of Eocene extreme warmth and high climate sensitivity through cloud feedbacks. *Science Advances*, 5(9), eaax1874. <https://doi.org/10.1126/sciadv.aax1874> ([news release](#))

22. Brady, E. C., Stevenson, S., Bailey, D., Liu, Z., Noone, D., Nusbaumer, J., . . . **Zhu, J.** (2019). The connected isotopic water cycle in the Community Earth System Model version 1. *Journal of Advances in Modeling Earth Systems*, 11, 2547–2566. <https://doi.org/10.1029/2019MS001663>
21. Thompson, A. J., Skinner, C. B., Poulsen, C. J., & **Zhu, J.** Modulation of mid-Holocene African rainfall by dust aerosol direct and indirect effects. *Geophysical Research Letters*, 46(7), 3917–3826. <https://doi.org/10.1029/2018GL081225>
20. Thibodeau, B., Not, C., **Zhu, J.**, Schmittner, A., Noone, D., Tabor, C., . . . Liu, Z. (2018). Last century warming over the Canadian Atlantic shelves linked to weak Atlantic Meridional Overturning Circulation. *Geophysical Research Letters*, 45(22), 12–376. <https://doi.org/10.1029/2018GL080083>
19. Lu, Z., Liu, Z., **Zhu, J.**, & Cobb, K. M. (2018). A Review of Paleo El Niño-Southern Oscillation. *Atmosphere*, 9(4), 130. <https://doi.org/10.3390/atmos9040130>
18. Liu, Y., Zhang, M., Liu, Z., Xia, Y., Huang, Y., Peng, Y., & **Zhu, J.** (2018). A Possible Role of Dust in Resolving the Holocene Temperature Conundrum. *Scientific Reports*, 8(1), 4434. <https://doi.org/10.1038/s41598-018-22841-5>
17. Tabor, C. R., Otto-Bliesner, B. L., Brady, E. C., Nusbaumer, J., **Zhu, J.**, Erb, M. P., . . . Noone, D. (2018). Interpreting Precession-Driven $\delta^{18}\text{O}$ Variability in the South Asian Monsoon Region. *Journal of Geophysical Research: Atmospheres*, 123(11), 5927–5946. <https://doi.org/10.1029/2018JD028424>
16. **Zhu, J.**, Liu, Z., Brady, E. C., Otto-Bliesner, B. L., Marcott, S. A., Zhang, J., . . . Noone, D. (2017). Investigating the direct meltwater effect in terrestrial oxygen-isotope paleoclimate records using an isotope-enabled Earth system model. *Geophysical Research Letters*, 44(24), 12501–12510. <https://doi.org/10.1002/2017GL076253>
15. **Zhu, J.**, Liu, Z., Brady, E., Otto-Bliesner, B., Zhang, J., Noone, D., . . . Tabor, C. (2017). Reduced ENSO variability at the LGM revealed by an isotope-enabled Earth system model. *Geophysical Research Letters*, 44(13), 6984–6992. <https://doi.org/10.1002/2017GL073406>
14. Liu, W., Xie, S.-P., Liu, Z., & **Zhu, J.** (2017). Overlooked possibility of a collapsed Atlantic Meridional Overturning Circulation in warming climate. *Science Advances*, 3(1), e1601666. <https://doi.org/10.1126/sciadv.1601666>. (*news release*)
13. Lu, Z., Liu, Z., & **Zhu, J.** (2016). Abrupt intensification of ENSO forced by deglacial ice-sheet retreat in CCSM3. *Climate Dynamics*, 46(5–6), 1877–1891. <https://doi.org/10.1007/s00382-015-2681-3>
12. Guan, J., Liu, Z., Wen, X., Brady, E., Noone, D., **Zhu, J.**, & Han, J. (2016). Understanding the temporal slope of the temperature-water isotope relation during the deglaciation using isoCAM3: The slope equation. *Journal of Geophysical Research: Atmospheres*, 121, 10,342–10,354. <https://doi.org/10.1002/2016JD024955>
11. Wen, X., Liu, Z., Wang, S., Cheng, J., & **Zhu, J.** (2016). Correlation and anti-correlation of the East Asian summer and winter monsoons during the last 21,000 years. *Nature Communications*, 7, 11999. <https://doi.org/10.1038/ncomms11999>

10. **Zhu, J.**, Liu, Z., Zhang, J., & Liu, W. (2015). AMOC response to global warming: dependence on the background climate and response timescale. *Climate Dynamics*, 44(11), 3449–3468. <https://doi.org/10.1007/s00382-014-2165-x>
9. Liu, W., Lu, J., Leung, L. R., Xie, S. P., Liu, Z., & **Zhu, J.** (2015). The de-correlation of westerly winds and westerly-wind stress over the Southern Ocean during the Last Glacial Maximum. *Climate Dynamics*, 45(11–12), 3157–3168. <https://doi.org/10.1007/s00382-015-2530-4>
8. **Zhu, J.**, Liu, Z., Zhang, X., Eisenman, I., & Liu, W. (2014). Linear weakening of the AMOC in response to receding glacial ice sheets in CCSM3. *Geophysical Research Letters*, 41(17), 6252–6258. <https://doi.org/10.1002/2014GL060891>
7. Liu, Z., **Zhu, J.**, Rosenthal, Y., Zhang, X., Otto-Bliesner, B. L., Timmermann, A., . . . Timm, O. E. (2014). The Holocene temperature conundrum. *Proceedings of the National Academy of Sciences*, 111(34), E3501–E3505. <https://doi.org/10.1073/pnas.1407229111>. (*news release*)
6. Nace, T. E., Baker, P. A., Dwyer, G. S., Silva, C. G., Rigsby, C. A., Burns, S. J., . . . **Zhu, J.** (2014). The role of North Brazil Current transport in the paleoclimate of the Brazilian Nordeste margin and paleoceanography of the western tropical Atlantic during the late Quaternary. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 415, 3–13. <https://doi.org/10.1016/j.palaeo.2014.05.030>
5. Huang, B., **Zhu, J.**, & Yang, H. (2014). Mechanisms of Atlantic Meridional Overturning Circulation (AMOC) variability in a coupled ocean-atmosphere GCM. *Advances in Atmospheric Sciences*, 31(2), 241–251. <https://doi.org/10.1007/s00376-013-3021-3>
4. Liu, Z., Carlson, a. E., He, F., Brady, E. C., Otto-Bliesner, B. L., Briegleb, B. P., . . . **Zhu, J.** (2012). Younger Dryas cooling and the Greenland climate response to CO₂. *Proceedings of the National Academy of Sciences*, 109(28), 11101–11104. <https://doi.org/10.1073/pnas.1202183109>. (*news release*)
3. **Zhu, J.**, & Yang, H. (2012). Response of the Atlantic Thermohaline Circulation to Changes of Atmospheric Green House Gases. *Acta Scientiarum Naturalium Universitatis Pekinensis*, 48(2), 231–238. (*in Chinese with English abstract*)
2. Yang, H., & **Zhu, J.** (2011). Equilibrium thermal response timescale of global oceans. *Geophysical Research Letters*, 38(14), L14711. <https://doi.org/10.1029/2011GL048076>
1. Qian, W., **Zhu, J.**, Wang, Y., & Fu, J. (2009). Regional relationship between the Jiang-Huai Meiyu and the equatorial surface-subsurface temperature anomalies. *Chinese Science Bulletin*, 54(1), 113–119. <https://doi.org/10.1007/s11434-008-0410-6>

SELECTED PRESENTATIONS

- Zhu, J.**, C. Poulsen, J. Tierney, and B. Otto-Bliesner, “Constraining equilibrium climate sensitivity through simulation of Eocene extreme warmth”. AGU Fall Meeting. Dec. 2019. San Francisco, USA. (*INVITED*)
- Zhu, J.** and C. Poulsen, “On the temperature dependence of equilibrium climate sensitivity and cloud feedback”. AGU Fall Meeting. Dec. 2019. San Francisco, USA. (*POSTER*)
- Zhu, J.**, C. Poulsen, J. Tierney, and P. DiNezio, “Investigating the Holocene ENSO variability

through isotope-enabled modeling and model-data comparisons". Water Isotopes and Climate Workshop. October 2019. Boulder, USA. (*ORAL*)

Zhu, J. and C. Poulsen, "Modeling water isotopes during the PETM and the implications for global temperature and hydrological changes". Terrestrial and Coastal Climates of the Paleocene Eocene Thermal Maximum. September 2019. Santa Cruz, USA. (*ORAL*)

Zhu, J. and C. Poulsen, "Constraining future warming from past climates". Aspen Global Change Institute workshop on 'The Future of Past Climate'. May 2019. Aspen, USA. (*ORAL*)

Zhu, J., C. Poulsen, and J. Tierney, "Simulation of Eocene extreme warmth and high climate sensitivity through cloud feedbacks". CESM Paleoclimate Working Group Meeting. February 2019. Boulder, USA. (*ORAL*)

Zhu, J., C. Poulsen, and J. Tierney, "Simulating Eocene extreme warmth and high climate sensitivity through low-cloud feedbacks". AGU Fall Meeting. Dec. 2018. Washington, D.C., USA. (*ORAL*)

Zhu, J., C. Poulsen, Z. Liu, E. Brady, B. Otto-Bliesner, and D. Noone, "Modeling the oxygen isotope in the early Eocene hothouse climate using an isotope-enabled Earth system model". Goldschmidt Conference. August 2018. Boston, USA. (*POSTER*)

Zhu, J., C. Poulsen, "Simulating the Eocene hothouse climate using the water isotope-enabled Community Earth System Model (CESM1.2)". DeepMIP Conference. July 2018. Bristol, UK. (*ORAL*)

Zhu, J., Z. Liu, E. Brady, B. Otto-Bliesner, S. Marcott, J. Zhang, X. Wang, J. Nusbaumer, T. Wong, A. Jahn, and D. Noone, "Investigating the direct meltwater effect in terrestrial oxygen-isotope records using an isotope-enabled Earth system model". CESM Paleoclimate Working Group Meeting. March 2018. Austin, USA. (*ORAL*)

Zhu, J., Z. Liu, E. Brady, B. Otto-Bliesner, S. Marcott, J. Zhang, X. Wang, J. Nusbaumer, T. Wong, A. Jahn, and D. Noone, "Investigating the direct meltwater effect in terrestrial oxygen-isotope records using an isotope-enabled Earth system model". AGU Fall Meeting. Dec. 2017. New Orleans, USA. (*ORAL*)

Zhu, J., Z. Liu, B. Otto-Bliesner, E. Brady, D. Noone, J. Zhang, R. Tomas, A. Jahn, J. Nusbaumer, and T. Wong. "Reduced ENSO Variability at the LGM Revealed by an Isotope-enabled Earth System Model". CESM PaleoClimate Working Group Meeting. March 2017. Boulder, USA. (*ORAL*)

Zhu, J., Z. Liu, B. Otto-Bliesner, E. Brady, D. Noone, J. Zhang, R. Tomas, A. Jahn, J. Nusbaumer, and T. Wong. "Reduced ENSO Variability at the LGM Revealed by an Isotope-enabled Earth System Model". AGU Fall Meeting. Dec. 2016. San Francisco, USA. (*ORAL*)

Zhu, J., Z. Liu, B. Otto-Bliesner, E. Brady, D. Noone, J. Zhang, R. Tomas, A. Jahn, J. Nusbaumer, and T. Wong. "Reduced ENSO Variability at the LGM Revealed by an Isotope-enabled Earth System Model". CLIVAR Open Science Conference. Sep. 2016. Qingdao, China. (*ORAL*)

Zhu, J., Z. Liu, X. Zhang, I. Eisenman, and W. Liu. "Linear Weakening of the AMOC in Response to Lowering Ice-sheet Topography in CCSM3". High-Resolution Proxies of Paleoclimate Workshop. May 2015. Madison, USA. (*POSTER*)

Zhu, J., Z. Liu, J. Zhang, and W. Liu. “AMOC response to global warming: dependence on the background climate and response timescale”. Annual CESM Workshop. Jun. 2014. Breckenridge, USA. (*POSTER*)

Zhu, J., Z. Liu, X. Zhang, I. Eisenman, and W. Liu. “Transient weakening of the AMOC to a receding glacial ice sheet in CCSM3 and its physical mechanisms”. Annual CESM Workshop. Jun. 2014. Breckenridge, USA. (*ORAL*)

HONORS/AWARDS

Student Travel Grant, 2016 AGU Fall Meeting	Dec. 2016
Graduate Student Travel Award, AOS, UW-Madison	Oct. 2016
International Travel Grant, CLIVAR Open Science Conference	Sep. 2016
Honorable Mention, AOSS Community Poster Reception, UW-Madison	Apr. 2015
Reid Bryson Graduate Scholarship, CCR, UW-Madison	Mar. 2015
Merit student, Peking University	Dec. 2009
Outstanding Freshman Scholarship, Peking University	Sep. 2004

TEACHING EXPERIENCE

Certificate in <i>Postdoctoral Short Course on College Teaching in Science and Engineering</i> , University of Michigan	Jan. 2019 – Apr. 2019
Teaching Assistant of <i>Introduction of Atmospheric Science</i> , School of Physics, Peking University	Sep. 2009 – Jan. 2010
Teaching Assistant of <i>Descriptive Physical Oceanography</i> , School of Physics, Peking University	Sep. 2008 – Jan. 2009

PROFESSIONAL SERVICES

Reviewer for: *Geophysical Research Letters, Journal of Climate, Journal of Geophysical Research–Oceans, Journal of Geophysical Research–Atmosphere, Climate Dynamics, Earth System Dynamics, Quaternary Science Reviews, Climate of the Past, Paleoceanography and Paleoclimatology, Atmosphere, Water, Sustainability*

Convener of: 2018 Goldschmidt Conference Session 08a: Understanding Past and Present Climate with Water Isotopes

PROFESSIONAL AFFILIATIONS

American Geophysical Union

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