






# Chengfei He, Ph.D.

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## Education

- 2017 – 2021  **Ph.D., The Ohio State University**, Atmospheric Sciences  
Thesis title: *Deciphering the deglacial evolution of water isotope and climate across the Northern Hemisphere*
- 2015 – 2017  **Ph.D. student, University of Wisconsin-Madison**, Atmospheric Sciences (transferred to OSU due to advisor's new appointment)
- 2013 – 2015  **M.S., Nanjing University of Information Science and Technology**, Meteorology
- 2009 – 2013  **B.S., Nanjing University of Information Science and Technology**, Meteorology




## Professional Experience

- 2024 – ····  **PostDoc.** Department of Physical Oceanography, Woods Hole Oceanographic Institution.
- 2021 – 2024  **PostDoc.** Rosenstiel School of Marine and Atmospheric Science, University of Miami.




## Teaching Experience

- 2023, 2024  Introduction to the Physics of Climate, ATM 307, University of Miami, Guest Lecturer
- 2022  Climate Change, ATM 653, University of Miami, Guest Lecturer
-  Introduction to the Physics of Climate, ATM 307, University of Miami, Guest Lecturer
- 2019  Dynamic Meteorology II, ASP 5952, The Ohio State University, Guest Lecturer
- 2017  Dynamic Meteorology I, ASP 5951, The Ohio State University, Guest Lecturer





## Academic Mentorship

- 2023 – 2024  Charlie Ogle (undergraduate@RSMAS, co-mentor), Python programming and Seasonality of AMV-related impacts
- Project Mentor  Tyler Fenske (Master@RSMAS), The relationship between AMV and AMOC in CMIP6 models; Ensemble simulation of ocean model hierarchy
-  Jaquelyn E Panaro (undergraduate@RSMAS), The response of westerly jet in the Red Sea region to the Volcanic eruption during the last millennium

## Awards and Achievements


- 2023  **Woods Hole Oceanographic Institution Postdoctoral Fellowship**, WHOI
-  **Lamont-Doherty Postdoctoral Fellowship**, Columbia University (declined)
- 2022  **Early Career Scientist Best Poster Award**, Clivar Climate Dynamics Panel Annual Workshop.
- 2021  **E. Willard & Ruby S. Miller Fellowship**, The Ohio State University.
- 2019  **E. Willard & Ruby S. Miller Fellowship**, The Ohio State University.

## Awards and Achievements (continued)



- 2015  **National Scholarship for Graduate students**, Nanjing University of Information Science and Technology.
- 2014  **Best Student Poster Award**, 31st Annual Meeting of the China Meteorological Society
- others  **Travel support for ForceSMIP Workshop**, NCAR, CO, 2023.
-  **Travel fellowship for Model Hierarchies Workshop**, Stanford, CA, 2022.

## Services and Activities

### Committee Member

-  Fresh Eyes on CMIP: Infrastructure and Technical Subgroup for CMIP7


### (Co)convener & Chair

-  AGU-2022: Advancing Speleothem Paleoclimate Research: Geochemical Toolkits, Proxy-Climate Quantification and Isotope-Enabled Climate Models
-  AGU-2023: Decadal to Centennial Climate Variability in the Atlantic: Mechanisms, Impacts, and Prediction (Primary Convener)



### Guest Editor

-  Proceedings of the National Academy of Sciences



### Reviewer

-  NSF proposal, Geophysical Research Letters, Journal of Climate, Climate Dynamics, JGR: Atmospheres, Paleoceanography and Paleoclimatology, Quaternary Science Reviews, Quaternary Research, Critical Reviews in Environmental Science and Technology, Nature Climate Change

### Judge

-  AGU-2022: Outstanding Student Presentation Awards Program
-  RSMAS-2023: Research Poster Contest







### Mentor

-  AGU-mentoring365 Program
-  Climatematch Academy: Computational Tools for Climate Science

### Open Source Software

-  Founder and Developer for xMCA, XCESM

## Media Releases

- 2023  Human emissions drive changes in North Atlantic Ocean temperatures, West African rainfall, hurricanes. 
- 2022  Earth's Warming Hole Not Indication of Abrupt Climate Change Event, Study Finds. 
- 2019  Climate change reshaping how heat moves around globe—Shifts in ocean, atmosphere heat transfer important to watch, researchers say. 

## Open-source Scientific Projects

### xMCA

61 Stars and 23 Forks

- xMCA is a python package developed to conduct Maximum Covariance Analysis in temporal and spatial data analysis;
- Leveraging the technique of PCA, xMCA enables users to reduce the dimension of high-dimension climate data and detect covariability in different fields.

### XCESM

18 Stars and 6 Forks

- XCESM is a python package to diagnose climate variability in CESM

### GCMAverager

- GCMAverager is a lightweight python package designed to post-process massive outputs from general circulation model(GCM) using parallel computing. It is able to extract time-series variables in parallel and calculate seasonal, annual, and decadal averages in the data.

## CMSD

- CMSD, Climate Model Simulation Dashboard, is a python package that is developed to monitor a long-lasting iTRACE simulation that produces 1PB (1000 TB) data on Cheyenne;
- Leveraging the **GCMAverager**, CMSD extracts variables from the simulation in parallel;
- The extracted variables are post-processed by *xarray*, and eventually visualized in an interactive dashboard constructed by *Plotly*.

### Radiocarbon Cycle

- A prototype of the radiocarbon cycle is developed in the CESM-CAM5, coupling the corresponding modules in the ocean and land models.
- Some preliminary results could be found here: [🔗](#)

## Publications

### Published

- 1 Cadd, H., Williams, A. N., Saktura, W. M., Cohen, T. J., Mooney, S. D., **He, C.**, ... Turney, C. S. (2024). Last glacial maximum cooling induced positive moisture balance and maintained stable human populations in australia. *Communications Earth & Environment*, 5(1), 52.
- 2 Liu, Z., Gu, S., Zou, S., Zhang, S., Yu, Y., & **He, C.** (2024). Wind-steered eastern pathway of the atlantic meridional overturning circulation. *Nature Geoscience*, 17(4), 353–360.
- 3 Parish, M., Russell, J., Konecky, B., Du, X., **He, C.**, Bijaksana, S., & Vogel, H. (2024). Changes in indo-pacific warm pool hydroclimate and vegetation during the last deglaciation. *Quaternary Science Reviews*, 336, 108755.
- 4 Snoll, B., Ivanovic, R., Gregoire, L., Sherriff-Tadano, S., Menviel, L., Obase, T., ... He, F. et al. (2024). A multi-model assessment of the early last deglaciation (pmip4 ldv1): A meltwater perspective. *Climate of the Past*, 20(4), 789–815.
- 5 Bao, Y., Liu, Z., & **He, C.** (2023a). Dipole response of millennial variability in tropical south american precipitation and  $\delta^{18}O_p$  during the last deglaciation: Part i: Rainfall response. *Journal of Climate*, 36(14), 4691–4707.

- 6 Bao, Y., Liu, Z., & He, C. (2023b). Dipole response of millennial variability in tropical south american precipitation and  $\delta^{18}O_p$  during the last deglaciation. part ii:  $\delta^{18}O_p$  response. *Journal of Climate*, 36(14), 4709–4721.
- 7 He, C., Clement, A. C., Kramer, S. M., Cane, M. A., Klavans, J. M., Fenske, T. M., & Murphy, L. N. (2023). Tropical atlantic multidecadal variability is dominated by external forcing. *Nature*, 622(7983), 521–527.
- 8 Liu, Z., He, C., Yan, M., Buizert, C., Otto-Bliesner, B., Lu, F., & Zeng, C. (2023). Reconstruction of past antarctic temperature using present seasonal  $\delta^{18}O$ -inversion layer temperature: Unified slope equations and applications. *Journal of Climate*, 1–53.
- 9 Buckingham, F., Carolin, S., Partin, J., Adkins, J., Cobb, K., Day, C., ... He, C. et al. (2022). Termination 1 millennial-scale rainfall events over the sunda shelf. *Geophysical Research Letters*, e2021GL096937.
- 10 He, C., Clement, A. C., Cane, M. A., Murphy, L. N., Klavans, J. M., & Fenske, T. M. (2022). A north atlantic warming hole without ocean circulation. *Geophysical Research Letters*, e2022GL100420.
- 11 Wen, Q., Liu, Z., Zhu, J., Yan, M., He, C., Han, J., ... Liang, Y. (2022). Local insolation drives afro-asian monsoon at orbital-scale in holocene. *Geophysical Research Letters*, 49(6), e2021GL097661.
- 12 Zhu, C., Zhang, J., Liu, Z., Otto-Bliesner, B. L., He, C., Brady, E. C., ... Zhu, C. et al. (2022). Antarctic warming during heinrich stadial 1 in a transient isotope-enabled deglacial simulation. *Journal of Climate*, 35(22), 3753–3765.
- 13 Buizert, C., Fudge, T., Roberts, W. H., Steig, E. J., Sherriff-Tadano, S., Ritz, C., ... He, C. et al. (2021). Antarctic surface temperature and elevation during the last glacial maximum. *Science*, 372(6546), 1097–1101.
- 14 Du, X., Russell, J. M., Liu, Z., Otto-Bliesner, B. L., Gao, Y., Zhu, C., ... He, C. (2021). Deglacial trends in indo-pacific warm pool hydroclimate in an isotope-enabled earth system model and implications for isotope-based paleoclimate reconstructions. *Quaternary Science Reviews*, 270, 107188.
- 15 He, C., Liu, Z., Otto-Bliesner, B. L., Brady, E. C., Zhu, C., Tomas, R., ... Severinghaus, J. P. (2021). Abrupt heinrich stadial 1 cooling missing in greenland oxygen isotopes. *Science Advances*, 7(25), eabh1007.
- 16 He, C., Liu, Z., Otto-Bliesner, B. L., Brady, E. C., Zhu, C., Tomas, R., ... Jin, Y. (2021). Deglacial variability of south china hydroclimate heavily contributed by autumn rainfall. *Nature communications*, 12(1), 1–9.
- 17 He, C., Liu, Z., Otto-Bliesner, B., Brady, E., Zhu, C., Tomas, R., ... Gu, S. et al. (2021). Hydroclimate footprint of pan-asian monsoon water isotope during the last deglaciation. *Science Advances*, 7(4), eabe2611.
- 18 Jin, Y., Liu, Z., He, C., & Zhao, Y. (2021). On the formation mechanism of the seasonal persistence barrier. *Journal of Climate*, 34(2), 479–494.
- 19 Li, L., Liu, Z., Lynch-Stieglitz, J., He, C., Gu, S., Zhang, J., & Otto-Bliesner, B. (2021). Testing methods for reconstructing glacial antarctic circumpolar current transport in an isotope-enabled climate model. *Paleoceanography and Paleoclimatology*, 36(10), e2020PA004183.
- 20 Li, L., Liu, Z., Zhu, C., He, C., & Otto-Bliesner, B. (2021). Shallowing glacial antarctic intermediate water by changes in sea ice and hydrological cycle. *Geophysical Research Letters*, 48(16), e2021GL094317.
- 21 Tabor, C., Lofverstrom, M., Oster, J., Wortham, B., de Wet, C., Montañez, I., ... He, C. et al. (2021). A mechanistic understanding of oxygen isotopic changes in the western united states at the last glacial maximum. *Quaternary Science Reviews*, 274, 107255.
- 22 He, C., Liu, Z., Zhu, J., Zhang, J., Gu, S., Otto-Bliesner, B. L., ... Sun, J. (2020). North atlantic subsurface temperature response controlled by effective freshwater input in heinrich events. *Earth and Planetary Science Letters*, 539, 116247.

- 23 **He, C.**, Liu, Z., & Hu, A. (2019). The transient response of atmospheric and oceanic heat transports to anthropogenic warming. *Nature Climate Change*, 9(3), 222–226.
- 24 Jin, Y., Liu, Z., Lu, Z., & **He, C.** (2019). Seasonal cycle of background in the tropical pacific as a cause of enso spring persistence barrier. *Geophysical Research Letters*, 46(22), 13371–13378.
- 25 Song, B., Zhi, X., Pan, M., Hou, M., **He, C.**, & Fraedrich, K. (2019). Turbulent heat flux reconstruction in the north pacific from 1921 to 2014. *Journal of the Meteorological Society of Japan. Ser. II*.
- 26 Liu, Z., **He, C.**, & Lu, F. (2018). Local and remote responses of atmospheric and oceanic heat transports to climate forcing: Compensation versus collaboration. *Journal of Climate*, 31(16), 6445–6460.
- 27 Liu, Z., Yang, H., **He, C.**, & Zhao, Y. (2016). A theory for bjerknes compensation: The role of climate feedback. *Journal of Climate*, 29(1), 191–208.
- 28 **He, C.**, Zhi, X., You, Q., Song, B., & Fraedrich, K. (2015). Multi-model ensemble forecasts of tropical cyclones in 2010 and 2011 based on the kalman filter method. *Meteorology and Atmospheric Physics*, 127(4), 467–479.