

Curriculum Vitae

PERSONAL INFORMATION

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RESEARCH INTERESTS

• High-resolution modeling of the large-scale ocean circulation, especially the transport and transformation of water masses of the Atlantic meridional overturning circulation (AMOC) • overflow representation in ocean model • western boundary currents/jets, recirculations, mesoscale to submesoscale eddies • high-frequency motions such as internal tides.

EDUCATION

2001-2006 Ph.D. University of Miami, Miami (FL)
1998-2001 M.S. First Institute of Oceanography, Qingdao (China)
1994-1998 B.S. Ocean University of China, Qingdao (China)

WORK EXPERIENCE

2021- **Senior Research Scientist**, Florida State University, Tallahassee (FL)
2016-2021 **Associate Research Scientist**, Florida State University, Tallahassee (FL)
2012-2016 **Assistant Research Scientist**, Florida State University, Tallahassee (FL)
2009-2012 **Assistant Research Scientist**, Univ. of Southern Mississippi, Stennis Space Center (MS)
2006-2009 **Postdoc**, Univ. of Southern Mississippi, Stennis Space Center (MS)

REFEREED PUBLICATIONS

1. **Xu, X.**, E. P. Chassignet, and A. J. Wallcraft, 2023, Importance of vertical resolution in representation of low-frequency, large-scale circulation in an eddying isopycnic model, *Ocean modeling*, in preparation.
2. Chassignet, E. P., **X. Xu**, and A. Bozec, 2023, Impact of New England seamount chain on Gulf Stream pathway and variability, *J. Phys. Oceanogr.*, submitted
3. Gonçalves Neto, A., J. Palter, **X. Xu**, and P. Fratantoni, 2023, Temporal variability of the westward Labrador Current transport at the Tail of the Grand Banks *J. Geophys. Res. Oceans*, revised.
4. **Xu, X.**, E. P. Chassignet, A. J. Wallcraft, B. K. Arbic, M. C. Buijsman, and M. Solano, 2022, On the spatial variability of the sea surface height wavenumber spectra in the Atlantic Ocean, *J. Geophys. Res. Oceans*, **127**, e2022JC018769. doi: 10.1029/2022JC018769
5. Lozier, S. M., A. S. Bower, H. H. Furey, K. L. Drouin, **X. Xu**, and S. Zou, 2022, Overflow Water Pathways in the North Atlantic, *Progress in Oceanography*, **208**, doi:10.1016/j.pocean.2022.102874
6. **Xu, X.**, E. P. Chassignet, S. Dong, and M. O. Baringer, 2022, Transport structure of the South Atlantic Ocean derived from a high-resolution numerical model and observations, *Front. Mar. Sci.- Physical Oceanography*, 9:811398. doi: 10.3389/fmars.2022.811398.

7. Chassignet, E. P. and **X. Xu**, 2021, On the importance of high-resolution in large-scale ocean models, *Advances in Atmospheric Sciences*, **38**, 1621-1634, doi:10.1007/s00376-021-0385-7
8. Chassignet, E. P., **X. Xu**, and O. Zavala-Romero, 2021, Tracking marine litter with a global ocean model: Where does go? Where does it come from? *Front. Mar. Sci.- Marine Pollution*, 8:667591. doi:10.3389/fmars.2021.667591
9. Zeng, L., E. P. Chassignet, **X. Xu**, and D. Wang, 2021, Long-term variability of the South China Sea mixed layer salinity over the past six decades, *Clim. Dyn.*, doi:10.1007/s00382-021-05711-1
10. Ajayi, A., J. Le Sommer, E. P. Chassignet, J.-M. Molines, **X. Xu**, A. Albert, and W. Dewar, 2021, Diagnosing cross-scale kinetic energy exchanges from two submesoscale permitting ocean models, *Journal of Advances in Modeling Earth Systems*, doi:10.1029/2019MS001923
11. Zhao, X., C. Zhou, **X. Xu**, R. Ye, and W. Zhao, 2020, Deep circulation in the South China Sea simulated in a regional model, *Ocean Dynamics*, **70**, 1461-1473, doi:10.1007/s10236-020-01411-2
12. Chassignet, E. P., S. Yeager, B. Fox-Kemper, A. Bozec, F. Castruccio, G. Danabasoglu, W. M. Kim, N. Koldunov, Y. Li, P. Lin, H. Liu, D. Sein, D. Sidorenko, Q. Wang, and **X. Xu**, 2020, Impact of horizontal resolution on global ocean-sea-ice model simulations based on the experiment protocols of the Ocean Model Intercomparison Project phase 2 (OMIP-2), *Geoscientific Model Development*, **13**, 4595-4637, doi:10.5194/gmd-2019-374-RC2
13. Roberts, M. J., L. C. Jackson, C. D. Roberts, V. Meccia, D. Docquier, T. Koenigk, P. Ortega, E. Moreno-Chamarro, A. Bellucci, A. Coward, S. Drijfhout, E. Exarchou, O. Gutjahr, H. Hewitt, D. Iovino, K. Lohmann, R. Schiemann, J. Seddon, L. Terray, **X. Xu**, Q. Zhang, P. Chang, S. G. Yeager, F. S. Castruccio, S. Zhang, L. Wu, 2020, Sensitivity of the Atlantic meridional overturning circulation to model resolution in CMIP6 HighResMIP simulations and implications for future changes, *Journal of Advances in Modeling Earth Systems*, doi:10.1029/2019MS002014
14. Gonçalves Neto, A., J. Palter, A. Bower, H. Furey, and **X. Xu**, 2020, Labrador Sea Water transport across the Charlie-Gibbs Fracture Zone, *J. Geophys. Res. Oceans*, doi:10.1029/2020JC016068
15. **Xu, X.**, E. P. Chassignet, Y. L. Firing, and K. Donohue, 2020, Antarctic Circumpolar Current transport through Drake Passage: What can we learn from comparing high-resolution model results to observations? *J. Geophys. Res. Oceans*, **125**, e2020JC016365. doi:10.1029/2020JC016365
16. Ajayi, A., J. Le Sommer, E. P. Chassignet, J.-M. Molines, **X. Xu**, A. Albert, and E. Cosme, 2020, Spatial and temporal variability of North Atlantic eddy field at scale less than 100 km, *J. Geophys. Res. Oceans*, **125**, doi:10.1029/2019JC015827
17. Hirschi, J. J.-M., B. Barnier, C. Böning, A. Biastoch, A. T. Blaker, A. Coward, S. Danilov, S. Drijfhout, K. Getzlaff, S. M. Griffies, H. Hasumi, H. Hewitt, D. Iovino, T. Kawasaki, A. E. Kiss, N. Koldunov, A. Marzocchi, J. V. Mecking, B. Moat, J.-M. Molines, P. G. Myers, T. Penduff, M. Roberts, A.-M. Treguier, D. V. Sein, D. Sidorenko, J. Small, P. Spence, L. Thompson, W. Weijer, and **X. Xu**, 2020, The Atlantic meridional overturning circulation in high-resolution models, *J. Geophys. Res. Oceans*, **125**(4), e2019JC015522, doi:10.1029/2019JC015522
18. Zou, S., A. Bower, H. Furey, M. S. Lozier, and **X. Xu**, 2020, Redrawing the Iceland-Scotland overflow water pathways in the North Atlantic, *Nature Communication*, **11**(1):1890, doi:10.1038/s41467-020-15513-4
19. Zou S., M. S. Lozier, and **X. Xu**, 2020, Latitudinal structure of the meridional overturning circulation variability in the North Atlantic Ocean, *J. Clim.*, **33**, 3845-3862, doi:10.1175/JCLI-D-19-0215.1
20. Maloney, E., A. Gettelman, Y. Ming, J. D. Neelin, D. Barrie, A. Mariotti, C.-C. Chen, D. R. B. Coleman, Y.-H. Kuo, B. Singh, H. Annamalai, A. Berg, J. F. Booth, S. J. Camargo, A. Dai, A. Gonzalez, J. Hafner, X. Jiang, X. Jing, D. Kim, A. Kumar, Y. Moon, C. M. Naud, A. H. Sobel, K. Suzuki, F. Wang, J. Wang, A. Wing, **X. Xu**, and M. Zhao, 2019, Process-oriented evaluation of climate and weather forecasting models, *Bull. Am. Meteorol. Soc.*, doi:10.1175/BAMS-D-18-0042.1

21. LaCasce, J. H., J. Escartin, E. P. Chassignet, and **X. Xu**, 2019, Jet instability over smooth and corrugated slopes, *J. Phys. Oceanogr.*, doi:10.1175/JPO-D-18-0129.1
22. **Xu, X.**, E. P. Chassignet, and F. Wang, 2019, On the variability of the Atlantic meridional overturning circulation transports in coupled CMIP5 simulations, *Clim. Dyn.*, doi:10.1007/s00382-018-4529-0
23. **Xu, X.**, A. Bower, H. Furey, and E. P. Chassignet, 2018, Variability of the Iceland-Scotland overflow water transport through the Charlie-Gibbs Fracture Zone: results from an eddy simulation and observations, *J. Geophys. Res. Oceans*, **123**, 5808-5823, doi:10.1029/2018JC013895
24. Zeng, L., E. P. Chassignet, R. W. Schmitt, **X. Xu**, and D. Wang, 2018, Salinification in the South China Sea since late 2012: a reversal of the freshening since 1990s, *Geophys. Res. Lett.* **45**, 2744-2751, doi:10.1002/2017GL076574
25. **Xu, X.**, P. B. Rhines, and E. P. Chassignet, 2018, On mapping the diapycnal water mass transformation in the upper North Atlantic Ocean, *J. Phys. Oceanogr.*, **48**, 2233-2258, doi:10.1174/ JPOD-17-0223.1
26. Chassignet, E. P. and **X. Xu**, 2017, Impact of horizontal resolution ($1/12^\circ$ to $1/50^\circ$) on Gulf Stream separation, penetration, and variability, *J. Phys. Oceanogr.*, 1999-2021, doi:10.1175/ JPO-D-17-0031.1
27. Trossman, D., B. K. Arbic, D. N. Straub, J. G. Richman, E. P. Chassignet, A. J. Wallcraft, and **X. Xu**, 2017, The role of rough topography in mediating impacts of bottom drag in eddy ocean circulation models, *J. Phys. Oceanogr.*, 1941-1959, doi:10.1175/JPO-D-16-0229.1
28. **Xu, X.**, P. B. Rhines, and E. P. Chassignet, 2016, Temperature-salinity structure of the North Atlantic circulation and associated heat and freshwater transports, *J. Clim.*, doi:10.1175/JCLI-D-15-0798
29. Zhao, X., C. Zhou, W. Zhao, J. Tian, and **X. Xu**, 2016, Deepwater overflow observed by three bottom-anchored moorings in the Bashi Channel, *Deep Sea Res., Part I*, **110**, 65-74, doi:10.1016/j.dsr.2016.01.007
30. **Xu, X.**, P. B. Rhines, E. P. Chassignet, and W. J. Schmitz Jr., 2015, Spreading of the Denmark Strait overflow water in the western subpolar North Atlantic: Insights from eddy-resolving simulations with a passive tracer, *J. Phys. Oceanogr.*, **45**(12), 2913-2932, doi:10.1175/JPO-D-14-0179.1
31. **Xu, X.**, E. P. Chassignet, W. E. Johns, W. J. Schmitz Jr., and E. J. Metzger, 2014, Intraseasonal to interannual variability of the Atlantic meridional overturning circulation from eddy-resolving simulations and observations, *J. Geophys. Res. Oceans*, **119**, doi:10.1002/2014JC009994
32. **Xu, X.**, H. E. Hurlburt, W. J. Schmitz Jr., J. Fischer, R. Zantopp, and P. J. Hogan, 2013, On the currents and transports connected with the Atlantic meridional overturning circulation in the subpolar North Atlantic, *J. Geophys. Res. Oceans*, **118**, doi:10.1002/jgrc.20065
33. **Xu, X.**, W. J. Schmitz Jr., H. E. Hurlburt, and P. J. Hogan, 2012, Mean Atlantic meridional overturning circulation across 26.5°N from eddy-resolving simulations compared to observations. *J. Geophys. Res. Oceans*, **117**, C03042, doi:10.1029/2011JC007586
34. Hurlburt H. E., E. J. Metzger, J. Sprintall, S. N. Riedlinger, R. A. Arnone, T. Shinoda, and **X. Xu**, 2011, Circulation in the Philippine Archipelago simulated by $1/12^\circ$ and $1/25^\circ$ global HYCOM and EAS NCOM, *Oceanography*, **24**(1), 28-47.
35. Hurlburt H. E., E. J. Metzger, J. Richman, E. P. Chassignet, Y. Drillet, M. W. Hecht, O. L. Galloudec, J. F. Shriver, **X. Xu**, and L. Zamudio. 2011, Dynamical evaluation of ocean models using the Gulf Stream as an example, in *Operational Oceanography in the 21st Century*, A. Schiller and G. B. Brassington, eds., Springer-Verlag, New York.
36. **Xu, X.**, W. J. Schmitz Jr., H. E. Hurlburt, P. J. Hogan, and E. P. Chassignet, 2010, Transport of Nordic Seas overflow water into and within the Irminger Sea: An eddy-resolving simulation and observations. *J. Geophys. Res. Oceans*, **115**, C12048, doi:10.1029/2010JC006351
37. Metzger E. J., H. E. Hurlburt, **X. Xu**, A. L. Gordon, J. Sprintall, R. D. Susanto, and H. M. van Aken, 2010, Simulated and observed circulation in the Indonesian Seas: $1/12^\circ$ global HYCOM and the INSTANT observations. *Dyn. Atmos. Oceans*, doi: 10.1016/j.dynatmoce.2010.04.002

38. Legg S., B. Briegleb, Y. Chang, E. P. Chassignet, G. Danabasoglu, T. Ezer, A. L. Gordon, S. Griffies, R. Hallberg, L. Jackson, W. Large, T. M. Özgökmen, H. Peters, J. Price, U. Riemenschneider, W. Wu, **X. Xu** and J. Yang, 2009, Improving oceanic overflow representation in climate models: the gravity current entrainment climate process team. *Bull. Am. Meteorol. Soc.*, doi:10.1175/2008BAMS2667.1
39. Chang Y. S., T. M. Özgökmen, H. Peters and **X. Xu**, 2008, Numerical simulation of the Red Sea outflow using HYCOM and comparison with REDSOX observations. *J. Phys. Oceanogr.*, **38**(2), 337-358.
40. **Xu, X.**, E. P. Chassignet, J. F. Price, T. M. Özgökmen and H. Peters, 2007, A regional modeling study of the entraining Mediterranean outflow. *J. Geophys. Res. Oceans*, **112**, C12005, doi: 10.1029/2007JC004145
41. **Xu, X.**, Y. Chang, H. Peters, T. M. Özgökmen, and E. P. Chassignet, 2006, Parameterization of gravity current entrainment for ocean circulation models using a high-order 3D nonhydrostatic spectral element model, *Ocean Modell.*, **14**, 19-44.
42. Chang Y., **X. Xu**, T. M. Özgökmen, E. P. Chassignet, H. Peters and P. F. Fischer, 2005, Comparison of gravity current mixing parameterizations and calibration using a high-resolution 3D nonhydrostatic spectral element model. *Ocean Modell.*, **10**, 342-368.

RESEARCH PROPOSALS & PROJECTS

- NSF (OCE): *Collaborative Research: US crossroad-Connectivity of the Deep Western Boundary Current through the Subpolar-Subtropical Transition Zone*, lead by A. Bower (WHOI), PI, \$469,647 [**pending**].
- NSF (OCE): *Collaborative Research: The impact of irregular small-scale topography on large-scale circulation patterns*, lead by T. Radko (NPS), PI, \$361,707 [**pending**].
- NSF (OCE-2023210): *Collaborative Research: Eddy fluxes across the Southern Antarctic Circumpolar Current Front near Southeast Indian Ridge*, lead by K. Donohue (URI), PI, \$299,471 [**2020.10 – 2025.09**]
- NSF (OCE-2038449): *UK-US Collaborative Research: Subpolar North Atlantic Processes - Dynamics and predictability of variability in Gyre and Overturning (SNAP-DRAGON)*, lead by H. Johnson (Oxford/UK), PI, \$127,342 [**2020.08 – 2023.07**]
- ONR (N00014-20-1-2769): *Vertical Resolution in Global HYCOM*, PI, \$431,285 [**2020.06 – 2023.05**]
- NSF (OCE-1537136): *Subpolar – Subtropical Connectivity of the North Atlantic Circulation*, PI, \$451,170 [2015.09 – 2019.08]
- NOAA/CPO (NA15OAR4310088): *Collaborative Research: Evaluation and Diagnosis of the Atlantic Meridional Overturning Circulation 3D Structure in Climate Models*, lead PI, \$384,318 [2015.08 – 2019.07]
- NOAA/ESPC (NA15OAR4320064): *Collaborative Research: Variability and Coherence of the Atlantic Meridional Overturning Circulation*, lead PI, \$239,175 [2014.10 – 2018.09]

POSTDOCTORAL SUPERVISION

Wang, F. (Jun 2016-May 2018)

PROFESSIONAL MEMBERSHIP AND SERVICES

Member of American Geophysical Union

Member of NASA Surface Water and Ocean Topography (SWOT) Science Team & U.S. AMOC Science Task Team on “AMOC Mechanisms and Predictability”

Proposal reviewer for National Science Foundation (NSF); Department of Energy (DOE) Office of Science; and National Oceanic and Atmospheric Administration (NOAA) Climate Program Office (CPO).

Publication reviewer for *Atmosphere (MDPI)*, *Chinese Journal of Oceanography and Limnology*, *Climate Dynamics*, *Deep Sea Research - Part I*, *Dynamics of Atmospheres and Oceans*, *Geophysical Research Letters*, *Journal of Climate*, *Journal Geophysical Research - Oceans*, *Journal Physical Oceanography*, *Ocean Modelling*, *Ocean Science (Copernicus Publications)*, *Progress in Oceanography*, *Remote Sensing*, *Scientific Reports*, *Tellus A: Dynamic Meteorology & Oceanography*, and *Transactions on Geoscience and Remote Sensing (IEEE)*