

# BIN WANG

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## ACADEMIC WORK EXPERIENCE

2022 - Present **Postdoctoral Fellow**

Department of Oceanography, Dalhousie University, Canada

Advisor: Dr. Katja Fennel

2017 - 2017 **Research Assistant**

School of Environmental Science and Engineering, Sun Yat-Sen University, China

## EDUCATION

2017 – 2022 **Ph.D.** in Biological Oceanography, Dalhousie University, Canada

Thesis: *Biogeochemical (BGC) Argo improves understanding and quantification of the ocean's biological carbon pump*

Advisor: Dr. Katja Fennel

2014 – 2016 **MSc.** in Environmental Science, Sun Yat-Sen University, China

Thesis: *A numerical study on hypoxia in the Pearl River Estuary linking water exchange and biochemical consumptions*

Advisor: Dr. Shiyu Li

2010 – 2014 **BSc.** in Environmental Science, Sun Yat-Sen University, China

## RESEARCH EXPERTISE

My research applies ocean models and autonomous observing systems, such as Biogeochemical-Argo float array, to advance our understanding of marine ecosystems and biogeochemical cycles. Data assimilation methods are also used to improve marine ecosystem estimation and prediction by combining observations and models. Under the context of global climate change, I am especially interested in the ocean's response to (e.g., hypoxia, biological carbon pump, etc.) and capabilities to mitigate (e.g., ocean-based carbon dioxide removal technologies) the change.

## PEER-REVIEWED PUBLICATIONS

Publication Metrics (based on [Google Scholar profile](#)): 160 citations in total; *h-index*: 7; *i10-index*: 7

1. Woodstock, M.S., Kiszka, J.J., Ramírez-León, M.R., Sutton, T.T., Fennel, K., **Wang, B.** and Zhang, Y. (2023), Cetacean-mediated vertical nitrogen transport in the oceanic realm. *Limnology and Oceanography*. <https://doi.org/10.1002/lno.12433>

2. **Wang, B.** and Fennel, K. (2023): An assessment of vertical carbon flux parameterizations using backscatter data from BGC Argo. *Geophysical Research Letters*, 50 (3), e2022GL101220. [10.1029/2022GL101220](https://doi.org/10.1029/2022GL101220)
3. **Wang, B.** and Fennel, K. (2022): Biogeochemical-Argo data suggest significant contributions of small particles to the vertical carbon flux in the subpolar North Atlantic. *Limnology and Oceanography*, 67 (11): 2405-2417. [10.1002/lno.12209](https://doi.org/10.1002/lno.12209) ([OCB Highlight](#))
4. Fennel, K., Mattern, J. P., Doney, S. C., Bopp, L., Moore, A. M., **Wang, B.**, and Yu, L. (2022): Ocean biogeochemical modelling. *Nature Review Methods Primers*, 2 (76). [10.1038/s43586-022-00154-2](https://doi.org/10.1038/s43586-022-00154-2) ([OCB Highlight](#))
5. Chen, Z., **Wang, B.**, Xu, C., Zhang, Z., Li, S., and Hu, J. (2022): Interannual variabilities, long-term trends, and regulating factors of low-oxygen conditions in the coastal waters off Hong Kong. *Biogeosciences*, 19 (14): 3469–3490. [10.5194/bg-19-3469-2022](https://doi.org/10.5194/bg-19-3469-2022)
6. **Wang, B.**, Fennel, K., and Yu, L. (2021): Can assimilation of satellite observations improve subsurface biological properties in a numerical model? A case study for the Gulf of Mexico. *Ocean Science*, 17 (4): 1141–1156. [10.5194/os-17-1141-2021](https://doi.org/10.5194/os-17-1141-2021)
7. Zhang, Z., **Wang, B.**, Li, S., Huang, J., and Hu, J. (2021): On the Intra-annual Variation of Dissolved Oxygen Dynamics and Hypoxia Development in the Pearl River Estuary. *Estuaries and Coasts*, 45: 1305-1323. [10.1007/s12237-021-01022-0](https://doi.org/10.1007/s12237-021-01022-0)
8. Hu, J., Zhang, Z., **Wang, B.**, and Huang, J. (2021): Long-term spatiotemporal variations in and expansion of low-oxygen conditions in the Pearl River estuary: a study synthesizing observations during 1976–2017. *Biogeosciences*, 18 (18): 5247–5264. [10.5194/bg-18-5247-2021](https://doi.org/10.5194/bg-18-5247-2021)
9. **Wang, B.**, Fennel, K., Yu, L., and Gordon, C. (2020): Assessing the value of biogeochemical Argo profiles versus ocean color observations for biogeochemical model optimization in the Gulf of Mexico. *Biogeosciences*, 17 (15): 4059–4074. [10.5194/bg-17-4059-2020](https://doi.org/10.5194/bg-17-4059-2020)
10. Yu, L., Fennel, K., **Wang, B.**, Laurent, A., Thompson, K. R., and Shay, L. K. (2019): Evaluation of nonidentical versus identical twin approaches for observation impact assessments: an ensemble-Kalman-filter-based ocean assimilation application for the Gulf of Mexico. *Ocean Science*, 15 (6): 1801–1814. [10.5194/os-15-1801-2019](https://doi.org/10.5194/os-15-1801-2019)
11. **Wang, B.**, Hu, J., Li, S., Yu, L., and Huang, J. (2018): Impacts of anthropogenic inputs on hypoxia and oxygen dynamics in the Pearl River estuary. *Biogeosciences*, 15 (20): 6105-6125. [10.5194/bg-15-6105-2018](https://doi.org/10.5194/bg-15-6105-2018)
12. Xu, C., Xu, Y., Hu, J., Li, S., **Wang, B.** (2018): A numerical analysis of the summertime Pearl River plume from 1999 to 2010: Dispersal patterns and intraseasonal variability. *Journal of Marine Systems*, 192: 15-27. [10.1016/j.jmarsys.2018.12.010](https://doi.org/10.1016/j.jmarsys.2018.12.010)
13. Xu, Z., Li, S., Hu, J., Wang, S., **Wang, B.**, Guo, M., Geng, B. (2018): Summer Phytoplankton responses to upwelling and river plume in Northern South China Sea. *Journal of Tropical Oceanography*, 37(6): 92-103. [10.11978/2018001](https://doi.org/10.11978/2018001) (in Chinese with English abstract)
14. **Wang, B.**, Hu, J., Li, S., and Liu, D. (2017): A numerical analysis of biogeochemical controls with physical modulation on hypoxia during summer in the Pearl River estuary. *Biogeosciences*, 14 (12), 2979-2999. [10.5194/bg-14-2979-2017](https://doi.org/10.5194/bg-14-2979-2017)

## MANUSCRIPTS IN PREPARATION

1. **Wang, B.** and Fennel, K.: Organic matter transfer efficiency is the largest uncertainty for biological carbon pump in CMIP6 models, *Communications Earth & Environment* (revision)

## CONFERENCE PRESENTATION (1<sup>st</sup> AUTHOR ONLY)

- Wang, B.**, Fennel, K., *Biogeochemical (BGC) Argo data improves quantification and understanding of the ocean's biological carbon pump. **Oral presentation*** at ASLO Aquatic Sciences Meeting 2023, Palma de Mallorca, Spain, June 2023
- Wang, B.**, Laurent, A., Fennel, K., *The passive dye tracer experiments in Bedford Basin to support Ocean Alkalinity Enhancement. **Oral presentation*** at 57th Canadian Meteorological and Oceanographic Society Congress (virtual), ST. JOHN'S, Canada, May 2023
- Wang, B.**, Fennel, K., *Evaluating roles of small and large particles in the vertical carbon flux in subpolar North Atlantic from BGC-Argo floats. **Oral presentation*** at Ocean Sciences Meeting 2022 (virtual), US, February 2022
- Wang, B.**, Fennel, K., Yu, L., *Can data assimilation of physical and biological satellite observations inform subsurface distributions in the Gulf of Mexico? **Oral presentation*** at Joint ECMWF/OceanPredict workshop on Advances in Ocean Data Assimilation (virtual), UK, May 2021
- Wang, B.**, Fennel, K., Yu, L., Gordon, C., *Assessing the Value of BGC Argo Profile Observations for Ocean Biogeochemical Data Assimilation in a Model of the Gulf of Mexico. **Poster presentation*** at Ocean Sciences Meeting 2020, San Diego, US, February 2020
- Wang, B.**, Fennel, K., Yu, L., Gordon, C., *Tradeoffs between satellite surface and Argo profile observations when optimizing a biogeochemical model for the Gulf of Mexico. **Oral presentation*** at OceanPredict'19, Halifax, Canada, May 2019
- Wang, B.**, Fennel, K., Yu, L., Gordon, C., Zong, H., He, R., *A data-assimilative physical-biogeochemical model for the Gulf of Mexico. **Poster presentation*** at 52nd Canadian Meteorological and Oceanographic Society Congress, Halifax, Canada, June 2018
- Wang, B.**, Hu, J., Li, S., and Liu, D., *A numerical analysis of biogeochemical controls with physical modulation on variations of hypoxia during summer in the Pearl River Estuary. **Oral presentation*** at 14th Estuarine and Coastal Modeling Conference, Boston, US, June 2016

## INVITED PRESENTATIONS

- Speaker (invited), Mercator Ocean International (MOI), November 2023 (virtual)
- Speaker (invited), Marine Ecosystem Analysis and Prediction (MEAP-TT), October 2023 (virtual)
- Speaker (invited), Second Institute of Oceanography, MNR, Hangzhou, China, July 2023
- Speaker (invited), Hong Kong University of Science and Technology (Guangzhou), Guangzhou, China, July 2023
- Speaker (invited), Scientific Committee on Oceanic Research (SCOR) Working Group 161, Respiration in the Mesopelagic Ocean (ReMO): Reconciling ecological, biogeochemical and model estimates, August 2022 (virtual)
- Speaker (invited), State Key Laboratory of Tropical Oceanography, South China Sea Institute of Oceanography, CAS, Guangzhou, China, January 2022 (virtual)

## TEACHING EXPERIENCES

- 2022                    **Teaching Assistant**, Dalhousie University, Halifax, Canada  
Marine Modelling (OCEA 4380/5380)

## **AWARDS**

2021                    Chinese Government Award for Outstanding Self-financed Students Abroad

## **OTHER ACADEMIC ACTIVITIES**

### **Manuscript Reviewer:**

Limnology and Oceanography, Biogeosciences, Journal of Geophysical Research-Oceans, Journal of Geophysical Research-Biogeosciences, Frontiers in Marine Science

### **Proposal Reviewer:**

The French National Research Agency (ANR) proposal

### **Scientific Cruises:**

Bermuda Atlantic Time-series Study (BATS) research cruise (2019)

Several cruises in China supported by the Ocean Public Welfare Scientific Research Project (2014-2016)