



王云鹤 博士

副研究员

硕士生导师

海洋环流与波动实验室

办公电话 0532-82895975

电子邮箱 wangyunhe@qdio.ac.cn

联系地址 山东省青岛市市南区南海路 7 号, 中国科学院海洋研究所

研究方向 极地海冰变化及预报预测

ResearchGate 个人主页: <https://www.researchgate.net/profile/Yunhe-Wang-3>

个人简介

主要从事极地海冰变化与预报预测研究, 聚焦南、北极, 在海冰变率特征、驱动机制、可预测性评价、预测模型发展方面取得一系列成果。主要科学发现: 1) 首次发现了南极冬季云-大气环流-海冰系统的耦合模态, 系统阐明了 wave-3 在该耦合系统中所扮演的角色; 2) 发展了首个北极海冰厚度季节预测模型, 可超前预测 12 个月; 3) 发展了基于 Markov 模型的北极太平洋扇区海冰季节预测模型, 预测能力显著强于美国 GFDL-FLOR 数值模式; 4) 发展了基于人工智能的南极海冰季节内预测模型, 预测能力显著强于 ECMWF、NCEP、GFDL-SPEAR 等主流数值模式。在 JC、GRL、TC、ERL、JGR 等期刊发表 SCI 论文 20 篇, 其中第一/通讯作者 10 篇; 授权发明专利 4 项, 授权软件著作权 1 项; 主持国家自然科学基金等项目 5 项。ERL、Climate Dynamics 审稿人。

教育背景

2015.09 - 2020.07	中国科学院海洋研究所	环境科学	理学博士
2018.12 - 2019.12	美国哥伦比亚大学	海冰预测	访问学者
2011.12 - 2015.07	山东理工大学	勘查技术与工程	工学学士

工作经历

2023.10 - 至今	中国科学院海洋研究所	副研究员
2022.12 - 2023.10	中国科学院海洋研究所	助理研究员
2020.07 - 2022.11	中国科学院海洋研究所	博士后

论文著作

- [1] **Yunhe Wang**, Xiaojun Yuan*, Haibo Bi, Yibin Ren, Yu Liang, Cuihua Li, and Xiaofeng Li*. Understanding Arctic Sea Ice Thickness Predictability by a Markov Model. *Journal of Climate*, 2023, 36(15): 4879–4897. <https://doi.org/10.1175/JCLI-D-22-0525.1>
- [2] **Yunhe Wang**, Xiaojun Yuan*, Yibin Ren, Mitchell Bushuk, Qi Shu, Cuihua Li, Xiaofeng Li*. Subseasonal Prediction of Regional Antarctic Sea Ice by a Deep Learning Model. *Geophysical Research Letters*, 2023, 50(17), e2023GL104347. <https://doi.org/10.1029/2023GL104347>
- [3] **Yunhe Wang**, Xiaojun Yuan*, Mark A. Cane. Coupled mode of cloud, atmospheric circulation, and sea ice controlled by wave-3 pattern in Antarctic winter. *Environmental Research Letters*, 2022, 17(4): 044053. <https://doi.org/10.1088/1748-9326/ac5272>
- [4] **Yunhe Wang**, Xiaojun Yuan*, Haibo Bi, Mitchell Bushuk, Yu Liang, Cuihua Li, Haijun Huang. Reassessing seasonal sea ice predictability of the Pacific-Arctic sector using a Markov model. *The Cryosphere*, 2022, 16(3): 1141-1156. <https://doi.org/10.5194/tc-16-1141-2022>
- [5] **Yunhe Wang**, Xiaojun Yuan, Haibo Bi*, Yu Liang, Haijun Huang*, Zehua Zhang, and Yanxia Liu. The Contributions of Winter Cloud Anomalies in 2011 to the Summer Sea-Ice Rebound in 2012 in the Antarctic. *Journal of Geophysical Research: Atmospheres*, 2019, 124: 3435-3447. <https://doi.org/10.1029/2018JD029435>
- [6] **Yunhe Wang**, Haibo Bi*, and Yu Liang. A satellite-observed substantial decrease in multiyear ice area export through the Fram Strait over the last decade. *Remote Sensing*, 2022, 14:2562. <https://doi.org/10.3390/rs14112562>
- [7] **Yunhe Wang**, Haibo Bi*, Haijun Huang*, Yanxia Liu, Yilin Liu, Xi Liang, Min Fu, Zehua Zhang, Satellite-observed trends in the Arctic sea ice concentration for the period 1979-2016. *Journal of Oceanology and Limnology*, 2019, 37(1): 18–37. <https://doi.org/10.1007/s00343-019-7284-0>
- [8] BI Haibo, **WANG Yunhe***, ZHANG Wenfeng, ZHANG Zehua, LIANG Yu, ZHANG Yi, HU Wenmin, FU Min, HUANG Haijun*, Recent satellite-derived sea ice volume flux through the Fram Strait: 2011-2015. *Acta Oceanologica Sinica*, 2018, 37(9): 107–115. <https://doi.org/10.1007/s13131-018-1270-9>
- [9] BI Haibo*, Liang Yu#, **Wang Yunhe***, Liang Xi, Zhang Zehua, Du tingqin, Yu Qinglong, Huang Jue, Kong Mei; HUANG Haijun. Arctic multiyear sea ice variability observed from satellites: A review. *Journal of Oceanology and Limnology*, 2020, 38: 962–984. <https://doi.org/10.1007/s00343-021-0382-9>
- [10] Weifu Sun, Haibo Bi*, Min Fu, Xi Liang, **Yunhe Wang***, Yu Liang, Jue Huang, Haijun Huang, Liwen Yan, Qinglong Yu, Shuang Liang. Spatiotemporal characteristics of sea ice transport in the Baffin Bay and its association with atmospheric variability. *Acta Oceanologica Sinica*, 2021, 40 (3): 1-17. <https://doi.org/10.1007/s13131-021-1720-7>

- [11] Haibo Bi, **Yunhe Wang**, Yu Liang*, Weifu Sun*, Xi Liang, Qinglong Yu, Zehua Zhang, and Xiuli Xu. Influences of Summertime Arctic-Dipole Atmospheric Circulation on Sea Ice Concentration Variations in the Pacific Sector of the Arctic During Different Pacific Decadal Oscillation Phases. *Journal of Climate*, 2021, 34(8): 3003-3019. <https://doi.org/10.1175/JCLI-D-19-0843.1>
- [12] Yu Liang, Haibo Bi*, **Yunhe Wang**, Haijun Huang*, Zehua Zhang, Jue Huang, Yanxia Liu. Role of Extratropical Wintertime Cyclones in Regulating the Variations of Baffin Bay Sea Ice Export. *Journal of Geophysical Research: Atmospheres*, 2021, 125(5): e2020JD033616. <https://doi.org/10.1029/2020JD033616>
- [13] Haibo Bi*, Zehua Zhang, **Yunhe Wang**, Xiuli Xu, Yu Liang, Jue Huang, Yilin Liu, and Min Fu. (2019). Baffin Bay sea ice inflow and outflow: 1978–1979 to 2016–2017. *The Cryosphere*. 13: 1-18. <https://doi.org/10.5194/tc-13-1025-2019>
- [14] Haibo Bi*, Jinlun Zhang, **Yunhe Wang**, Zehua Zhang, Yi Zhang, Min Fu, Haijun Huang, and Xiuli Xu, Arctic Sea Ice Volume Changes in Terms of Age as Revealed From Satellite Observations. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 2018. 11(7): 2223-2237. <https://doi.org/10.1109/JSTARS.2018.2823735>
- [15] Liang Yu, Bi Haibo*,**Wang Yunhe**, Zhang Zehua,Huang Haijun*. Role of atmospheric factors in forcing Arctic sea ice variability. *Acta Oceanologica Sinica*,2020,39(9): 60-72. <https://doi.org/10.1007/s13131-020-1629-6>
- [16] FAN Xieyu, BI Haibo*, **WANG Yunhe**, FU Min, ZHOU Xuan, XU Xiuli and HUANG Haijun, Increasing winter conductive heat transfer in the Arctic sea-ice-covered areas: 1979–2014. *Journal of Ocean University of China*, 2017, 16: 1061-1071. <https://doi.org/10.1007/s11802-017-3359-8>
- [17] Haibo Bi*, Qinghua Yang, Xi Liang, Liang Zhang, **Yunhe Wang**, Yu Liang, and Haijun Huang. (2019). Contributions of advection and melting processes to the decline in sea ice in the Pacific sector of the Arctic Ocean. *The Cryosphere*. 13: 1423-1439. <https://doi.org/10.5194/tc-13-1423-2019>
- [18] Yu Liang, Haibo Bi, Haijun Huang, Ruibo Lei, Xi Liang, Bin Cheng, and **Yunhe Wang**. Contribution of warm and moist atmospheric flow to a record minimum July sea ice extent of the Arctic in 2020,*The Cryosphere*, 2022,16(3): 1107-1123. <https://doi.org/10.5194/tc-16-1107-2022>

授权专利

- [1] **王云鹤**, 毕海波, 秦克玉, 黄海军。一种面向 ArcGIS 极地矢量场可视化的角度转换方法, 专利号: ZL201710674691.7, 授权日: 2019-09-13
- [2] **王云鹤**, 毕海波, 刘一霖, 黄海军。一种面向 IDL 语言海冰密集度求算优化算法, 专利号: ZL201711282505.1, 授权日: 2019-08-02

- [3] **王云鹤**，毕海波，黄海军。一种面向 IDL 极地向量场可视化的算法，专利号：ZL201711136282.8，授权日：2021-01-12
- [4] **王云鹤**，毕海波，刘艳霞，黄海军。一种面向 IDL 投影转换算法，专利号：ZL201711136796.3，授权日：2021-02-09

软件著作

- [1] **王云鹤**，毕海波，黄海军。极地向量可视化软件 V1.0，权利取得方式：原始取得，权利范围：全部权利，登记号：2017SR535147. 授权日期：2017-09-21，国家版权局

项目课题

1. 国家自然科学基金青年项目，42106223，南极冬季中层云对海冰的强迫机制研究，2022-01，2024-12，主持
2. 山东省自然科学基金青年项目，ZR2021QD059，基于马尔科夫模型南极海冰季节预测，2022-01，2024-12，主持
3. 博士后特别资助（站前），2020TQ0322，基于马尔科夫模型北极太平洋扇区海冰季节性预报，2021-01，2022-12，主持
4. 青岛市博士后应用研究项目，基于 Markov 模型北极太平洋扇区海冰面积季节预测，2021-01，2022-12，主持
5. 中国科学院海洋地质与环境重点实验室开放基金项目，MGE2021KG15，基于线性 Markov 模型南极海冰范围季节预测，2021-10，2023-09，主持

荣誉奖励

2023	Journal of Oceanology and Limnology 优秀论文奖
2022	海洋所“优秀博士后”激励计划
2019	博士国家奖学金