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### **EDUCATION**

|                   |       |  |
|-------------------|-------|--|
| 1995/08 – 1998/11 | Ph.D. | Department of Marine, Earth, and Atmospheric Sciences, North Carolina State Univ., USA |
| 1988/09 – 1990/06 | M.S.  | Institute of Marine Geology, National Sun Yat-sen Univ., Taiwan                        |
| 1984/09 – 1988/06 | B.S.  | Department of Oceanography, National Taiwan Ocean Univ., Taiwan                        |

### **EMPLOYMENT**

|                   |   |
|-------------------|---|
| 2022/05 – present | Research Fellow, RCEC, Academia Sinica.   |
| 2020/01 – 2022/04 | Distinguished Professor, National Taiwan Normal Univ.                           |
| 2013/07 – 2015/12 | Research Chair Professor, National Taiwan Normal Univ.                          |
| 2009/08 – 2022/04 | Professor, National Taiwan Normal Univ.   |
| 2007/08 – 2008/07 | Visiting Scientist, Program in Atmospheric & Oceanic Sciences, Princeton Univ.  |
| 2005/08 – 2009/07 | Associate Professor, Depart. of Earth Sciences, National Taiwan Normal Univ.    |
| 2001/02 – 2005/07 | Assistant Professor, Depart. of Earth Sciences, National Taiwan Normal Univ.    |
| 1999/02 – 2001/01 | Postdoc Researcher, Institute of Marine Sciences, Univ. of Southern Mississippi |

### **HONORS & AWARDS**

|             |   |
|-------------|---|
| 2016        | Outstanding Faculty Service Award, National Taiwan Normal Univ.             |
| 2012 – 2014 | Outstanding Research Award, National Science Council.                       |
| 2012        | Outstanding Research Award, National Taiwan Normal Univ.                    |
| 2010 – 2015 | Research Excellence Award, College of Science, National Taiwan Normal Univ. |

### **PROFESSIONAL SERVICE**

- Editorial Board Member, *Scientific Reports* (SCI), 2018 – present
- Guest editor, *Journal of Geophysical Research: Oceans* (SCI), 2020 – present
- Guest editor, *Water* (SCI), 2021 – present
- Guest editor, *Sustainability* (SCI), 2018 – 2020
- Editor-in-Chief, *Journal of Research in Education Sciences* (Scopus), 2013 – 2018
- Guest editor, *Estuarine, Coastal and Shelf Science* (SCI), 2013 – 2015
- Associate editor, *Ocean Dynamics* (SCI), 2009 – 2010
- Associate editor, *Terrestrial, Atmospheric and Oceanic Sciences* (SCI), 2009 – 2012

## RESEARCH INTEREST

I have developed numerous models with different integration domains and resolutions to study ocean circulation over the North Pacific. These models are now routinely used, not only for process studies to uncover dynamics and mechanisms, but also (in conjunction with field/satellite data) for ocean predictions and to help analyze and explain observations. In recent years, I have made substantial further advancement in the climate impact on the ocean current and marine life. It is demonstrated that global climate change/variability plays an essential role on modulating regional ocean circulation. Several new findings and their associated mechanisms have been published recently. For example, we found out a systemwide weakened Kuroshio despite enhanced warming along its path, updating the earlier argument of an accelerating Kuroshio under the global warming. We also pointed out interannual variability in the eel catch in East Asia is strongly correlated with the combination mode (C-mode), but not with ENSO. In addition, we demonstrated that the North Atlantic warming is the ultimate forcing leading to changes in the atmospheric and oceanic circulation over the North Pacific.

## RESEARCH HIGHLIGHTS

- A. The profound influence from the North Atlantic on the Tropical Pacific has been a primary focus. We conducted observational analyses and numerical modeling experiments to show that the North Atlantic has also strongly influenced the Extratropical North Pacific. A rapid and synchronous change in the atmospheric and oceanic circulations was observed in the North Pacific during the late 1990s. The change was driven by the transbasin influence from the Atlantic. During the positive AMO phase since the 1990s, the anomalously warm North Atlantic triggers a series of zonally symmetric and asymmetric transbasin teleconnections involving the ITCZ (Intertropical Convergence Zone), Walker and Hadley circulations, and Rossby wave propagation that lead to a decrease in wind stress curls over the Pacific subtropics, resulting in an abrupt weakening in the North Pacific subtropical gyre and Kuroshio.
- B. The Japanese eels migrate long distances and spawn to the south of the salinity front in the NEC during new moon periods. It has been reported the salinity front has extended farther south, which has shifted the eel's spawning grounds to a lower latitude, resulting in smaller eel catches in 1983, 1992, and 1998. We demonstrated interannual variability in the eel catch is strongly correlated with the combination mode (C-mode), but not with ENSO. The spawning grounds accompanied by the salinity front extend farther south during the C-mode of climate variability, and eel larvae fail to join the nursery in the NEC, resulting in poor recruitment in East Asia. The C-mode is a previously neglected mode of climate variability generated by the nonlinear interaction between ENSO and the annual cycle in the western Pacific warm pool. Furthermore, we propose an appropriate SST index to project the eel catch in East Asian countries.

## REPRESENTATIVE PUBLICATIONS (\*: corresponding author)

Wu, C.-R., Y.-F. Lin, I-I Lin, and J.-Y. Yu (2023): [Unleashing the power of the sun: The increasing impact of the solar cycle on off-season super typhoons since the 1990s](#). *npj Climate and Atmospheric Science*, 6, 166, doi:[10.1038/s41612-023-00495-z](#). [SCI; IF:9.448]

Lin, Y.-F., C.-T. Terng, C.-R. Wu, and J.-Y. Yu\* (2023): [Seasonally-reversed trends in the subtropical Northwestern Pacific linked to asymmetric AMO influences](#). *Scientific Reports*, 13, 13735, doi:[10.1038/s41598-023-40979-9](#). [SCI; IF:4.6]

Chen, W.-H.\*, H. Ren\*, J. Chiang, Y.-L. Wang, R.-Y. Cai-Li, Y.-C. Chen, C.-C. Shen, F. Taylor, T. DeCarlo, C.-R. Wu, H.-S. Mii, and X. Wang (2023): [Increased tropical South Pacific western boundary current transport over the past century](#). *Nature Geoscience*, 16, 590-596, doi:[10.1038/s41561-023-01212-4](#). [SCI; IF:18.3]

Zheng, Z.-W., J.-Y. Lin, G. Gopalakrishnan, Y.-R. Chen, D.-J. Doong, C.-R. Ho, Q. Zheng, C.-R. Wu, and C.-F. Huang (2023): [Extreme cooling of 12.5 °C triggered by Typhoon Fungwong \(2008\)](#). *Ocean Modelling*, 182, 102176, doi:[10.1016/j.ocemod.2023.102176](#). [SCI; IF:3.2]

Wang, Y.-L. and C.-R. Wu\* (2022): [Rapid surface warming of the Pacific Asian marginal seas since the late 1990s](#). *Journal of Geophysical Research: Oceans*, 127(12), e2022JC018744, doi:[10.1029/2022JC018744](#). [SCI; IF:3.6]

Wang, L.-C., Y.-F. Lin, and C.-R. Wu\* (2022): [Intensified modulation of the Pacific north equatorial current bifurcation by the southern annular mode since the early 1990s](#). *Scientific Reports*, 12, 21210, doi:[10.1038/s41598-022-25661-w](#). [SCI; IF:4.6]

Lai, C.-C., C.-R. Wu, C.-Y. Chuang, J.-H. Tai, K.-Y. Lee, H.-Y. Kuo, and F.-K. Shiah\* (2021): [Phytoplankton and bacterial responses to monsoon-driven water masses mixing in the Kuroshio off the east coast of Taiwan](#). *Frontiers in Marine Science*, 8, 707807, doi:[10.3389/fmars.2021.707807](#). [SCI; IF:4.912]

Lin, Y.-F., J.-Y. Yu\*, C.-R. Wu, and F. Zheng (2021): [The footprint of the 11-year solar cycle in Northeastern Pacific SSTs and its influence on the Central Pacific El Nino](#). *Geophysical Research Letters*, 48(5), e2020GL091369, doi:[10.1029/2020GL091369](#). [SCI; IF:4.720]

Huang, P.-W., Y.-F. Lin, and C.-R. Wu\* (2021): [Impact of the southern annular mode on extreme changes in Indian rainfall during the early 1990s](#). *Scientific Reports*, 11, 2798, doi:[10.1038/s41598-021-82558-w](#). [SCI; IF:4.380]

Lui, H.-K., C.-T. A. Chen, W.-P. Hou, J.-M. Liao, W.-C. Chou, Y.-L. Wang, C.-R. Wu, J. Lee, Y.-C. Hsin, and Y.-Y. Choi (2020): [Intrusion of Kuroshio helps to diminish coastal hypoxia in the coast of northern South China Sea](#). *Frontiers in Marine Science*, 7, 788, doi:[10.3389/fmars.2020.565952](#). [SCI; IF:4.912]

Wang, Y.-L. and **C.-R. Wu\*** (2020): [Nonstationary El Niño teleconnection on the post-summer upwelling off Vietnam](#). *Scientific Reports*, 10, 13319, doi:[10.1038/s41598-020-70147-2](#). [SCI; IF:4.380]

Jiang, Y.-J., S.-Q. Zhang\*, J.-W. Tian\*, Z.-W. Zhang, J.-P. Gan, and **C.-R. Wu** (2020): An examination of circulation characteristics in the Luzon Strait and the South China Sea using high-resolution regional atmosphere-ocean coupled models. *Journal of Geophysical Research: Oceans*, 125(6), e2020JC016253, doi:[10.1029/2020JC016253](#). [SCI; IF:3.405]

**Wu, C.-R.\***, Y.-F. Lin, Y.-L. Wang, N. Keenlyside, and J.-Y. Yu (2019): [An Atlantic-driven rapid circulation change in the North Pacific Ocean during the late 1990s](#). *Scientific Reports*, 9, 14411, doi:[10.1038/s41598-019-51076-1](#). [SCI; IF:3.998]

Wang, Y.-L., Y.-C. Hsu, C.-P. Lee, and **C.-R. Wu\*** (2019): [Coupling influences of ENSO and PDO on the inter-decadal SST variability of the ACC around the western South Atlantic](#). *Sustainability*, 11(18), 4853, doi:[10.3390/su11184853](#). [SCI; IF:2.576]

Huang, T.-H., C.-T. A. Chen, J. Lee, **C.-R. Wu**, Y.-L. Wang, Y. Bai, X. He, S.-L. Wang, S. Kandasamy, J.-Y. Lou, B.-J. Tsuang, H.-W. Chen, R.-S. Tseng, and Y.-J. Yang (2019): [East China Sea increasingly gains limiting nutrient P from South China Sea](#). *Scientific Reports*, 9, 5648, doi:[10.1038/s41598-019-42020-4](#). [SCI; IF:3.998]

**Wu, C.-R.\***, L.-C. Wang, Y.-L. Wang, Y.-F. Lin, T.-L. Chiang, and Y.-C. Hsin (2019): [Coherent response of Vietnam and Sumatra-Java upwellings to cross-equatorial winds](#). *Scientific Reports*, 9, 3650, doi:[10.1038/s41598-019-40246-w](#). [SCI; IF:3.998]

**Wu, C.-R.\***, Y.-L. Wang, and S.-Y. Chao (2019): [Disassociation of the Kuroshio Current with the Pacific Decadal Oscillation since 1999](#). *Remote Sensing*, 11(3), 276, doi:[10.3390/rs11030276](#). [SCI; IF:4.509]

Wang, Y.-L., and **C.-R. Wu\*** (2019): [Enhanced warming and intensification of the Kuroshio Extension, 1999-2013](#). *Remote Sensing*, 11(1), 101, doi:[10.3390/rs11010101](#). [SCI; IF:4.509]

**Wu, C.-R.\***, Y.-F. Lin, and B. Qiu (2019): [Impact of the Atlantic Multidecadal Oscillation on the Pacific North Equatorial Current bifurcation](#). *Scientific Reports*, 9, 2162, doi:[10.1038/s41598-019-38479-w](#). [SCI; IF:3.998]

Lin, Y.-F., and **C.-R. Wu\*** (2019): [Distinct impacts of the 1997–98 and 2015–16 extreme El Niños on Japanese eel larval catch](#). *Scientific Reports*, 9, 1384, doi:[10.1038/s41598-018-37569-5](#). [SCI; IF:3.998]

Wang, Y.-L., and **C.-R. Wu\*** (2018): [Discordant multi-decadal trend in the intensity of the Kuroshio along its path during 1993-2013](#). *Scientific Reports*, 8, 14633, doi:[10.1038/s41598-018-32843-y](#). [SCI; IF:4.011]

Hsu, Y.-C., C.-P. Lee\*, Y.-L. Wang, **C.-R. Wu\***, and H.-K. Lui (2018): [Leading El-Niño SST Oscillations around the southern south American continent](#). *Sustainability*, 10(6), 1783, doi:[10.3390/su10061783](#). [SCI; IF:2.592]

- Chiang, T.-L., Y.-C. Hsin, and **C.-R. Wu\*** (2018): [Multidecadal changes of upper-ocean thermal conditions in the tropical northwest Pacific Ocean versus South China Sea during 1960-2015](#). *Journal of Climate*, 31(10), 3999-4016, doi:10.1175/JCLI-D-17-0394.1. [SCI; IF:4.805]
- Huang, T.-H., Z. Lun, **C.-R. Wu**, and C.-T. A. Chen\* (2018): [Interannual carbon and nutrient fluxes in southeastern Taiwan Strait](#). *Sustainability*, 10(2), 372, doi:10.3390/su10020372. [SCI; IF:2.592]
- Wu, C.-R.\***, Y.-L. Wang, Y.-F. Lin, and S.-Y. Chao (2017): [Intrusion of the Kuroshio into the South and East China Seas](#). *Scientific Reports*, 7, 7895, doi:10.1038/s41598-017-08206-4. [SCI; IF:4.122]
- Wang, L.-C., F.-F. Jin\*, and **C.-R. Wu** (2017): [Dynamics of simulated Atlantic upwelling annual cycle in CMIP5 models](#). *Journal of Geophysical Research: Oceans*, 122(7), 5774-5785, doi:10.1002/2017JC012781. [SCI; IF:2.711]
- Wang, L.-C., F.-F. Jin\*, **C.-R. Wu**, and H.-H. Hsu (2017): [Dynamics of upwelling annual cycle in the equatorial Atlantic ocean](#). *Geophysical Research Letters*, 44(8), 3737-3743, doi:10.1002/2017GL072588. [SCI; IF:4.339]
- Lin, Y.-F., **C.-R. Wu\***, and Y.-S. Han (2017): [A combination mode of climate variability responsible for extremely poor recruitment of the Japanese eel \(\*Anguilla japonica\*\)](#). *Scientific Reports*, 7, 44469, doi:10.1038/srep44469. [SCI; IF:4.122]
- Li, D., T.-L. Chiang, S.-J. Kao\*, Y.-C. Hsin, L.-W. Zheng, J.-Y. T. Yang, S.-C. Hsu, **C.-R. Wu**, and M. Dai (2017): [Circulation and oxygenation of the glacial South China Sea](#). *Journal of Asian Earth Sciences*, 138, 387-398, doi:10.1016/j.jseaes.2017.02.017. [SCI; IF:2.866]
- Wang, Y.-L., **C.-R. Wu\***, and S.-Y. Chao (2016): [Warming and weakening trends of the Kuroshio during 1993-2013](#). *Geophysical Research Letters*, 43(17), 9200-9207, doi:10.1002/2016GL069432. [SCI; IF:4.253]
- Liu, Y.-C., C. Hwang\*, J. Han, R. Kao, **C.-R. Wu**, and H.-C. Shih (2016): [Sediment-mass accumulation rate and variability in the East China Sea detected by GRACE](#). *Remote Sensing*, 8(9), 777, doi:10.3390/rs8090777. [SCI; IF:3.244]
- Wu, C.-R.\***, Y.-L. Wang, Y.-F. Lin, T.-L. Chiang, and C.-C. Wu (2016): [Weakening of the Kuroshio intrusion into the South China Sea under the global warming hiatus](#). *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 9(11), 5064-5070, doi:10.1109/JSTARS.2016.2574941. [SCI; IF:2.913]
- Han, Y.-S.\* , **C.-R. Wu**, and Y. Iizuka (2016): [Batch-like arrival waves of glass eels of \*Anguilla japonica\* in offshore waters of Taiwan](#). *Zoological Studies*, 55, 36, doi:10.6620/ZS.2016.55-36. [SCI; IF:1.008]
- Han, Y.-S.\* , Y.-F. Lin, **C.-R. Wu**, Y. Iizuka, T. Castillo, I. Yambot, M. Mamalangkap, and A. Yambot (2016): [Biogeographic distribution of the eel \*Anguilla luzonensis\*: dependence upon larval duration and oceanic currents](#). *Marine Ecology Progress Series*, 551, 227-238, doi:10.3354/meps11728. [SCI; IF:2.292]