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Last update: Nov 07, 2024

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

2024/01 – present	Research Fellow, RCCI, Academia Sinica.
2022/06 – 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.
2016	National Sun Yat-sen University Outstanding Alumni Award.
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

- Member, American Geophysical Union
- Member, Chinese Geoscience Union
- Committee Member, Scientific Committee on Oceanic Research (SCOR)
- ROC committee member, Scientific Committee on Problems of the Environment
- ROC committee member, The International Association for the Physical Sciences of the Oceans (IAPSO)
- ROC committee member, International Geosphere Biosphere Programme

- Guest Editor & Editorial Board Member, *Scientific Reports* (SCI), 2018 – present
- Academic Editor & Guest Editor, *Water* (SCI), 2021 – present
- Guest Editor, *Journal of Geophysical Research: Oceans* (SCI), 2020 – 2022
- 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
- Organizer, 1st International Workshop on Modeling the Ocean
- Referee of Journals:
  National Science Review; Scientific Reports; Biogeosciences; Remote Sensing; Ocean Modeling; Sustainability; Climate Dynamics; J. Climate; Progress in Oceanography; Limnology and Oceanography; Frontiers in Marine Science; JGR; GRL; JPO; DSR I & II; CSR; MWR … etc.

RESEARCH INTEREST

- Interbasin interactions have been increasingly emphasized in recent years due to their roles in shaping climate trends and the global warming hiatus in the Northern Hemisphere. My current study demonstrated that the Atlantic warming has strongly influenced the Pacific oceanic circulations, including an abrupt weakening in the North Pacific Subtropical Gyre (NPSG) and the Kuroshio. This pioneering study has drawn much attention in the field, and relevant research activities are currently underway in leading institutions. My recent research advances are in (1) transbasin teleconnections and processes, (2) ocean dynamics and modeling, (3) climate variabilities and impacts.

- Data assimilation involves combining ocean numerical models with data gathered from satellites, research vessels, coastal radars, buoys, and other sources to improve model accuracy. An optimization assessment is conducted to select the most suitable locations for power generation.

- Evaluating the optimal array formation of Kuroshio power generators, the turbulent interaction between the units and the Kuroshio Current, and the environmental impact assessment before and after the unit installation.

- Engaging experienced scientists and professional engineers to facilitate vertical integration of expertise from both internal and external sources within the institute, providing technical support to achieve the synchronous operation and power transmission of two 100 kW floating Kuroshio turbines.

RESEARCH HIGHLIGHTS

A. Developing high-resolution data assimilation ocean models to simulate the Kuroshio accurately. Integrating the numerical simulation results with in-situ data of ocean currents, submarine topography, geological, and geotechnical surveys to identify optimal power generation sites (including the seas off Chengkung and Suao). Specially focusing on the seabed characteristics of the target regions and establishing a regional seismic catalog to mitigate the risk of ocean hazards.

B. Our research reveals that the 11-year solar cycle can affect the incidence of the off-season typhoons in the NW Pacific by influencing SST through a footprint mechanism. The solar cycle generates a noticeable SST footprint in the subtropical North Pacific during winter and spring, which eventually intrudes into the tropical central Pacific and affects the atmospheric conditions, resulting in an increase in the occurrence of super typhoons during active solar periods. This mechanism has become more effective since the AMO (Atlantic Multi-decadal Oscillation) shifted to a warm phase in the 1990s, intensifying the subtropical Pacific couplings. An example of this type of off-season super typhoon during an active solar period is Typhoon Haiyan in 2013. By incorporating information about the solar cycle, we can anticipate the likelihood of super typhoon occurrences, thus improving decadal disaster preparation and planning.

C. The East Asian marginal seas gain heat from the warm pool via intrusion of the Kuroshio and play an important role in regulating regional climate. Here, we show that the sea surface temperature rise of the East Asian marginal seas, especially in areas where the Kuroshio intrudes, has far exceeded the rate of global ocean warming. We attribute this to warming of the Pacific Warm Pool since the 1990s. Intensified trade winds warmed the Pacific Warm Pool and caused the surface Kuroshio and the regions where it intrudes into marginal seas to warm rapidly in the late 1990s.

D. One of my noteworthy findings is a pioneering study in the field – the North Atlantic warming is the ultimate forcing leading to changes in the atmospheric and oceanic circulation over the North Pacific. Also, for the first time, we demonstrate that the Kuroshio weakens downstream east of Taiwan but is intensified upstream east of Luzon, attributable to changes in westward-propagating mesoscale eddies and basin winds. Soon after publishing, the researches were noticed by many leading scientists in the field. Especially, there are two citations of my work in Chapter 02, Changing State of the Climate System, of the Intergovernmental Panel on Climate Change Sixth Assessment Report (IPCC AR6) published in August 2021. IPCC AR6 highlighted my new idea that there is not an intensification of western boundary currents under global warming. This new finding reports a weakening Kuroshio during the recent global warming hiatus, contradicting the earlier argument of an accelerating Kuroshio.

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

Wang, Y.-L.*, F.-F. Jin, **C.-R. Wu***, and B. Qiu (2024): Northwestern Pacific oceanic circulation shaped by ENSO. *Scientific Reports*, 14, 11684, doi:10.1038/s41598-024-62361-z. [IF:4.6]

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. [IF:9.448]

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. [IF:21.531]

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. [IF:4.996]

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. [IF:3.938]

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. [IF:4.996]

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. [IF:4.996]

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. [IF:5.247]

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. [IF:5.576]

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. [IF:4.996]

Wu, C.-R.*, Y.-F. Lin, Y.-L. Wang, N. Keenlyside, and J.-Y. Yu (2019a): **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. [IF:4.996]

Wu, C.-R.*, Y.-L. Wang, and S.-Y. Chao (2019b): **Disassociation of the Kuroshio Current with the Pacific Decadal Oscillation since 1999.** *Remote Sensing*, 11(3), 276, doi:10.3390/rs11030276. [IF:5.349]

Wu, C.-R.*, Y.-F. Lin, and B. Qiu (2019c): **Impact of the Atlantic Multidecadal Oscillation on the Pacific North Equatorial Current bifurcation.** *Scientific Reports*, 9, 2162, doi:10.1038/s41598-019-38479-w. [IF:4.996]

Wu, C.-R.*, L.-C. Wang, Y.-L. Wang, Y.-F. Lin, T.-L. Chiang, and Y.-C. Hsin (2019d): **Coherent response of Vietnam and Sumatra-Java upwellings to cross-equatorial winds.** *Scientific Reports*, 9, 3650, doi:10.1038/s41598-019-40246-w. [IF:4.996]

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. [IF:5.349]

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. [IF:4.996]

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. [IF:3.9]

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. [IF:4.996]

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. [IF:5.38]

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. [IF:3.9]