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EDUCATION

1994/08 – 1999/06 Ph.D. Chemical Oceanography, Old Dominion University, VA, USA
1991/09 – 1993/06 M.S. Chemical Oceanography, National Taiwan University, Taipei, Taiwan

EMPLOYMENT

2024/12 - current Joint Appointment Research Fellow, RCEC, Academia Sinica, Taiwan.
2020/08 - 2023/07 Dean, College of Marine Sciences, NSUSU, Taiwan.
2017/10 - 2020/08 Vice Dean, College of Marine Sciences, NSUSU, Taiwan.
2016/08 - current Distinguished Professor, Dep. of Oceanography, NSUSU, Taiwan.
2013/08 - 2016/07 Professor, Dep. of Oceanography, NSUSU, Taiwan.
2013/04 - 2014/07 Associate Director, Taiwan Ocean Research Institute (TORI), Kaohsiung, Taiwan.
2011/08 - 2013/07 Professor, Institute of Marine Geology and Chemistry, National Sun Yat-sen University(NSUSU), Taiwan.
2010/08 - 2011/07 Professor, IMECE, NTOU, Keelung, Taiwan.
2006/02 - 2010/07 Associate Professor, Institute of Marine Environmental Chemistry and Ecology (IMECE), National Taiwan Ocean University(NTOU), Keelung, Taiwan.
2005/01 - 2006/01 Associate Res. Scientist, Dept. of Marine Science, TAMUG, TX, USA.
2002/02 - 2004/12 Assistant Res. Scientist, Dept. of Marine Science, TAMUG, TX, USA.
1999/08 - 2002/01 Postdoctoral Research Associate, Dept. of Marine Science, Texas A & M University at Galveston (TAMUG), TX, USA.

HONORS & AWARDS

2009 Academic award for excellence in research at National Taiwan Ocean University.
2014 Academic award for excellence in research at National Sun Yat-sen University.
2014 Advisor of Wei-Ru Chen obtained a student innovative research award funded by MOST.
2015 Academic award for excellence in research at National Sun Yat-sen University.
2016 Outstanding Professor, National Sun Yat-sen University.

2016 Outstanding research award, Ministry of Science and Technology (MOST).
2017 TAO, 2012-2016 Most Cited Article Award.
2017-2020 Outstanding Professor award, National Sun Yat-sen University.
2020-2023 Outstanding Professor award, National Sun Yat-sen University.

PROFESSIONAL SERVICE

- Editorial Board of Frontiers in Marine Sciences (2014~current)
- Editorial Board of Scientific Reports (2019~current)
- Topic editor of Frontiers in Marine Science (2020-current)
- Associate Editor of Frontiers in Marine Science (2022~current)
- Board of Editor in Marine Research (2020~current)
- Review Committee of the Oceanography Section of the National Science and Technology Council (2021-2023)
- Core experts of Taiwan Science and Technology Office for Net-zero Emission (2023-current)

RESEARCH INTEREST

My research interests are focused on marine carbon cycle, especially on carbon sequestration in oceans and their mechanisms affecting marine carbon sequestration causing by natural events (dust storms, typhoons, ocean acidification, global warming). Additionally, I work on biogeochemical responses of internal waves and mesoscale eddies on chlorophyll-a variation and biological carbon pump in the euphotic zone, the twilight zone and the deep ocean via seagoing observations and satellite images. Furthermore, I also work on impacts of ocean acidification on survival rate, growth rate, calcification, nutrition composition of crustaceans mainly on tiger shrimp, white shrimp, crabs and spiny lobsters. In addition, achieving carbon neutrality through oceanic blue carbon and macroalgae cultivation is one of the key research topics in my career.

RESEARCH HIGHLIGHTS

1. **Assessing CO_2 sources and sinks in and around Taiwan: Implication for achieving regional carbon neutrality by 2050**

   Taiwan has pledged to achieve net-zero carbon emissions by 2050, but the current extent of carbon sinks in Taiwan remains unclear. Subsequently, we suggest potential strategies to reduce CO_2 emissions and propose carbon dioxide removal methods (CDRs). The natural carbon sinks by forests, sediments, and oceans in and around Taiwan are approximately 21.5, 42.1, and 96.8 Mt-CO_2 y^{-1}, respectively, which is significantly less than Taiwan's CO_2 emissions (280 Mt-CO_2 y−1). Taiwan must consider decarbonization strategies like using electric vehicles, renewable energy, and hydrogen energy by formulating enabling policies. Besides more precisely assessing both terrestrial and marine carbon sinks, Taiwan should develop novel CDRs such as bioenergy with carbon capture and storage, afforestation, reforestation, biochar, seaweed cultivation, and ocean alkalinity enhancement, to reach carbon neutrality by 2050.

Reference: Hung et al., 2024.

2. Oceanic carbon sequestration in seas around Taiwan

We conducted hundreds of research cruises and deployed numerous floating sediment traps in the seas around Taiwan over a decade to understand the export of carbon flux driven by marine primary producers. Additionally, my research concluded that typhoons, storms, internal waves, and mesoscale eddies significantly affect carbon export. Within the exclusive economic zone in Taiwan (EEZ), the carbon sequestration in the East China Sea, the northern South China Sea, and the western North Pacific Ocean was 49.3±14.9, 19.9±4.5, and 26.4±7.8 Mt-CO_2 yr^{-1}, respectively. The carbon export flux increased approximately 1.7 to 3 times after typhoon periods, 2 to 3 times during extreme weather events, 3 to 5 times in mesoscale eddy areas, and 2 times after internal waves.

Reference: Hsieh et al., 2023. Hung et al., 2009. Hung et al., 2010. Hung and Gong, 2011. Shih et al., 2015.

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

1. **Hung C.-C.**, H.-H. Hsieh, W.-C. Chou, E.-C. Liu, C.H. Chow, Y. Chang, T.-M. Lee, P.H. Santschi, R.R.M.K.P. Ranatunga, H.P. Bacosa, Y.-Y. Shih* (2024) Assessing CO2 sources and sinks in and around Taiwan: Implication for achieving regional carbon neutrality by 2050. Marine Pollution Bulletin, accepted.
2. Lin, T.-Y., C.-L. Chen , Y.-Y. Shih , H.-H. Hsieh , W.-J. Huang , P. H. Santschi and **C.-C. Hung*** (2023) A Smallholders' Mariculture Device for Rearing Seafood: Environmentally Friendly and Providing Improved Quality. Sustainability 2023, 15, 862. https://doi.org/10.3390/su15010862.
3. Hsieh H.-H., Y.-Y. Shih, S.-H. Wu, H. P. Bacosa and **C.-C. Hung*** (2023) Oceanic Blue Carbon in Seas around Taiwan. Marine Research, 3(2), 19-36, DOI:10.29677/MR.202312_3(2).0002.
4. Weerakkody, W.S., K.H. Ling, H.-H. Hsieh, V.G. Abedneko, J.-F. Shyu, T.-M. Lee, Y.-Y. Shih, K. Ranatunga, P.H. Santschi, **C.-C. Hung*** (2023) Carbon capture by macroalgae Sarcodia suae using aquaculture wastewater and solar energy for cooling in subtropical regions. Science of the Total Environment, https://doi.org/10.1016/ j.scitotenv.2022.158850.
5. **Hung, C.-C.**, B. Huang, W.-C. Chou, K. Soong and F.L.L. Muller* (2022) Editorial: Biogeochemical and ecological responses to windor tide-induced disturbances over marginal seas. Frontiers in Marine Science, DOI: 10.3389/fmars.2022.1051194.
6. Chang, Y., Y.-Y. Shih, Y.-C. Tsai, Y.-H. Lu, J. T. Liu, T.-Y. Hsu, J.-H. Yang, X.- H. Wu and **C.-C. Hung** (2022) Decreasing trend of kuroshio intrusion and its effect on the chlorophyll-a concentration in the Luzon Strait, South China Sea. GIScience & Remote Sensing, 59:1, 633-647, DOI: 10.1080/15481603.2022.2051384.
7. Piyawardhana N., V. Weerathunga , H.-S. Chen , L. Guo , P.-J. Huang , R.R.M.K.P. Ranatunga , **C.-C. Hung*** (2022) Occurrence of microplastics in commercial marine dried fish in Asian countries. Journal of Hazardous Materials, DOI: https://doi.org/10.1016/j.jhazmat.2021.127093.

8. Hsieh, H.-H., V. Weerathunga , W. S. Weerakkody, W.-J. Huang , F. L. L. Muller , M. C. Benfeld & C.-C. **Hung*** (2021) The effects of low pH on the taste and amino acid composition of tiger shrimp. Scientific Reports, 11:21180, DOI: https://doi.org/10.1038/s41598-021-00612-z.
9. Weerathunga, V., W.-J. Huang, S. Dupont, H.-H. Hsieh, N. Piyawardhana, F.-L. Yuan, J.-S. Liao, C.-Y. Lai, W.-M. Chen and **C.-C. Hung*** (2021) Impacts of pH on the fitness and immune system of Pacific white shrimp. Frontiers in Marine Science, DOI: https://doi.org/10.3389/fmars.2021.748837.
10. Shih, Y.-Y., F.-K. Shiah, C.-C. Lai, W.-C. Chou, J.-H. Tai, Y.-S. Wu, C.-Y. Lai, C.-Y. Ko and **C.-C. Hung*** (2021) Comparison of primary production using in situ and satellite-derived values at the SEATS station in the South China Sea. Frontiers in Marine Science, DOI: https://doi.org/10.3389/fmars.2021.747763.
11. Hsieh, H.-H., M.-H. Chuang, Y.-Y. Shih, S.W. Weerallodige, W.-J. Huang, **C.-C. Hung***, F.L.L. Muller, R.R.M.K.P. Ranatunga and D.S. Wijethunga (2021) Eutrophication and Hypoxia in Tropical Negombo Lagoon, Sri Lanka. Frontiers in Marine Science. DOI: 10.3389/fmars.2021.678832.
12. Chow, C. H., Y.-Y. Shih, Y.-T. Chien, J. Y. Chen, N. Fan, W.-C. Wu and **C.-C. Hung*** (2021) The wind effect on biogeochemistry in eddy cores in the Northern South China Sea. Frontiers in Marine Science-Marine Ecosystem Ecology. DOI: 10.3389/fmars.2021.717576.
13. Shih, Y.-Y., **C.-C. Hung***, S.-H. Tuo, H.-J. Shao, C.-H. Chow, F.L.L. Muller and Y.-H. Cai (2020b) The impact of eddies on nutrient supply, diatom biomass and carbon export in the northern South China Sea. Frontiers in Earth Science, 8: 537332, DOI: 10.3389/feart.2020.537332.
14. Shih, Y.-Y., **C.-C. Hung***, S.-Y. Huang, F.L.L. Muller, Y.-H. Chen (2020a) Biogeochemical variability of the upper ocean response to typhoons and storms in the northern South China Sea. Frontiers in Marine Science, 7:151, DOI: 10.3389/fmars.2020.00151.
15. Shih, Y.-Y., H.-H. Lin, D. Li, H.-H. Hsieh, **C.-C. Hung***, C.-T. A. Chen (2019) Elevated carbon flux in deep waters of the South China Sea. Scientific Reports, 9:1496, DOI: 10.1038/s41598-018-37726-w.
16. Li, D., W.-C. Chou, Y.-Y. Shih, G.-Y. Chen, Y. Chang, C. H. Chow,T.-Y. Lin,and **C.-C. Hung*** (2018) Elevated particulate organic carbon export flux induced by internal waves in the oligotrophic northern South China Sea. Scientific Reports, 8:2042, DOI:10.1038/s41598-018-20184-9.
17. **Hung*, C.-C.**, Y.-F. Chen, S.-C. Hsu, K. Wang, J. F. Chen, D. J. Burdige (2016) Using rare earth elements to constrain particulate organic carbon flux in the East China Sea. Scientific Reports, 6:33880, DOI: 10.1038/srep33880.
18. **Hung*, C.-C.**, S.-C. Tsao, K.-H. Huang, J.-P. Jang, H.-K. Chang, F. C. Dobbs (2016) A highly sensitive underwater video system for use in turbid aquaculture ponds. Scientific Reports, 6:31810, DOI: 10.1038/srep31810.

19. Hung, C.-W., K.-H. Huang, Y.-Y. Shih, Y.-S. Lin, H.-H. Chen, C.-C. Wang, C.-Y. Ho, **C.-C. Hung***, D. J. Burdige (2016) Benthic fluxes of dissolved organic carbon from gas hydrate sediments in the northern South China Sea. Scientific Reports, 6:29597, DOI: 10.1038/srep29597.
20. Shih, Y.-Y., **C.-C. Hung***, G.-C. Gong, W.-C. Chung, Y.-H. Wang, I.-H. Lee, K.-S. Chen, C.-Y. Ho (2015) Enhanced Particulate Organic Carbon Export at Eddy Edges in the Oligotrophic Western North Pacific Ocean. PLoS One, 10(7): e0131538. doi:10.1371/journal.pone.0131538.