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EDUCATION

2019/03 – 2023/06	Ph.D.	Institute of Oceanography, National Sun Yat-sen University, Taiwan
2015/09 – 2016/04	M.R.	Institute of Applied Marine Science, University of Plymouth, U.K.
2010/09 – 2013/08	M.S.	Institute of Applied Marine Physics and Undersea Technology, National Sun Yat-sen University, Taiwan
2006/09 – 2010/06	B.A.	Depart. of Marine Environmental Informatics, National Taiwan Ocean University, Taiwan

EMPLOYMENT

2016/09 – 2019/02	Assistant Research Fellow, Taiwan Ocean Research Institute, Taiwan
2016/05 – 2016/08	Research Assistant, Coastal Geology Lab., Department of Oceanography, National Sun Yat-sen University.
2013/09 – 2015/08	Research Assistant, Marine Chemistry and Global Change Lab., Department of Oceanography, National Sun Yat-sen University.

HONORS & AWARDS

2022	Taiwan Geosciences Assembly (*Young Scientist Competition: 1st place)
2020	Annual Conference of Chinese Taipei Geophysical Society & Geological Society (*Poster Competition Ranking: 1st place)
2013	Ocean Sciences Conference in Taoyuan, Taiwan (*Ranking: 1st place)

RESEARCH INTEREST

I specialize in particle dynamics, river plume dynamics, and the complex interactions between physical and biogeochemical processes in marine environments. My research involves a multidisciplinary approach, including analyzing flow patterns, water properties, chlorophyll-a levels, nutrient concentrations, and stable isotopes of suspended particles. This approach lets me gain insights into particle transport processes within the S2S (source-to-sink) system.

Furthermore, I am intensely interested in long-term open-source data analysis, which complements my experience in handling data from various sources, including Hong Kong Hydraulic stations,

hydrographic observations with the Japan Meteorological Agency (JMA), and the PN-line in the East China Sea.

RESEARCH HIGHLIGHTS

1. **Tide-related variability of suspended particle characteristics off the mouth of Zhoushui River**

   The suspended particles are important as carriers of organic carbon and heavy metals in the nearshore area. Therefore, to understand how the carriers control the distribution of these carried substances, we need to understand the variation of suspended particle characteristics in priority. In July 2012, we conducted a fixed-location observation off the Zhuoshui River mouth, which has the highest sediment load on the west coast of Taiwan, to decipher the variation of suspended sediment characteristics and its relation to the hydrodynamic forcing. By using the empirical orthogonal function, called EOF, our work identifies particle-hydrodynamics responses into three factors, which are: (1) the distribution of the terrestrial substance caused by the tidal modulation; (2) the convergent effect of suspended matter at the river plume front; (3) bottom resuspension induced by the wave-current coupling. This study builds up the quantified model of the sediment transport processes inshore of Taiwan, which also suggests that the various hydrodynamic systems result in the complicated distribution of terrestrial substances.

   Reference: Lee et al., 2016.

2. **Particle dynamics on the river-dominated continental shelf in summer: The coupling between physics and biogeochemistry**

   In the Land-Sea Continuum, the particle dynamic in the source-to-sink processes is an important multidisciplinary research subject. However, in river-dominated ocean margins (RiOMars), particle dynamics are complex and challenging to understand due to various sources of suspended particles. To further understand the process-response relations between physical forcing and biogeochemical properties of suspended particles (SPs) on the northern South China Sea shelf (NSCS) in summer, two shipboard observations were conducted on the dispersal pathway of the Zhujiang River plume (ZRP) in June and July of 2016. Our work found the water properties and suspended particle characteristics were influenced tightly by wind field, tidal flow, upwelling circulation, and nonlinear internal waves. Although the study site was a shallow water environment, the measured parameters significantly decoupled at the surface and bottom. This indicates the importance of the multi-proxies in the source-to-sink research, which could avoid the misleading tracking of the particle source based on a single index such as $\delta^{13}C_{POC}$. Additionally, our findings improve the understanding of the coupling between physical forcing and suspended particle characteristics in the complicated river-dominated system, such as the northern South China Sea shelf.

   Reference: Lee et al., 2021 and Lee et al., 2023.

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

1. **Lee, J.,** Liu, J.T., Lin, Y.-S., Chen, C.-T.A., Wang, B.-S., 2023. The contrast in suspended particle dynamics at surface and near bottom on the river-dominated northern South China Sea shelf in summer: implication on physics and biogeochemistry coupling. Front. Mar. Sci. 10. https://doi.org/10.3389/fmars.2023.1156915
2. Tao, S., Liu, J.T., Wang, A., Blattmann, T.M., Yang, R.J., **Lee, J.**, Xu, J.J., Li, L., Ye, X., Yin, X., Wang, L., 2022. Deciphering organic matter distribution by source-specific biomarkers in the shallow Taiwan Strait from a source-to-sink perspective. Front. Mar. Sci. 9. https://doi.org/10.3389/fmars.2022.969461
3. Du, X., Liu, J. T., **Lee, J.**, Huang, P. S., Yang, R. J., & Jue, P. Z., 2022. Influence of sediment sources, water mass, and physical processes on the dynamics of flocs at a location between the mouth of a river and the head of a submarine canyon. Marine Geology, 445, 106736. https://doi.org/10.1016/j.margeo.2022.106736
4. **Lee, J.**[+], Yang, R.J.[+], Lin, H.-L., Chen, Y.-C., Cai-Li, R.-Y., Ren, H., Liu, J.T., 2022. Sedimentary Anthropogenic Carbon Signals From the Western Pacific Margin for the Last Century. Front. Earth Sci. 9. https://doi.org/10.3389/feart.2021.795519
5. Liu, J.T., **Lee, J.**, Yang, R.J., Du, X., Li, A., Lin, Y.-S., Su, C.-C., Tao, S., 2021. Coupling between physical processes and biogeochemistry of suspended particles over the inner shelf mud in the East China Sea. Mar. Geol. 442, 106657. https://doi.org/10.1016/j.margeo.2021.106657
6. **Lee, J.,** Liu, J.T., Lee, I.H., Fu, K.H., Yang, R.J., Gong, W., Gan, J., 2021. Encountering shoaling internal waves on the dispersal pathway of the Pearl River plume in summer. Sci. Rep. 11, 1–15. https://doi.org/10.1038/s41598-020-80215-2
7. Lui, H.-K., Chen, C.-T.A., Hou, W.-P., Liau, J.-M., Chou, W.-C., Wang, Y.-L., Wu, C.-R., **Lee, J.**, Hsin, Y.-C., Choi, Y.-Y., 2020. Intrusion of Kuroshio Helps to Diminish Coastal Hypoxia in the Coast of Northern South China Sea. Front. Mar. Sci. 7, 788. https://doi.org/10.3389/fmars.2020.565952
8. Lin, Y.-S., **Lee, J.,** Lin, L.-H., Fu, K.-H., Chen, C.-T.A., Wang, Y.-H., Lee, I.-H., 2020. Biogeochemistry and dynamics of particulate organic matter in a shallow-water hydrothermal field (Kueishantao Islet, NE Taiwan). Mar. Geol. 422, 106121. https://doi.org/10.1016/j.margeo.2020.106121
9. Liu, J.T., Huang, B., Chang, Y., Du, X., Liu, X., Yang, R.J., Hsu, R.T., Lin, S., Hung, J.J., **Lee, J.**, Su, C.C., Chang, Y.P., 2019. Three-dimensional coupling between size-fractionated chlorophyll-a, POC and physical processes in the Taiwan Strait in summer. Prog. Oceanogr. 176, 102129. https://doi.org/10.1016/j.pocean.2019.102129

10. Huang, T.-H., Chen, C.-T.A., **Lee, J.**, Wu, C.-R., Wang, Y.-L., Bai, Y., He, X., Wang, S.-L., Kandasamy, S., Lou, J.-Y., Tsuang, B.-J., Chen, H.-W., Tseng, R.-S., Yang, Y.J., 2019. East China Sea increasingly gains limiting nutrient P from South China Sea. Sci. Rep. 9, 5648. https://doi.org/10.1038/s41598-019-42020-4
11. Lin, Y.-S., Lui, H.-K., **Lee, J.**, Chen, C.-T.A., Burr, G.S., Chou, W.-C., Kuo, F.-W., 2019. Fates of vent CO2 and its impact on carbonate chemistry in the shallow-water hydrothermal field offshore Kueishantao Islet, NE Taiwan. Mar. Chem. 210, 1–12. https://doi.org/10.1016/j.marchem.2019.02.002
12. Liu, J.T., Hsu, R.T., Yang, R.J., Wang, Y.P., Wu, H., Du, X., Li, A., Chien, S.C., **Lee, J.**, Yang, S., Zhu, J., Su, C.-C., Chang, Y., Huh, C.-A., 2018. A comprehensive sediment dynamics study of a major mud belt system on the inner shelf along an energetic coast. Sci. Rep. 8, 4229. https://doi.org/10.1038/s41598-018-22696-w
13. **Lee, J.,** Liu, J.T., Hung, C.C., Lin, S., Du, X., 2016. River plume induced variability of suspended particle characteristics. Mar. Geol. 380, 219–230. https://doi.org/10.1016/j.margeo.2016.04.014
14. Lui, H.-K., Chen, C.-T.A., **Lee, J.**, Wang, S.-L., Gong, G.-C., Bai, Y., He, X., 2015. Acidifying intermediate water accelerates the acidification of seawater on shelves: An example of the East China Sea. Cont. Shelf Res. 111, 223–233. https://doi.org/10.1016/j.csr.2015.08.014
15. Lui, H.-K., Chen, C.-T.A., **Lee, J.,** Bai, Y., He, X., 2014. Looming hypoxia on outer shelves caused by reduced ventilation in the open oceans: Case study of the East China Sea. Estuar. Coast. Shelf Sci. 151, 355–360. https://doi.org/10.1016/j.ecss.2014.08.010

Others (Invited Talks, Keynote speech et al.)