

RACHEL LAU YU SAN

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EDUCATION

2024 –
present

Michigan State University

Ph.D. in Geography, Environment, and Spatial Sciences

2017 – 2021

National University of Singapore

Bachelor of Environmental Studies (Hons): Specialization in Geography

- Student Exchange Programme (SEP) in Norway, University of Oslo
- EXPLORE Young Marine Scientist Research Grant

EXPERIENCE

Aug 2021 –
Jul 2024

Research Assistant | National Institute of Education, Singapore

- Gathered and interpreted extensive bathymetry data to assess the impact of riverbed sand mining on the environment and communities in Southeast Asia
- Participated in overseas fieldwork involving biophysical data collection and social surveys to gain insights into livelihood changes generated by human activities
- Collaborated with team members to develop and submit three successful grant proposals to secure research funding
- Wrote, designed, and reviewed materials for presentation and publication to ensure effective communication and clarity
- Managed administrative duties related to PI's research grants (budget virement, reporting, and compliance with funding agency requirements), and procurement of equipment and supplies
- Worked collaboratively with external stakeholders and support officers to ensure smooth project management

Oct 2020 –
Dec 2020

Intern | Keppel Land

- Conducted extensive literature reviews on climate change, sea level rise, ecological coastal protection, and environmental impacts of floating developments on both global and local scales.
- Developed comprehensive reports that provided insights and recommendations for future sustainable development plans in Singapore, contributing to Keppel Land's commitment to sustainability and social responsibility.

Jun 2019 –
Aug 2019

Intern | National Parks Board Marine & Coastal Division

- Produced a comprehensive coastal biodiversity identification guide, organized a photo database, and verified photos from surveys for the Intertidal Watch Survey, contributing to the attainment of baseline information of biodiversity on the intertidal shores of Singapore.
- Aided various experts in conducting field surveys, such as the Mangrove Insect Survey, Harlequin Butterfly Survey, and Heron Watch Survey, demonstrating strong teamwork and collaboration skills.
- Supported various events hosted by NParks, including the Festival of Biodiversity, 5th Mangrove, Macrobenthos, and Management conference, and Marine Debris Stakeholder Engagement, through booth management, ushering, and note taking.

PUBLICATIONS

1. **Lau, R. Y. S.**, Park, E., Koh, Y. Q., Tran, D. D., Kantoush, S. A., Van Binh, D., & Loc, H. H. (2024). Recurrence interval of riverbed sand mining hotspots in the Mekong delta: Potential indications of unsustainable replenishment rates. *Journal of Environmental Management*, 370, 122435.
2. Tran, D. D., Thien, N. D., Yuen, K. W., **Lau, R. Y. S.**, Wang, J., & Park, E. (2023). Uncovering the lack of awareness of sand mining impacts on riverbank erosion among Mekong Delta residents: insights from a comprehensive survey. *Scientific Reports*, 13(1), 15937.
3. **Lau, R. Y. S.**, Park, E., Tran, D. D. & Wang, J. (2023). Recent intensification of riverbed mining in the Mekong Delta revealed by extensive bathymetric surveying. *Journal of Hydrology*, 130174.
4. Alcântara, E., Marengo, J. A., Mantovani, J., Londe, L. R., **Lau, R. Y. S.**, Park, E., Lin, Y. N., Wang, J., Mendes, T., Cunha, A. P., Pampuch, L., Seluchi, M., Simões, S., Cuartas, L. A., Goncalves, D., Massi, K., Alvalá, R., Moraes, O., Filho, C. S., . . . Nobre, C. (2023). Deadly disasters in southeastern South America: Flash floods and landslides of February 2022 in Petrópolis, Rio de Janeiro. *Natural Hazards and Earth System Sciences*, 23(3), 1157-1175.
5. Alemu, J. B., Yaakub, S. M., Yando, E. S., **Lau, R. Y. S.**, Lim, C. C., Puah, J. Y., & Friess, D. A. (2022). Geomorphic gradients in shallow seagrass carbon stocks. *Estuarine, Coastal and Shelf Science*, 265, 107681.

PRESENTATIONS (EXTERNAL)

1. (2025, Nov) Enhancing freshwater wetland substrate assessments through geophysical methods: Insights from ground-penetrating radar field applications. 28th Biennial Coastal and Estuarine Research Federation (CERF) Conference, Richmond, Virginia, USA. [Poster]
2. (2025, Oct) *How mud and sand shape Great Lakes coastal wetlands*. Ignite Talks MSU. https://youtu.be/_ovFOc5WwVQ?si=7nNpK7_mvBQHjj5k
3. (2025, Jun) *Linking lakebed morphology and vegetation changes in Great Lakes coastal wetlands under fluctuating water levels*. IAGLR's 68th Annual Conference on Great Lakes Research, Milwaukee, WI, USA. [Poster]
4. (2024, Mar) *Recent intensification of riverbed mining in the Mekong Delta revealed by extensive bathymetric surveying*. International Association of Geomorphologists (IAG) Geomorphology Week webinar for East and Southeast Asia, online. [Oral]
5. (2023, Dec). *Uncovering the Legacy Effects of Riverbed Sand Mining on Riverbank Instability: A Study of the Vietnamese Mekong Delta*. American Geophysical Union (AGU), San Francisco, CA, USA. [Poster]
6. (2023, Aug). *Recent Intensification of Riverbed Mining in the Mekong Delta Revealed by Extensive Bathymetric Surveying*. Asia Oceania Geosciences Society (AOGS), Singapore. [Oral]

PRESENTATIONS (INTERNAL)

1. (2026, Mar) Eco-geomorphology of Great Lakes Coastal Wetlands. *MSU Geography Quidders Talk*.
2. (2025, Nov) Enhancing freshwater wetland substrate assessments through geophysical methods: Insights from ground-penetrating radar field applications. *MSU Geography Poster Symposium*. [Poster]
3. (2024, Dec) UAV Based Detection of Broccoli Heads and Yield Prediction Under Varying Organic Nitrogen Management Strategies. *MSU Geography Poster Symposium*. [Poster]

OTHER ARTICLES

Lau, R. Y. S. & Park, E. (2023). *Riverbed sand mining threatens the future stability of the Vietnamese mekong delta*. Global Water Forum. <https://www.globalwaterforum.org/2023/11/22/riverbed-sand-mining-threatens-the-future-stability-of-the-vietnamese-mekong-delta/>

MEDIA ATTENTION

Climate connections podcast on ‘sand debt’ in the Vietnamese Mekong delta, later featured in NTU news, and on LINKEDIN, <https://www.moneyfm893.sg/guest/rachel-lau-assistant-professor-edwardpark-ntu/>

OUTREACH

(2025, MAR 1ST) Girls Math and Science Day table presenter “*Our Changing Coastline*” organized by the Graduate Women in Science. MSU STEM BUILDING.

TEACHING

(2025, Oct) Invited guest lecture for undergraduate class Geo 325: Geographic Information Systems

SKILLS

- Bilingual in Chinese
- Proficient in GIS software (ArcGIS, QGIS) for data analysis and mapping
- Proficient in Microsoft Office
- Familiarity with R statistical software