

Mapping Mangrove Biomass Using UAV- Based Optical and LiDAR Sensors

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4:00 – 5:00 pm (UTC+8)
Rm 221, Chen Kou Bun
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Understanding mangrove above-ground biomass (AGB) is essential for evaluating their role in mitigating global warming. Traditionally, SRTM and TanDEM-X models have been used to estimate mangrove canopy height and structure at regional scales. However, recent advances in optical photogrammetry using uncrewed aerial vehicles (UAVs) have enabled high-resolution mapping of canopy height, allowing the application of allometric equations to model AGB with greater precision. UAV-based LiDAR sensors further improve these estimates by capturing detailed three-dimensional tree geometry, even within dense and heterogeneous stands. By integrating optical and LiDAR datasets, we developed a multi-sensor framework to quantify mangrove AGB across contrasting ecosystems—from tall (up to 50 m) Amazonian mangroves to dwarf (<3 m) stands in coastal Louisiana, USA. This integrative approach provides unprecedented insights into the structural variability and carbon storage capacity of mangrove forests, highlighting their crucial role as coastal carbon sinks in mitigating anthropogenic CO₂ emissions.



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Invited by Prof. Liu Kam-biu

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Prof. Marcelo Cohen earned his BSc in Geology (1995) from the Federal University of Pará (Brazil) and his PhD in Biogeochemistry (2003) from the University of Bremen (Germany). He is a Full Professor at the Faculty of Oceanography and Graduate Program in Geology and Geochemistry (UFPA-Brazil), Adjunct Professor at the Louisiana State University (LSU-USA) and serves as Editor for *Forests* and *Frontiers*. He coordinated the Graduate Program at UFPA (2014–2017), served on the CNPq Oceanography Committee (2019–2022), and INQUA SACCUM (2021–today). His research focuses on Holocene and Anthropocene mangrove dynamics, using remote sensing, pollen, isotopes, and sediments to reconstruct coastal environmental changes.

