

Vegetation biogeography is a main source of uncertainty in modelling the land carbon cycle

12th February 2026 (Thu)
4:30 – 6:00 pm (UTC+8)
Rm 221, Chen Kou Bun
Building, CUHK

The terrestrial biosphere exchanges a large amount of CO₂ with the atmosphere through photosynthesis and respiration, determining the magnitude of land carbon sink and consequently influencing the rate of global warming. However, current models show large discrepancies in estimating global photosynthesis and respiration, constituting a key and persistent source of uncertainty in carbon cycle and climate modelling. In our study, we argue that this uncertainty is largely attributable to biogeography – the distribution of plant functional types (PFTs). By analysing an ensemble of dynamic global vegetation models (DGVMs), we find a strong dependence of total photosynthesis on total area for each PFT. Correcting PFT distributions with remote sensing data can reduce the spread of carbon cycle estimates by ~75%. Our study highlights the importance of accurately mapping vegetation distribution for understanding the global carbon cycle and future climate change.



Dr. Ruiying Zhao

Research Fellow

Department of Geography, National University of Singapore

Dr. Ruiying Zhao is a research fellow at the National University of Singapore (NUS). Before joining NUS, Dr. Zhao obtained her Ph.D. from Zhejiang University and her B.S. from Wuhan University. Her research focuses on the land carbon cycles, primarily using terrestrial ecosystem modelling and vegetation remote sensing to understand carbon dynamics under climate and land-use changes.



For future seminars, scan QR Code or visit:
<https://www.grm.cuhk.edu.hk/en/news/seminars/>

