



The University of Hong Kong
School of Biological Sciences

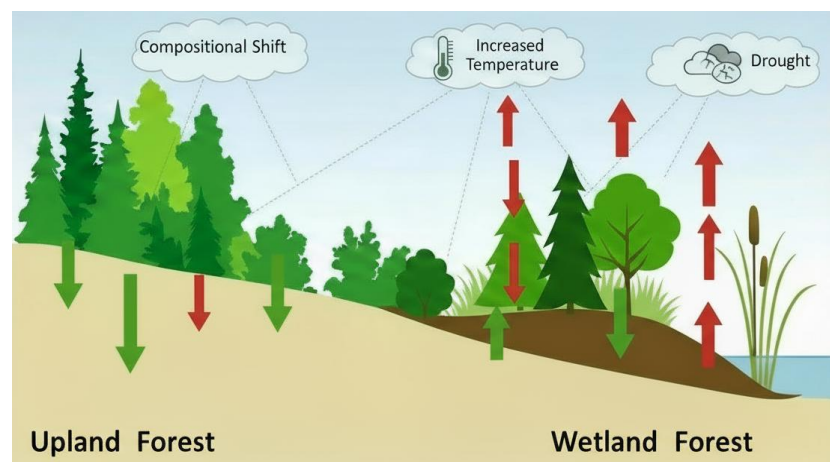
**Public
Seminar**

The role of Temperate Forest Composition Heterogeneity on Ecosystem Carbon Dynamics Under Climate Change

Date: 27 November 2025

Time: 1500 (HKT)

Venue: Room 6N-11



About the speaker:

Ziyu LIN is a PhD student supervised by Prof. Jin Wu. Her research focuses on understanding how ecosystem heterogeneity influences carbon dynamics under climate change at Wisconsin upland-wetland mixed forest ecosystem.



Abstract:

Understanding how ecosystem heterogeneity influences carbon dynamics under climate change remains a vital challenge in earth system modeling. While temperate forests serve as essential carbon sinks, their complex compositional heterogeneity hampers precise estimates of their ongoing carbon sequestration capacity. Thus, in LIN's thesis she developed a comprehensive, multi-layered approach to explore these complexities, advancing our knowledge of forest composition changes and how different species adapt over decadal periods. First, she generated 30year 30m resolution daily spectral datasets and annual forest composition change maps that capture both spatial and temporal variability over time. Then, a forest composition-based carbon mixture analysis (CMA) is proposed, enabling the separation of mixed spectral and carbon signals to reveal contrasting species responses under changing climatic conditions. Additionally, she evaluated species-specific physiological acclimation to temperature, water availability, solar radiation, and CO₂ concentration, demonstrating that these responses are highly dependent on specific traits and significant acclimations occur over decadal timescales. Overall, these findings highlight the necessity of incorporating detailed compositional and physiological heterogeneity into ecosystem models, moving beyond traditional ecosystem big leaf assumption. The knowledge gained enhances our ability to predict forest resilience and carbon fluxes in a warming world, supporting the development of more precise and adaptive management practices.