

Novel approaches for monitoring tropical peatland condition: case studies from Selangor, Malaysia

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Time	16:00 (UTC+8)
Venue	3N01 + Zoom



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80% of tropical peatland in Indonesia and Malaysia is drained for production of palm oil and pulpwood. Associated increases in peat decomposition and large-scale forest fires have led to widespread subsidence and deterioration of peat condition. However, quantification of subsidence and peat condition from these processes across SE Asia is challenging due to the scale and inaccessibility of dense tropical peat swamp forests.

Automated field methods and space-based platforms offer the opportunity for regular, pan-regional monitoring and overcome such an inaccessibility issue. In particular, a development in satellite interferometric synthetic aperture radar (InSAR) for monitoring surface motion has already been demonstrated successfully in arctic and temperate peatland environments. The novel 'APSiS-InSAR' modelling technique provides excellent coverage across almost all land surfaces irrespective of above-ground biomass cover, enabling long-term measurement of peatland surface motion across whole catchments, regions and countries. Importantly, the APSiS technique is able to determine surface deformation under tropical forest canopy using C-band InSAR, enabling continuous monitoring of surface motion ranging from 0.1–40 cm yr⁻¹ at spatial scales ≥ 20 m.

This seminar will present results from Martha's work on the performance of these novel techniques for monitoring and modelling tropical peat condition, including the APSiS-InSAR technique and peat surface motion cameras. Using peat surface oscillation patterns as a proxy for peat condition, these methods were tested on their ability to accurately monitor and characterise seasonal tropical peat surface oscillations over time.



Martha Ledger is a postdoctoral fellow within the Global Change and Tropical Conservation Lab, monitoring change in forest stand characteristics in Hong Kong. With this data, she intends to explore how these changes have impacted butterfly species distribution in Hong Kong over time. More broadly, she is interested in the application of remote sensing, EO, big data and machine learning to answer questions surrounding environmental, ecological and social issues.

Martha was previously a PhD student with the University of Nottingham, UK, using InSAR to monitor tropical peatland subsidence patterns. Since then, has worked on other projects using a variety of EO techniques to model permafrost degradation and subsidence, as well as develop a global forced labour risk model. She is always looking for innovative ways to apply EO towards solving global problems!