

Special Seminar

February 15 (Thu), 16:00-17:00

ALRC Multipurpose Hall
(Onsite only)



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Large variation in carbon dioxide emissions from tropical peat swamp forests due to disturbances

The huge carbon stock of tropical peat swamp forest (PSF) in Southeast Asia has been threatened by environmental disturbances due to quasi-periodic El Niño-Southern Oscillation (ENSO) droughts, biomass and peat burning, smoke haze, drainage, and deforestation. Carbon dioxide (CO₂) emissions from such disturbances have not been well quantified because of insufficient field data. Therefore, we quantify the ecosystem-scale CO₂ balance and examine the disturbance effects from a long-term field experiment for 12–15 years at three PSF sites with different degrees of degradation in Indonesia. Here, we show a drastic change of an undrained PSF from a CO₂ sink to a source owing to the transient groundwater lowering by the droughts, a significant decrease in ecosystem photosynthesis due to the radiation attenuation by smoke haze in drought years, and long-lasting CO₂ emissions through enhanced peat decomposition by drainage. The impact on CO₂ emissions was greater from drainage than drought-induced disturbances.

For more information:

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