

# 第241回物質循環談話会 2025年3月18日(火)15:00-16:30

対面 (13番講義室)+オンライン形式

## SPEAKER: Dr. Siti Nurhidayu

(Faculty of Forestry and Environment, Universiti Putra Malaysia/上級講師)



## TOPIC

Tropical Forest Hydrology: A Key Strategy for Leading Water Security Against Climate Change Through Upstream Conservation and Adaptive Management

Climate change poses significant challenges to global water security, particularly through altered precipitation patterns, increased frequency and intensity of extreme weather events, and depletion of water resources. These impacts exacerbate issues such as flooding, drought, and water quality degradation, which threaten both ecosystems and human societies. Forest hydrology plays a critical role in mitigating these challenges by regulating the water cycle, maintaining water quality, and stabilizing water yields. Tropical forests influence hydrological processes by enhancing water infiltration, reducing surface runoff, and supporting baseflows, making them indispensable for sustaining water resources.



Photo: Ayer Hitam Forest Reserve, Malaysia ①

### <March-18<sup>th</sup> 2025, 3:00 pm - 4:30 pm> 会場 (対面): 13 番講義室 Online: Zoom (右の QR コードから入れます) https://shinshu-u-acjp.zoom.us/j/91565891507?pwd=a5jZRgsyKrq3TBa9ktwp1aarzhPqao.1 ミーティング ID: 915 6589 1507 パスコード: 389129



This presentation explores how upstream forest conservation and adaptive management can serve as critical strategies to address the growing water security challenges posed by climate change. Protecting forested catchments helps to preserve hydrological functions, ensuring consistent water supply and reducing the risks of sedimentation and pollution. Restoration of degraded ecosystems through reforestation and afforestation enhances the ability of forests to buffer hydrological extremes, while adaptive management strategies enable dynamic responses to climatic uncertainties. The discussion includes case studies demonstrating successful forest hydrology practices, such as reduced impact logging in Danum Valley, reforestation in Cameron Highlands, and logged watershed management project in Ulu Muda. These examples underscore the benefits of integrating forest conservation into water management frameworks. However, challenges such as competing land-use priorities, funding limitations, and inadequate technical capacity need to be addressed through stronger policies, financial incentives, and stakeholder engagement. By prioritizing upstream conservation and adopting adaptive management approaches, forest hydrology offers a sustainable pathway for enhancing water security against the backdrop of climate change.



Photo: Ayer Hitam Forest Reserve, Malaysia ②

#### Keywords:

climate resilience; tropical forest hydrology; upstream forest conservation; water security; water quality management

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◆ 主催:信州大学 理学部理学科 物質循環学コース

◆ 共催:信州大学 先鋭領域融合研究群 山岳科学研究拠点