Séminaire / Seminar **AMAP**

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11h00 – 12h00

Salle 44, Bâtiment PS1, CIRAD-UMR AMAP
Visioconférence : **Lien TEAMS**

Amazon forest resilience beyond carbon stocks: a trait-based modeling approach

presented by

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ABSTRACT

The Amazon rainforest has shown signs of declining resilience, often linked to drought events and assessed primarily through carbon stocks. However, vegetation models that rely on simplified plant diversity, such as a few plant functional types (PFTs), and focus on carbon stocks alone may underestimate climate change impacts. This study explores reduced precipitation effects on the Amazon using the trait-based CAETÊ model, which incorporates functional trait variability. Comparing a PFT-based approach (three PFTs) with a trait-based approach (3,000 plant life strategies), we found that including trait variability improves accuracy in predicting net primary productivity (NPP) and carbon storage while revealing subtler responses, such as shifts in functional diversity facets and rare trait combinations. Simulating a 30% reduction in precipitation at low (every eight years) and high (every other year) frequencies showed that frequent droughts lead to ecosystem collapse, while less frequent droughts reduce resilience and alter ecosystem composition. Indicators like NPP, evapotranspiration, and diversity of surviving strategies showed early resilience loss, preceding carbon stock changes. This research highlights the critical role of plant diversity and diverse indicators in assessing resilience, suggesting greater vulnerability of tropical forests to climate impacts than previously assumed.

KEY WORDS

Tropical forests, resilience, diversity, trait-based modelling

Invited and animated by:	Isabelle Maréchaux (AMAP)
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