Special Issue

Assessing Ecosystem Respiration in Global Carbon Cycle: Digital Application in Agriculture

Message from the Guest Editors

Ecosystem respiration (Reco), a critical flux of carbon from terrestrial ecosystems to the atmosphere, plays a key role in the global carbon cycle. Although agricultural landscapes are major contributors to carbon exchange, quantifying Reco in these systems remains challenging due to their high spatiotemporal variability. The emergence of digital technologies now offers promising avenues to overcome these limitations and enhance the accuracy of Reco estimation in agriculture. This Special Issue aims to highlight innovative research on the assessment of ecosystem respiration in agricultural systems and its implications for the global carbon cycle. We are particularly interested in the application of digital technologies, including remote sensing, data synthesis, and artificial intelligence, to advance the monitoring, modeling, and understanding of Reco in agricultural landscapes. We will emphasize research that integrates multi-source data (e.g., from flux towers, satellites, and drones), employs machine learning and AI techniques, and develops novel digital approaches for quantifying Reco and its drivers.

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