

## Process-based understanding of carbon-water relations in agricultural systems

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Agriculture is confronted with multiple challenges globally and tasked with the transfer to sustainable and resilient production systems. At the same time, transfer from basic science to practice is ineffective and slow. To achieve this, understanding process dynamics of energy and matter cycle dynamics under management and Climate Change is crucial. Over the past decade, rapid technological and scientific advancements have led to unprecedented spatio-temporal resolution of (iso-)flux observations and allowing to monitor water and matter cycling continuously, automatically and simultaneously for different treatments, capturing the systems spatio-temporal heterogeneity.

Novel automated and adaptive systems (such as the sensor platform AgroFlux established at ZALF) allow for the case-specific, simultaneous assessment of energy and matter cycle dynamics and their partitioning alongside a holistic set of complementing system variables. This integrated, flexible and automated approach paves the way for a process-based understanding of cross-scale carbon-water interactions as well as the development of participative, co-design researcher that includes various stakeholders in decision processes. We believe, that this actively supports the development of sustainable land management strategies in the face of Climate Change.

**Dept Life Science Systems  
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**Monday, 01.02.2026, 16:15–17:00**

**Zoom Meeting: <https://tum-conf.zoom-x.de/j/69079483987?pwd=eIJ6bStBbXo0RHQ4aUJjVGIqRVpLdz09>**

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