



## **Soil heterotrophic respiration responses to meteorology, soil types and cropping systems in a temperate agricultural watershed.**

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Within the context of Climate Change, a better understanding of soil organic matter dynamics is of considerable importance in agro-ecosystems, due to their large mitigation potential. This study aims at better understanding the process of soil heterotrophic respiration at the annual scale and at the watershed scale, with these temporal and spatial scales allowing an integration of the most important drivers: cropping systems and management, topography, soil types, soil organic carbon content and meteorological conditions.

Twenty-four soil CO<sub>2</sub> flux measurement sites – comprising three PVC collars each – were spread over the Naizin-Kervidy catchment (ORE AgrHys, 4.9 km<sup>2</sup>, W. France) in March 2014. These sites were selected in order to represent most of the diversity in drainage classes, soil types and cropping systems. Soil CO<sub>2</sub> flux measurements were performed about every ten to fifteen days at each site, starting from 20 March 2014, using the dynamic closed chamber system Li-COR 8100. Soil temperature and soil moisture content down to 5 cm depth were measured simultaneously.

An empirical model taking the influence of meteorological drivers (soil temperature and soil water content) on soil CO<sub>2</sub> fluxes was applied to each site and the different responses were analyzed with regard to site characteristics (topography, soil organic carbon content, soil microbial biomass, crop type, crop management,...) in order to determine the most important driving variables of soil heterotrophic respiration.

The modeling objective is then to scale the fluxes measured at all sites up to the full watershed scale.