



## Impact of drought events on plant Water Use Efficiency

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One of the research topics in the eLTER-PLUS project is to study the impact of drought events on ecosystem water-use efficiency (WUE) and resilience, and the relationships between WUE, soil structure, plant productivity and ecosystem resilience. Data from 10 well-instrumented eLTER sites across a range of climatic, geological and socio-ecological regions are being used to test resilience indicators, such as WUE, nutrient use efficiency, soil structure and function. Outputs from integrated models that consider the whole water-soil-plant system are being analysed to a) assess the impact of drought events on the WUE of ecosystems, b) determine the resilience of the ecosystems with respect to their ability to recover from impacts of single & multiple droughts, and c) understand the relationship between WUE, soil structure, plant productivity and ecosystem resilience. We also develop mitigation measures for drought adverse impacts. First, we did a time series analysis of CO<sub>2</sub> and H<sub>2</sub>O fluxes from long term Flux tower Eddy Covariance measurements and calculated the evolution of WUE in time and assessed the impact of hydrologic and meteorological droughts on WUE. Second, we conducted modeling simulations of the plant-soil-water system at selected sites and assessed the relationship between WUE and soil structure, plant productivity and ecosystem resilience using the 1D-ICZ and the CLM5.0 models. The presentation will provide an overview of the results across Europe with a specific focus on the Mediterranean sites.