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## **Challenges for extracting water from soils for ecohydrological studies**

Water in soils undergoes evaporation, uptake, mixing and percolation processes. For several decades, measurements of  $\delta^2\text{H}$  and  $\delta^{18}\text{O}$  composition of soil pore waters are an important tool for examining such processes in ecohydrological studies. A variety of in-situ and lab-based pore water extraction methods for the analysis of the stable isotopes of water now exist. While some techniques have been used for decades (e.g., cryogenic vacuum extraction) others are relatively new, such as direct vapour equilibration or the microwave extraction technique. Since different extraction methods have generated different results, the choice of sampling method is crucial for the interpretation of pore water stable isotopes in ecohydrological studies. Here, each procedure and the accompanied advantages and drawbacks are presented. Possible opportunities and limitations regarding the scale of interest and the pore space that is sampled are discussed. We suggest that users of water extraction approaches carefully choose a technique that is suitable for the specific research question, scale of interest, dominant soil type, and water content. However, current methodological efforts and developments are promising to further improve our understanding of the processes taking place within the soil-vegetation interface.