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## Using stable isotopes of water to infer wetland hydrological dynamics

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**Abstract.** This paper considers the potential of oxygen and hydrogen isotope ratios to identify spatial and temporal changes in the water source of a lowland headwater wetland situated adjacent to the River Tern in Shropshire, UK. Stable isotope composition ( $d^{18}O$ ) of end-members varied between  $-7.5$  and  $-8.0\text{‰}$  for groundwater,  $-7.3$  and  $-8.5\text{‰}$  for river-water and  $-4.5$  and  $-8.0\text{‰}$  for precipitation. Water samples were extracted from six nests each comprising three porous cup samplers at depths of 0.2 m, 0.5 m and 1.0 m between June 2000 and October 2001, and their isotope compositions determined. Groundwater appears to be the main source of water to the wetland, but stable isotope ratios enable seasonal variations in the contribution of precipitation to be determined, and indicate the extent of precipitation storage within the wetland.

**Keywords:** oxygen and hydrogen isotopes, water source, hydrodynamics, lowland wetland

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