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## The impact of preferential flow on Temperate Highland Peat Swamps on Sandstone soil hydrology

**Yusong Wang**<sup>1</sup>, Mandana Shaygan<sup>1</sup>, Neil McIntyre<sup>1</sup>, and Thomas Baumgartl<sup>2</sup>

<sup>1</sup>Centre for Water in the Minerals Industry, Sustainable Minerals Institute, The University of Queensland, Australia

(yusong.wang@uq.edu.au)

<sup>2</sup>Geotechnical and Hydrogeological Engineering Research Group, Federation University, Australia

Temperate Highland Peat Swamps on Sandstone (THPSS) are ecological communities that consist of either ephemeral or permanent swamps developed in peat overlying Triassic sandstone formations in the Sydney Basin Bioregion of eastern Australia. THPSS with distinctive vegetation play an important role in biodiversity, carbon capture and storage, and the regional hydrological cycle. Some THPSS of Sydney Basin have underlying sandstone with cracks potentially formed over the past decades by human intervention. These cracks may create preferential flow paths that may accelerate the drainage process at the bottom of the swamps and may affect the soil moisture conditions of the swamps with ecological consequences. In order to understand and predict the impact of cracks on the swamps' soil moisture and provide information to guide the management and restoration of the THPSS, 2D numerical simulations have been carried out using dual-porosity hydraulic models or explicit fast flow paths to represent the preferential flow paths. The models are calibrated and validated against historical soil moisture data and then used to evaluate the effect of cracks on soil moisture.