# Transport and Transformation Pathways of Fe Within a Partially Remediated Acid Sulphate Soil Wetland

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Acid sulphate soils (ASS) are a major environmental problem in Australia. One-quarter of ASS in Queensland are in the Great Barrier Reef catchment area, and pose a serious threat to its ecosystems.

East Trinity is a coastal ASS wetland in Cairns which, since 1976, has released over 72,000 tonnes of sulphuric acid and soluble heavy metals into the surrounding waterways [1]. Remedition via lime assissted tidal exchange (LATE) began in 2004. Gradually reinstating tidal exchange while treating the most acidic drainage water with lime has been successful and remediation has proceeded at a quicker rate than expected. As such, there has been extensive research into the geochemical processes underpinning tidal remediaton at this site [e.g. 2, 3, 4].

Due to its elevation, a small area of the site was inaccessible to tidal innundation and was instead treated with freshwater diverted from one of the onsite creeks. While not as rapid as the LATE-treated soils, this remediaiton strategy has also been successful, and presents a promising approach to remediating Australia's inland ASS. There have, however, been no geochemical studies examining the freshwater remediation process, making transferability challenging.

This study investigates the freshwater remediation processes at East Trinity. Comparison of the chemistry of the sediments and pore waters undergoing freshwater and seawater remediaiton, including mineralogical characterisation and partitioning of trace metals will aid in unravelling the different mineralogical and chemical pathways during the remediation processes.

[1] Hicks *et al* (1999) CSIRO Land and Water Technical Report. [2] Burton *et al* (2011) *Geochim. Cosmochim. Acta* **75,** 3434-3451. [3] Johnston *et al* (2011) *J. of Hydro.* **409,** 128-139. [4] Keene *et al* (2010) *Mar. Poll. Bull.* **60(4),** 620