# Exploring the biogeochemcial overprint of the Anthropocene

R. T. BUSH[1], K GRICE[2], L SULLIVAN[1], P GREENWOOD[3], Z. WANG[1] AND L BERWICK[2]

[1]Southern Cross GeoScience, Southern Cross University, Lismore, Australia
Correspondence: richard.bush@scu.edu.au
[2]WA OIGC, Curtin University, Perth, Australia
kliti.grice@curtin.edu.au
[3]University of Western Australia, Perth, Australia
paul.greenwood@uwa.edu.au

The anthropogenic impacts of human population and industrial enterprise have become recognised as "a great force of Nature"[1], contributing to change at a global scale in biodiversity, biogochemistry, sediment flux and climate. Industrialisation and the rapid rise in atmospheric carbon dioxide is one of the measures used to mark the onset of the Anthropocene[1,2]. Our interest is in the interactions of organics with mineral systems of contemporary environments and related biogeochemical processes that will be evident in the sedimentary record, distinguishing this geological period.

The fate and dynamics of Fe and S and their interaction with trace metals and organic carbon are particularly sensitive to the impact of humans[3,4]. Using as an example contemporary degraded acid sulfate coastal environments, we demonstrate a shift toward accumulation of ferrimegnetic mineral greigite and enrichment of pyrite[4], wholesale transformation of Fe-mineral assessmblages, the persistence of otherwise transient organics and iron sulfide phases, widely fluctauting pH and extreme porewater $Fe^{II}$ concentrations (i.e. > 50mM)[4,5]. Each of these conditions leave their marks on the recent sediment record of coastal sediments. The question remains as to whether such biogeochemical processes and their paelo-markers are unique to the "human impact Epoch", and how the paelo-record of mineral systems in earleir periods can help predict the geochemcial tradjectory of our changing environment.

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