A post-wildfire response in cave dripwater chemistry

Gurinder Nagra[1*], Pauline C. Treble[1, 2], Martin S. Andersen[1], Ian J. Fairchild[3], Katie Coleborn[1], Andy Baker[1]

[1] {Connected Waters Initiative Research Centre, University of New South Wales, Sydney, NSW, 2052, Australia}

[2] {Institute for Environmental Research, Australian Nuclear Science and Technological Organisation, Lucas Heights, NSW, 2234, Australia}

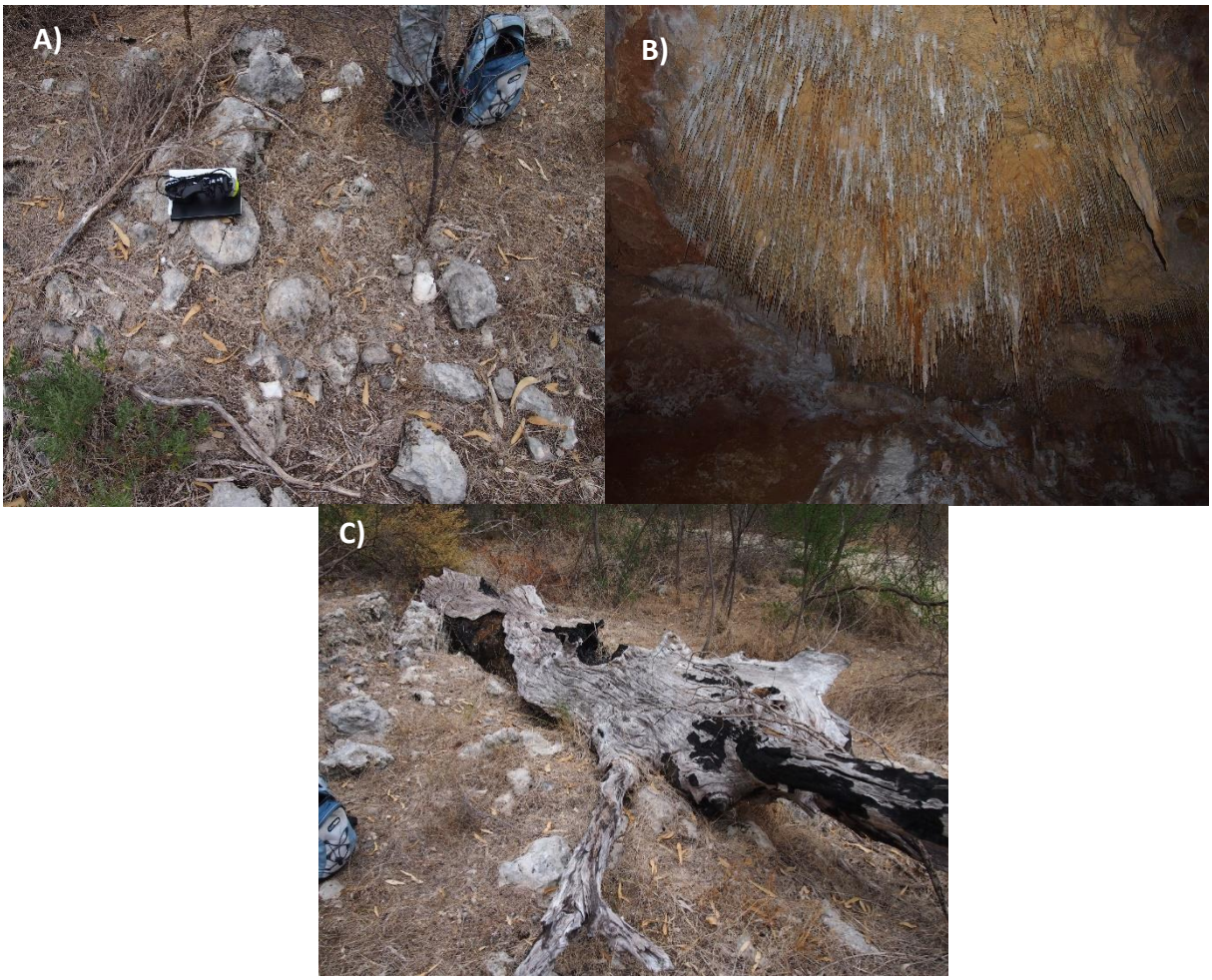
[3] {School of Geography, Earth and Environmental Sciences, University of Birmingham, Edgbaston, Birmingham, UK}

Correspondence to: G. Nagra (g.nagra@unsw.edu.au)

SUPPLEMENTARY MATERIAL

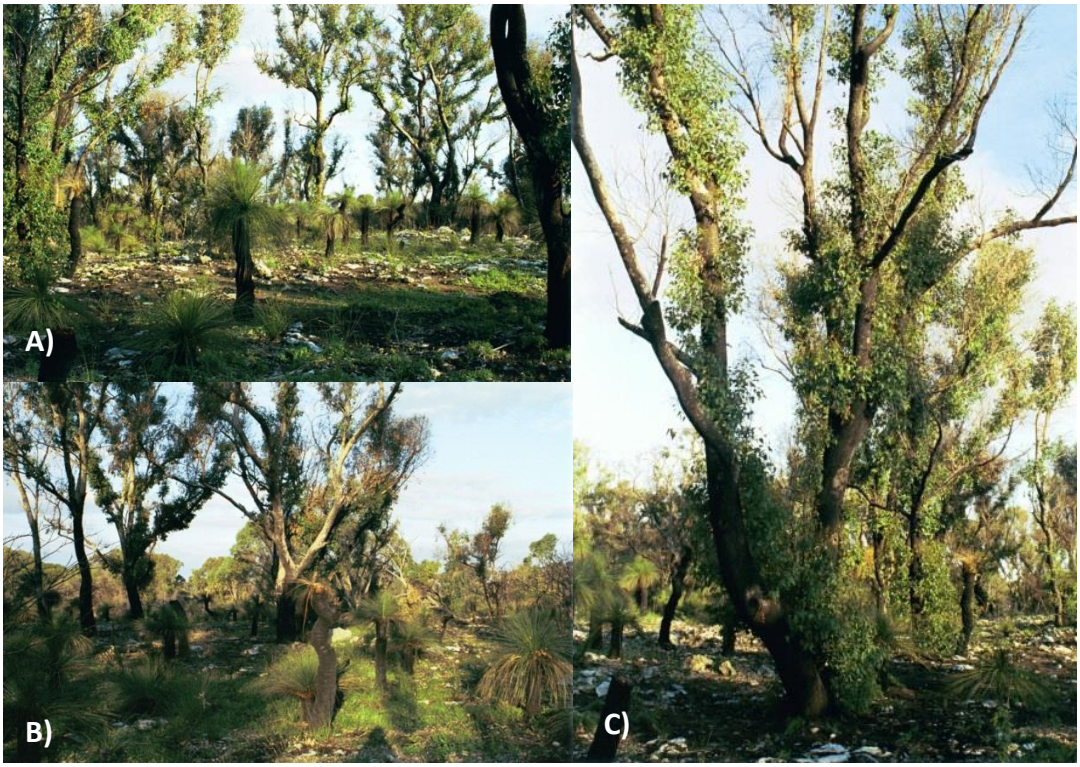
Supplementary Figure 1) The entrance to Yonderup cave, showing distinct fracturing which has occurred post-fire and indicative of a high intensity fire (photograph taken March 2015).

Supplementary Figure 2) Images of Site 1a a) soil cover above the site, showing exposed bedrock b) ‘wheat field’ of stalactites on the roof c) dead tuart tree above site 1a with exposed bedrock cover. The photograph was taken March 2015. Due to the close proximity of the tree above the site, infiltration water chemistry may have been affected by the wood ash created as this tree was burnt during the fire.

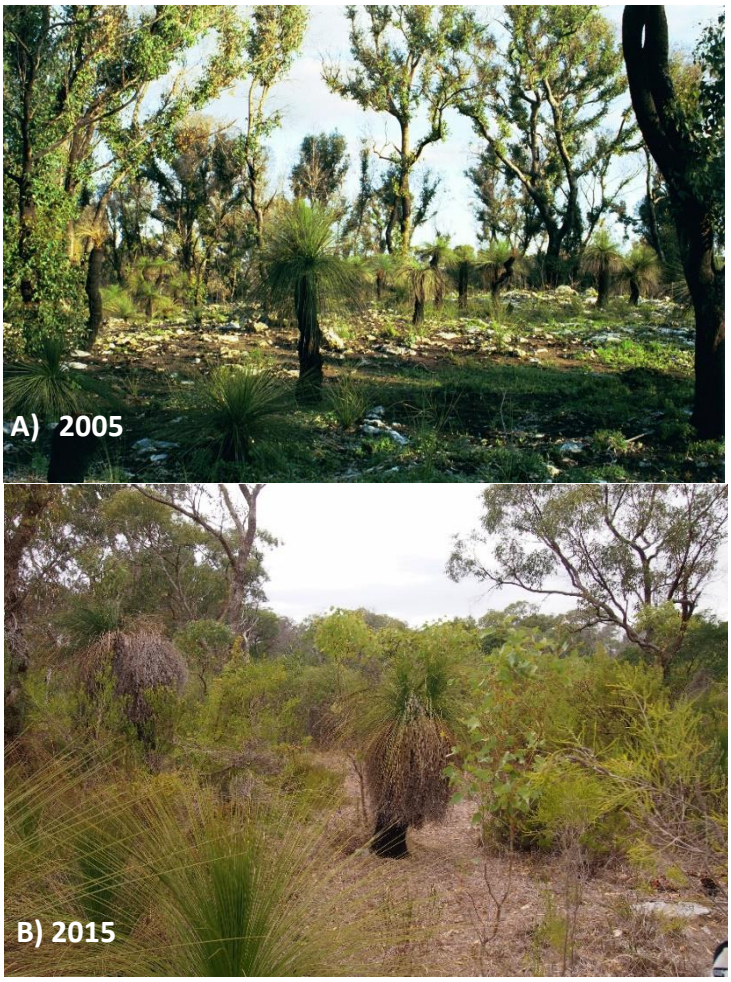


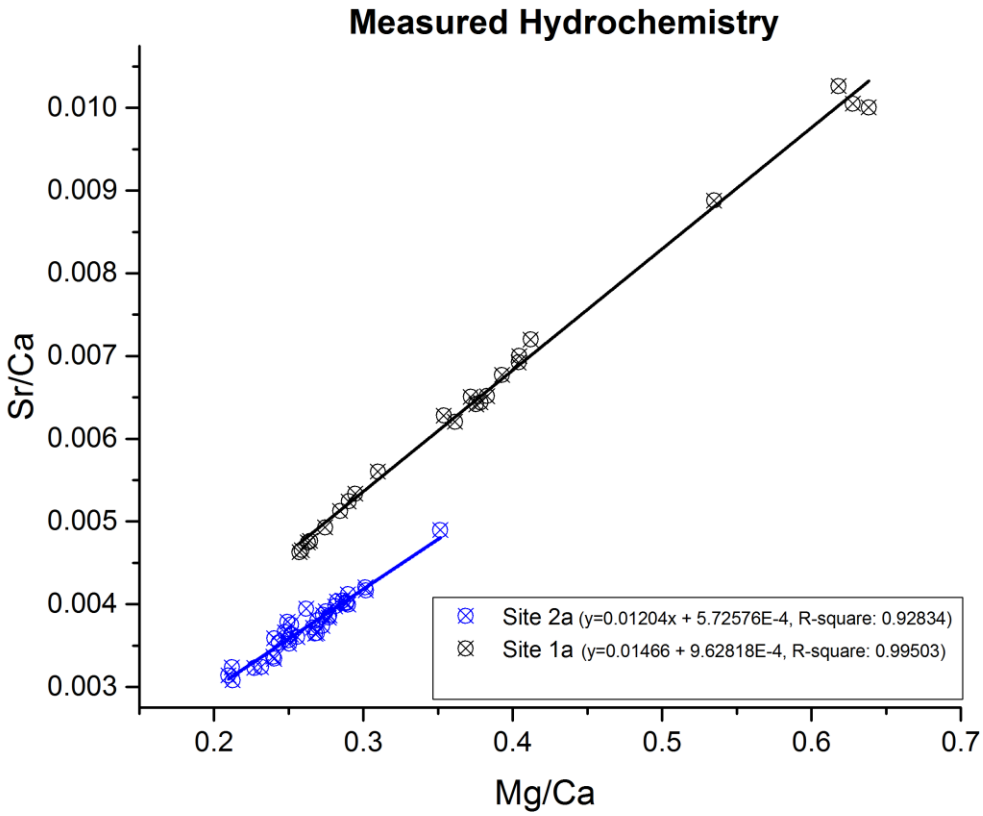
Supplementary Figure 3) Site 2a and its ‘Cathedral’ like structure with large stalactites hanging from the roof.

Supplementary Figure 4) Photos of regrowth 7 months after wildfire at Yanchep.



Supplementary Figure 5) Regrowth post-wildfire in Yanchep National Park from (A) August 2005 to (B) March 2015.





84

85 Figure 2. Relationship between Sr/Ca vs Mg/Sr for both Site 1a (black) and Site 2a (blue),
86 this indicates that both sites have independent flow paths. Further both sites fall within the
87 diagnostic model for water-rock interactions that include PCP by Sinclair (2011) and Treble
88 et al. (2015) who found PCP to be a dominating in-cave process in Golgotha Cave 300 km,
89 south of Yonderup Cave. We discuss this in further depth later in our paper.

90

91

Refer to excel file for following captions: DR_Geo_Tables

Table DR1) Shows anion and cations data in mg/L and mmol/L for Site 1a (DR1A) and Site 2a (DR1B).

Table DR2) Show isotopic data using IRMS method (A) and CRDS method (B) at both Site 1a and Site 2a.

Discharge Calculations of Site 1a and Site 2a.

Table DR3) Show soil depth from centre point above each site, every meter for five meters in directions North, South, East and West.

Water balance calculations: These include P - AET calculations and cumulative water balance (CWB).