



Supplement of

Exploring how groundwater buffers the influence of heatwaves on vegetation function during multi-year droughts

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3 Fig S1 annual precipitation anomaly (P) from 2000 to 2019 over S.E. Australia. The anomalies were calculated relative to the 1970-2019

4 climatology.



Fig S2 (a) Distribution of CABLE plant functional types over S.E. Australia and (b) the root fraction (%) above a given depth (m).



10 Fig S3 Annual evapotranspiration (E). (a)-(c) are for Millennium drought, and (d)-(f) are for the recent drought. (a) and (d) are E in GLEAM;

11 (b) and (e) are ΔE between GW and GLEAM; (c) and (f) are ΔE between FD and GLEAM.



Fig S4 Annual gross primary production (GPP). (a)-(c) are for Millennium drought, and (d)-(f) are for the recent drought. (a) and (d) are GPP in GW; (b) and (c) are GPP in FD; (c) and (f) are \triangle GPP between GW and FD.



- 21 Fig S5 The mean water table depth (m) during 2017-2019 from the GW experiment.



Fig S6. Maximum air temperature (°C) over the heatwave regions on (a) 15th and (b) 25th Jan 2019.



Fig S7. The difference of ΔT at 2pm between (a)-(b) GW and MODIS LST (ΔT_{GW_2pm} - ΔT_{MOD_2pm}), (c)-(d) FD and MODIS LST (ΔT_{FD_2pm} -31 ΔT_{MOD_2pm}), and (e)-(f) DR and MODIS LST (ΔT_{DR_2pm} - ΔT_{MOD_2pm}). The left column is for 15th and the right is for 25th Jan 2019.



Fig S8. The difference of transpiration (Et) at 2pm between (a)-(b) GW and FD (Et_{GW_2pm} - Et_{FD_2pm}), and between (c)-(d) DR and GW (Et_{DR_2pm} - Et_{GW_2pm}). The left column is for 15th and the right is for 25th Jan 2019.



Fig S9. The time series of the difference in E between GW and FD (Δ E) over S.E. Australia. The lines show the mean Δ E over S.E. Australia 42 (black), shallow WTD regions (< 5m; blue); medium WTD regions (5~10m; green) and deep WTD region (>10m; orange).