Supporting Information for "Storage in south eastern Australian catchments"

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Table S1.   HBV model parameters and their ranges used in model calibration.

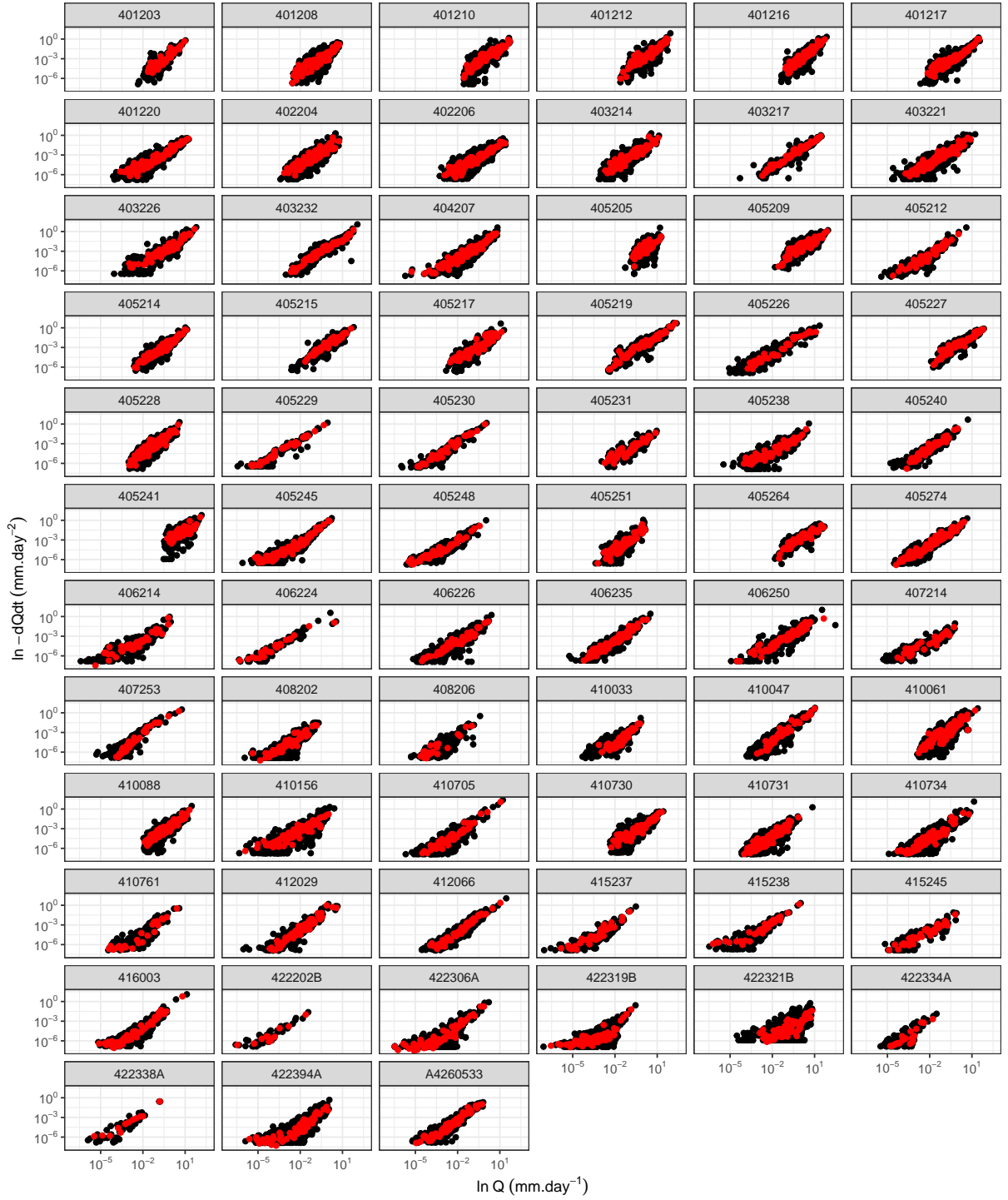| Parameter	Description	Minimum	Maximum
TT	Threshold temperature for snow and snow melt (°C)	-2	0.5
CFMAX	Degree-day factor for snow melt (mm/(°C.day))	1	10
SFCF	Snowfall correction factor	0.4	1.6
CWH	Liquid water holding capacity of the snowpack	0	0.2
CFR	Refreezing coefficient for water in the snowpack	0	0.1
FC	Maximim soil moisture storage (mm)	50	550
LP	Threshold for reduction of evaporation	0.3	1
BETA	Shape coefficient in soil rotine	1	6
PERC	Maximum percolation from upper to lower groundwater storages	0	0.3
UZL	Threshold for quick runoff (mm)	10	100
K0	Recession coefficient (quick runoff)	0.05	0.5
K1	Recession coefficient (upper groundwater storage)	0.01	0.4
K2	Recession coefficient (lower groundwater storage)	0.001	0.15
MAXBAS	Routing, length of triangular weighting function	1	14

Figure S1. Recession plots for each of the study catchments. Black dots are individual recession data points while the red dots represent binned values using the quantile method. Australian Water Resources Council station IDs are the title for each plot facet.

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Figure S2. Storage discharge relationships and dynamic catchment storage as estimated using the Kirchner (2009) method. Dynamic storage is presented relative to mean discharge. Australian Water Resources Council station IDs are the title for each plot facet.
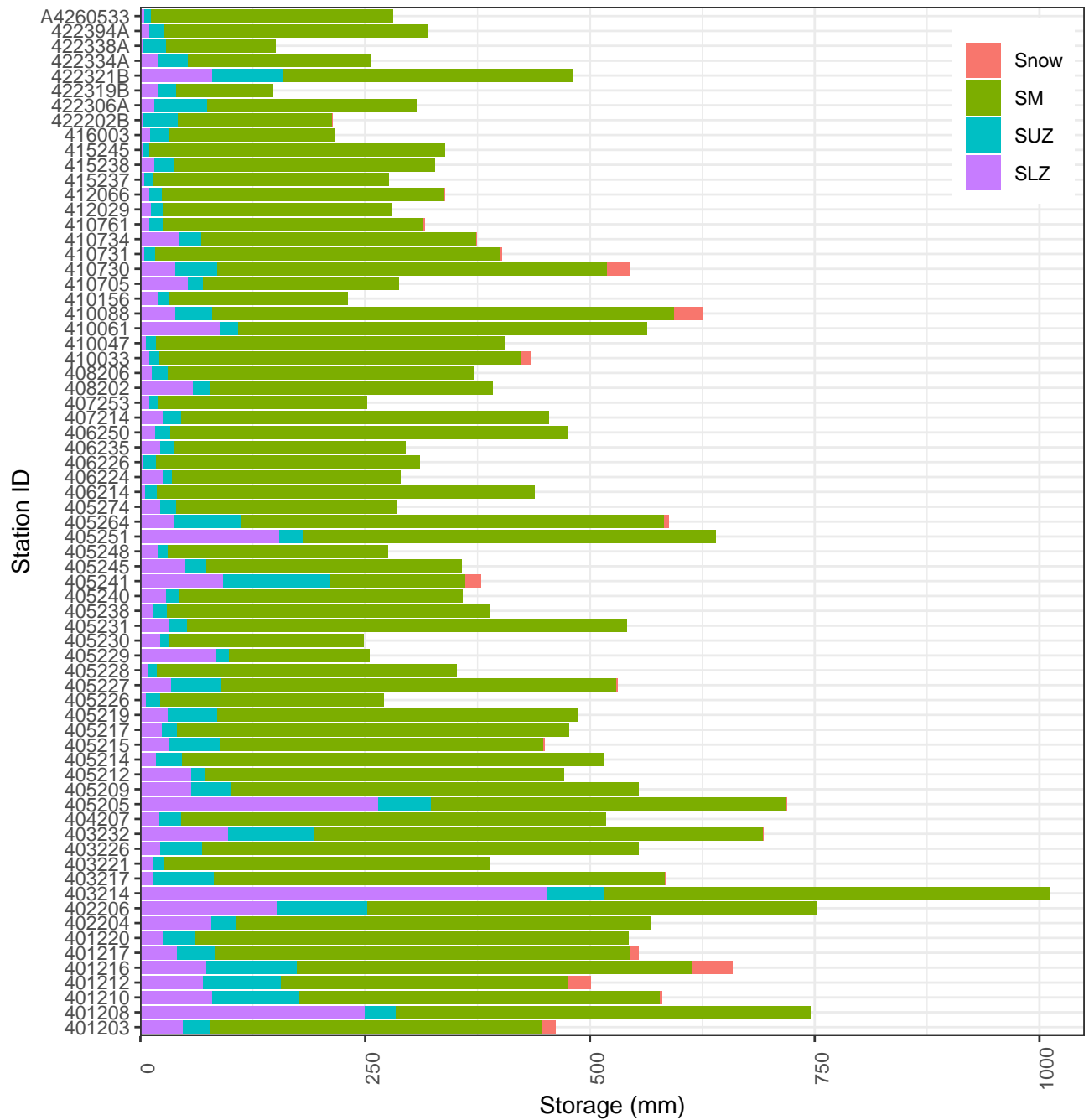
Figure S3. The extended dynamic storage for each study catchment as determined by the HBV method. The bars are coloured by the maximum size of the HBV model conceptual stores and are additive. The names of the stores refer to snow storage, soil moisture storage (SM), upper groundwater storage (SUZ) and lower groundwater storage (SLZ).

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Table S2. Spearman correlation coefficients between storage components in the HBV model and the catchment characteristics for extended dynamic storage. Bolded values are significant $(P < 0.05)$ correlations.

Characteristic	GW	Soil	Snow	Total
Area (km^2)	**-0.31**	-0.1	**0.26**	-0.2
Elev mean (m)	**0.44**	**0.34**	**0.73**	**0.47**
Elev range (m)	**0.47**	**0.58**	**0.63**	**0.66**
Slope (°)	**0.66**	**0.62**	**0.59**	**0.75**
Soil depth (m)	**0.5**	**0.52**	-0.11	**0.53**
Regolith depth (m)	**-0.25**	**-0.39**	**-0.42**	**-0.43**
Clay (%)	0.07	-0.2	**-0.31**	-0.18
Stream length (km)	-0.1	-0.04	-0.16	-0.1
Stream density (km/km^2)	-0.2	-0.22	-0.18	-0.22
PVB (%)	**-0.65**	**-0.56**	**-0.53**	**-0.73**
Silica Index	0.08	0.13	**0.26**	0.15
Igneous rocks (%)	0.04	0.02	0.1	0.09
Sedimentary rocks (%)	-0.05	0.11	-0.01	0.01
Metamorphic rocks (%)	0.14	**0.26**	**0.31**	**0.3**
Qcv	**-0.6**	**-0.66**	**-0.65**	**-0.78**
P/PET	**0.69**	**0.71**	**0.58**	**0.83**
Q/P	**0.66**	**0.61**	**0.52**	**0.76**
BFI	**0.58**	**0.7**	**0.59**	**0.82**
AC	**0.39**	**0.56**	**0.55**	**0.6**

Table S3. Spearman correlation coefficients between the actual evapotranspiration scaling parameter s_{ET} and the Budyko w parameter to catchment characteristics. Bolded values are significant ($P < 0.05$) correlations.

Characteristic	s_{ET}	w
Area (km^2)	-0.11	0.1
Elev mean (m)	**0.31**	-0.09
Elev range (m)	**0.55**	-0.05
Slope (°))	**0.63**	-0.17
Soil depth (m)	**0.55**	-0.13
Regolith depth (m)	**-0.4**	-0.1
Clay (%)	**-0.22**	**-0.3**
Stream length (km)	-0.13	0.14
Stream density (km/km^2)	**-0.18**	**-0.34**
PVB (%)	**-0.61**	0.2
Silica Index	**0.27**	0.03
Igneous rocks (%)	0.01	-0.09
Sedimentary rocks (%)	0.12	-0.01
Metamorphic rocks (%)	**0.24**	**0.33**
Qcv	**-0.69**	0.19
P/PET	**0.74**	-0.2
Q/P	**0.63**	**-0.45**
BFI	**0.68**	-0.21
AC	**0.54**	-0.23