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Supplement of

An ice core derived 1013-year catchment-scale annual rainfall reconstruction in subtropical eastern Australia

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S1 Introduction

This file contains supplementary information for the above article.

Table S1 shows the frequency of above/below average rainfall years for each century across the reconstruction period. Table S2 shows the frequency of ‘wet’ and ‘dry’ periods (as defined using Eq. 1 in the main paper) for each century and across the reconstruction period. The results of both Table S1 and Table S2 further highlight the inter-centennial climate variability and confirm that the instrumental period (in this case 1900-1999) does not well represent the true nature of climate variability in the WR catchment. Table S3 indicates various statistics of the rainfall distribution in each century and over the full reconstruction record.

Table S1. Indication of the frequency of below/above average periods of varying durations in each century from 1000-1999 and for the whole reconstruction record (1000-2012) expressed as the number of periods per 100 years. The number recorded in each cell represents the number of times the particular below/above average rainfall period was experienced in each century.

		No. of consecutive BELOW average years															
Period		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Frequency of BELOW average periods/100 years	1000-1099	8	5	5	4												
	1100-1199	12	7	6	1												
	1200-1299	10	11	3	1		1										
	1300-1399	17	3	2													
	1400-1499	13	5	1													
	1500-1599	8	2	4													
	1600-1699	12	4		1	1											
	1700-1799	15	3	4			1										
	1800-1899	14	2		1												
	1900-1999	9	8	2	2				1								
	1000-2012	11.8	4.9	2.9	1.0	0.1	0.2	0.1									
			No. of consecutive ABOVE average years														
Period		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Frequency of ABOVE average periods/100 years	1000-1099	7	4	9				1									
	1100-1199	11	6	5	4												
	1200-1299	17	5	3			1	1									
	1300-1399	9	3	3	2	1	1	1			2						
	1400-1499	5	3	3	2	1	2		1		1		1				
	1500-1599	2	3	1			3		1	2		1					
	1600-1699	3	5		3	2	3	1									1
	1700-1799	8	6	2	5		2	1									
	1800-1899	2	5	2	1	1	1		1		1	1					1
	1900-1999	9	8		3	2		1									
	1000-2012	7.4	4.7	2.8	2.1	0.7	1.3	0.6	0.3	0.2	0.4	0.2	0.1				0.2

Table S2. Frequency of ‘wet’ and ‘dry’ periods of varying durations in each century from 1000-1999 and for the whole reconstruction record (1000-2012) expressed as the number of periods per 100 years. The number recorded in each cell represents the number of times the particular below/above average rainfall period was experienced in each century. ‘Wet’ and ‘dry’ are defined using $x = 0.3$ in Eq. 1 in the main paper.

		No. of consecutive DRY years																																								
Period		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
Frequency of NOT WET periods/100 years	1000-1099	7	3	6	2	3		1																																		
	1100-1199	8	4	7				1		1	1																															
	1200-1299	7	5	3	1	1	1	1			1			1																												
	1300-1399	14	8	3																																						
	1400-1499	12	5	2	2																																					
	1500-1599	11	3	3	1																																					
	1600-1699	11	7	1		2																																				
	1700-1799	10	4	4	3					1																																
	1800-1899	12	6	1	1																																					
	1900-1999	9	8	3	3			1		1																																
1000-2012	10.1	5.2	3.4	1.3	0.7	0.3	0.3	0.2	0.2				0.1																													
Period		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
Frequency of NOT DRY periods/100 years	1000-1099	6	4	3		1	1	2		2																																
	1100-1199	5	6	2	6	1	2																																			
	1200-1299	7	8	3	1	1					1	1																														
	1300-1399	4	5	2	2	1	1			1		2	1																													
	1400-1499	1	1	4						3		2		1	1																											
	1500-1599	2	1		1		1	1					1							1																					1	
	1600-1699	2	1		2			2	2		1		1																													
	1700-1799	3	5	1	7					1			1	1																												
	1800-1899	2	1	1		2			1			1		1																											1	
	1900-1999	5	7	2	3	2				1		1																														
1000-2012	3.7	3.8	2.0	2.2	0.9	0.5	0.7	0.7	0.2	0.8	0.4	0.4	0.1							0.1																		0.1	0.1			

Table S3. For each century from 1000-1999 and the full reconstruction, the mean rainfall, the mean rainfall as a ratio of the instrumental mean (1100.0 mm), the percent of below/average years, and the number of ‘wet’ and ‘dry’ years. ‘Wet’ and ‘dry’ are defined using $x = 0.3$ in Eq. 1 in the main paper (see also Table 2 in the main paper).

Period	Mean (mm)	Mean relative to instrumental mean	% below average	% above average	% DRY years	% WET years
1000-1099	1107.6	1.01	49	51	61	68
1100-1199	1086.5	0.99	48	52	67	63
1200-1299	1098.1	1.00	51	49	62	62
1300-1399	1135.0	1.03	30	70	40	77
1400-1499	1153.5	1.05	25	75	35	84
1500-1599	1161.0	1.06	24	76	31	85
1600-1699	1140.5	1.04	29	71	37	83
1700-1799	1122.5	1.02	40	60	50	69
1800-1899	1156.4	1.05	21	79	30	86
1900-1999	1103.1	1.00	47	53	61	66
1000-2012	1126.1	1.02	37	63	48	74