Supplementary material

Multi-century cool and warm season rainfall reconstructions for Australia's major climatic regions

Mandy Freund[1,2,3], Benjamin J. Henley[1,2], David J. Karoly[1,2], Kathryn J. Allen[4], Patrick J. Baker[4]

[1]School of Earth Sciences, University of Melbourne, Parkville, Victoria, 3010, Australia
[2]ARC Centre of Excellence for Climate System Science, Australia
[3]Australian-German Climate and Energy College, University of Melbourne, Parkville, 3010, Australia
[4]School of Ecosystem and Forest Sciences, University of Melbourne, Richmond, Victoria, 3121, Australia

Correspondence to: Mandy Freund (mfreund@student.unimelb.edu.au)

Table S 1 Information on proxy data used in this study. Details on individual records are given in Column 1-9. Source 1: ANZDA (Palmer et al. 2015) and pers. comm. K. Allen and J. Palmer, Source 2: Aus2k (Neukom & Gergis 2011) and NOAA World Data Center for Paleoclimatology (WDCP), Source 3: Ocean2k (Tierney et al. 2015) and WDCP, Source 4: pers. comm. I. Heinrich. Resolution (Res) indicates the number of measurements per year. First year (FY) and Last year (LY) refer to the initial/end year of the record. Column 9- 16 refers individual records and to regions and seasons (W-warm season, C-cool season) by binary code (1=used, 0=not used).

Region	Source	Site	Type	Lat	Lon	Res	FY	LY	CS		EC		MD		MN		R		SS		SSWF		WT	
									W	C	W	C	W	C	W	C	W	C	W	C	W	C	W	C
Australasia	1	Sepanjang Kanuan Island Teak	TR	-7	115	1	1760	2000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Saradon Klangon Composite Teak	TR	-7	111	1	1644	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Saradan Java Teak	TR	-7	111	1	1689	2000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Pagerwunung Darupono Teak	TR	-7	110	1	1776	2004	1	1	0	1	0	0	0	0	0	1	0	1	1	1	0	0
Australasia	1	New Rosanne Composite Teak	TR	-7	111	1	1668	2004	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Muna Sulawesi Teak	TR	-5	123	1	1565	2005	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
Australasia	1	Klangon Natural Forest Teak	TR	-7	111	1	1644	2005	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
Australasia	1	Donoloyo Cagar Alam Java Teak	TR	-8	111	1	1617	2005	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Bekutuk Teak	TR	-8	111	1	1668	2004	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Windy Creek Noso	TR	-44	171	1	1760	2006	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Wilberforce Libi Xiong	TR	-43	171	1	1674	1992	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Warawara Plateau Forest Agau	TR	-35	173	1	1462	2002	1	0	0	0	1	0	0	1	1	0	1	1	1	0	0	1
Australasia	1	Waihora Stream Phgl Palmer	TR	-38	175	1	1550	1986	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Waihora Lagoon Phtr Palmer	TR	-38	175	1	1650	1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Waihaha Terrace Phtr Palmer	TR	-38	175	1	1613	1986	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Urewera Libi Xiong	TR	-38	177	1	1140	1992	1	0	1	0	1	0	0	0	1	0	1	0	1	1	0	0
Australasia	1	Trounson Kauri Park	TR	-35	173	1	1408	2002	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Totara Saddle Pink Pine Fenw	TR	-43	171	1	1590	1998	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Takapari Road Libi Xiong	TR	-40	176	1	1708	1995	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Takapari Libi Xiong	TR	-40	176	1	1256	1992	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Stratford Side East Egmont	TR	-39	175	1	1626	1990	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Slopedown Hill Pink Pine Fen	TR	-46	169	1	1447	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Ruahine Corner Libi Xiong	TR	-39	176	1	1473	1991	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Rata Creek Noso	TR	-44	171	1	1787	2006	1	1	1	1	0	1	0	1	1	1	0	0	1	1	1	1
Australasia	1	Rahu Saddle Libi Xiong	TR	-42	173	1	1560	1991	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Australasia	1	Pegasus Stewart Island	TR	-47	167	1	1667	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Putara Habi Darigo	TR	-40	175	1	1646	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Puketi Forest Agau	TR	-35	173	1	1504	2002	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Australasia	1	Puketi Bluff Agau Moinuddin	TR	-35	173	1	1675	1981	1	0	0	0	1	0	0	1	1	0	1	1	1	0	0	1
Australasia	1	Oroko Silver Pine Cook	TR	-43	170	1	1400	1999	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Australasia	1	Omoeroa Saddle Pink Pine Fen	TR	-43	171	1	1578	1999	1	0	1	0	1	0	0	0	1	0	1	0	1	1	0	0
Australasia	1	Ohutu Ridge Libi	TR	-39	177	1	1585	1991	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	North Egmont Libi Xiong	TR	-39	175	1	1625	1990	0	1	1	1	0	1	1	1	0	1	0	1	1	1	1	1
Australasia	1	Mount William Agau	TR	-37	175	1	1590	1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Mount Te Kinga Pink Pine Fen	TR	-42	171	1	1450	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Mount Greenland Pink Pine Fe	TR	-43	170	1	1400	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Mount Glasgow Pink Pine Fenw	TR	-41	172	1	1461	1999	1	1	0	1	0	0	0	0	0	0	1	0	1	1	0	0
Australasia	1	Mount French Pink Pine Fenwi	TR	-42	171	1	1367	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Mount French Cedar Fenwick	TR	-42	171	1	1330	1999	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Mount Elliot Pink Pine Fenwi	TR	-42	172	1	1440	1999	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Mount Egmont Libi Lamarche	TR	-39	174	1	1616	1990	1	1	0	1	1	0	0	0	0	0	1	0	1	1	0	1
Australasia	1	Mount Cargill Libi	TR	-46	170	1	1492	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Mount Bonar Pink Pine Fenwic	TR	-44	170	1	1463	1999	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Moa Park Libi Xiong	TR	-41	173	1	1490	1991	1	0	1	0	1	0	0	0	1	0	1	0	1	1	0	0
Australasia	1	Matiri Range Pink Pine Fenwi	TR	-41	172	1	1508	1999	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Manaia Sanctuary Agau	TR	-37	175	1	1269	1998	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Little Barrier Island Agau	TR	-36	176	1	1790	1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Lake Peasron Noso	TR	-44	171	1	1713	2006	0	1	1	1	0	1	1	1	0	1	0	1	1	1	1	1
Australasia	1	Kawhia Agau	TR	-38	175	1	1710	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Katikati Agau	TR	-37	176	1	1698	1996	1	0	1	0	1	0	0	0	1	0	1	0	1	1	0	0
Australasia	1	Hellfire Ruggedy Mt 360	TR	-47	167	1	1604	2013	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Huia (Waitakeres) Agau	TR	-37	174	1	1720	1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Huapai 90m	TR	-36	174	1	1483	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Australasia	1	Hihitahi Libi Xiong	TR	-39	175	1	1431	1991	0	1	1	1	0	1	1	1	0	1	0	1	1	1	1	1
Australasia	1	Hidden Valley Agau	TR	-36	175	1	1679	2002	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Hauhungatahi Site-C Tongarir	TR	-39	175	1	1213	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Hauhungatahi Site-B Tongarir	TR	-39	175	1	1332	1992	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Hauhungatahi Site-A Tongarir	TR	-39	175	1	1511	1992	1	0	1	0	1	0	0	0	1	0	1	0	1	1	0	0
Australasia	1	Ghost Creek Noso	TR	-43	171	1	1795	2006	1	1	0	1	1	1	1	1	0	1	0	1	0	1	0	1
Australasia	1	Flanagans Hut Libi Xiong	TR	-41	172	1	1683	1991	1	1	1	1	0	1	0	1	1	1	0	0	1	1	1	1
Australasia	1	Flagstaff Creek Silver Pine	TR	-42	171	1	1230	2003	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Eldrig Peak Pink Pine Fenwic	TR	-45	167	1	1338	1999	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1
Australasia	1	Doughboy Adams Hill	TR	-47	167	1	1457	2010	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
Australasia	1	Croesus Track Pink Pine Fenw	TR	-42	171	1	1483	1999	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Clearwater Libi Xiong	TR	-39	177	1	1450	1991	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Cascades Agau Fowler	TR	-37	174	1	1559	1982	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
Australasia	1	Camp Creek Pink Pine Fenwick	TR	-42	171	1	1410	1998	1	1	0	1	0	0	0	0	0	0	1	0	1	1	0	0
Australasia	1	Camp Creek Cedar Fenwick	TR	-42	171	1	1400	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Borland Silver Beech Cook	TR	-45	167	1	1389	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Ahaura Libi Xiong	TR	-42	171	1	1525	1992	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
Australasia	1	Ahaura Laco Cook	TR	-42	171	1	1209	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Westcost Celery	TR	-41	145	1	1467	1994	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Warra Lowcelery1	TR	-43	147	1	1653	1998	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Warra Highcelery1	TR	-43	147	1	1543	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	The Walls1	TR	-41	146	1	1376	2004	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Tnewtt2	TR	-42	146	1	1657	2012	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Tneden1	TR	-42	146	1	1679	2012	1	1	0	1	0	0	0	0	0	0	1	0	1	1	0	0
Australasia	1	Reservoir1	TR	-43	146	1	1664	2008	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Pine Lake Mickey1	TR	-41	146	1	1277	2009	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Northeast Celery	TR	-41	148	1	1235	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Mount Read1	TR	-42	145	1	400	2009	1	0	0	0	1	0	0	1	1	0	1	1	1	0	0	1
Australasia	1	Mount Field1	TR	-42	146	1	1028	2008	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Mickey Creek3	TR	-41	146	1	1355	2009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Mickey Creek2	TR	-41	146	1	1354	2010	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Mesa1	TR	-44	146	1	1708	2011	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	Mersey Valley1	TR	-41	146	1	1620	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	M Tnewtl	TR	-42	146	1	1730	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	M Tnerdl	TR	-42	146	1	1730	2009	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Australasia	1	M Tnerde	TR	-42	146	1	1730	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	M Tnednl	TR	-42	146	1	1730	2009	1	1	0	1	0	0	0	0	0	0	1	0	1	1	0	0
Australasia	1	M Mickeycreek4	TR	-41	146	1	1690	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	M Mickeycreek3	TR	-41	146	1	1650	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	M February Creek4	TR	-41	146	1	1750	2011	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	M February Creek3	TR	-41	146	1	1750	2011	1	1	0	1	0	0	0	0	0	0	1	0	1	1	0	0
Australasia	1	M February Creek2	TR	-41	146	1	1750	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Lake Vera1	TR	-42	146	1	180	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Lake Riveaux	TR	-43	146	1	1412	2009	1	1	0	1	1	1	1	1	0	1	0	1	0	1	0	1
Australasia	1	Lake Mackenzie1	TR	-41	146	1	1344	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Laek Marilyn	TR	-42	146	1	1058	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Kingbilly1	TR	-43	146	1	1587	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Huon Pine3	TR	-43	145	1	1750	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Huon Pine2	TR	-43	145	1	1770	2009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	1	Huon Pine1	TR	-43	145	1	1770	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	February Creek5	TR	-41	146	1	1750	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	February Creek4	TR	-41	146	1	1481	2011	1	0	0	0	1	0	0	1	1	0	1	1	1	0	0	1
Australasia	1	February Creek3	TR	-41	146	1	1599	2011	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	1	February Creek2	TR	-41	146	1	1583	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	February Creek1	TR	-41	146	1	1583	2011	0	1	1	1	0	1	1	1	0	1	0	1	1	1	1	1
Australasia	1	Cradel Mountkindbilly	TR	-41	146	1	302	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Cpt Southwest1	TR	-42	146	1	1525	2012	1	0	0	0	1	0	0	1	1	0	1	1	1	0	0	1
Australasia	1	Buckleys Chance1	TR	-42	146	1	462	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	1	Arrowsmith1	TR	-42	147	1	1541	1998	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Australasia	4	Lamington Processed Tuc	TR	-28	153	1	1855	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	4	Atherton Processed Tuc	TR	-17	145	1	1812	2000	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0
Australasia	3	Juna Downs Gully, Western Australia	TR	-22	118	1	1762	2012	1	1	0	1	0	0	0	0	0	0	1	0	1	1	0	0
Australasia	3	Viet001 Col	TR	12	108	1	1030	2008	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Africa	3	Zimbabwe	TR	-18	27	1	1796	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Ocean	3	Moorea	C	-17	211	1	1852	1990	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
Pacific Ocean	3	Avaiki	Sp	-19	191	1	1829	2001	0	1	1	1	0	1	1	1	0	1	0	1	1	1	1	1
Australasia	2	Baw Baw	TR	-36	148	1	1780	2008	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Indian Ocean	3	Malindi	C	-3	40	1	1801	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	2	Rowley Shoals	C	-17	119	1	1798	2009	0	1	1	1	0	1	1	1	0	1	0	1	1	1	1	1
Australasia	2	Houtman Abrolhos Composite	C	-28	113	1	1795	2010	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Pacific Ocean	2	Tonga Th1	C	-19	186	1	1794	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	3	Tonga Th1	C	-20	185	1	1791	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indian Ocean	2	Rodrigues	C	-19	63	1	1789	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	2	Teak Indonesia	TR	-7	111	1	1565	2005	1	0	0	0	1	0	0	1	1	0	1	1	1	0	0	1
Antarctica	2	Itase 2001 5	IC	-77	271	1	1592	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Ocean	3	Savusavu, Fiji	C	-16	179	1	1776	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Antarctica	2	Vostok Pits	IC	-78	106	1	1774	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	2	Wa Callitris	TR	-33	120	1	1601	2005	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	2	Stewart Island	TR	-47	168	1	1604	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Antarctica	2	Princess Elizabeth Land	IC	-70	77	1	1745	1996	1	1	1	1	0	1	0	1	1	1	0	0	1	1	1	1
Indian Ocean	2	Ifaty 4	C	-23	43	1	1660	1994	1	1	0	1	1	1	1	1	0	1	0	1	0	1	0	1
Indian Ocean	2	Ifaty 4 Sr/Ca	C	-23	43	1	1658	1994	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Antarctica	2	Siple Dome B	IC	-81	212	1	1000	1994	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
Australasia	3	Ni Libi Composite 2	TR	-39	174	1	1616	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	2	Gbr Ne Australia Rainfall Recon	C	-18	147	1	1639	1981	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	3	Moa Park	TR	-41	173	1	1490	1991	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pacific Ocean	3	Urvina, Galapagos Islands	C	0	269	1	1607	1981	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Australasia	2	Kauri Nz	TR	-36	174	1	1269	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	2	Mangawhero	TR	-39	175	1	1437	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	2	Ctp West Tasmania	TR	-42	146	1	1290	1998	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	3	Ni Libi Composite 1	TR	-39	175	1	1332	1992	1	1	0	1	0	0	0	0	0	0	1	0	1	1	0	0
Antarctica	3	Wdc05q Accumulation	IC	-79	248	1	1521	2004	1	1	0	1	1	1	1	1	0	1	0	1	0	1	0	1
Australasia	2	Pink Pine Nz	TR	-42	172	1	1367	1999	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	2	Ctp East Tasmania	TR	-42	148	1	1152	1994	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Antarctica	2	Siple Station	IC	-75	276	1	1417	1983	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1
Antarctica	2	Law Dome Na	IC	-66	112	1	1301	1995	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Antarctica	2	Law Dome Chemical Data	IC	-66	112	1	1301	1995	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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Australasia	2	Chillagoe Ch1	Sp	-17	145	1	1227	2003	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Antarctica	3	Talos	IC	-72	159	1	1217	1996	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1
Antarctica	2	Law Dome Sss	IC	-66	112	1	1000	2009	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	1
Antarctica	2	Law Dome Na New	IC	-66	112	1	1000	2009	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
Australasia	2	Oroko Swamp	TR	-43	171	1	0	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	2	Cape Range Cr1	Sp	-22	114	1	511	2010	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Antarctica	2	Law Dome New	IC	-66	112	1	179	2007	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	2	Flores Indonesia	Sp	-4	119	1	5	2005	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	2	Huon Pine Mt. Read Tasmania	TR	-42	147	1	-1600	2001	0	1	1	1	0	1	1	1	0	1	0	1	1	1	1	1
Australasia	3	Madang Lagoon	C	-5	145	4	1880	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	3	Ningaloo	C	-21	113	6	1879	1995	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pacific Ocean	3	Rarotonga 3r	C	-21	201	8	1874	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indian Ocean	3	Mayotte	C	-12	45	6	1865	1993	1	1	0	1	1	1	1	1	0	1	0	1	0	1	0	1
Australasia	3	Bunaken	C	2	123	12	1860	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australasia	3	Mentawai West Sumatra	C	-4	98	12	1858	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Ocean	2	Tonga Tni2	C	-20	186	8	1848	2004	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
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Pacific Ocean	3	Maiana	C	1	173	6	1840	1994	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Indian Ocean	3	La Reunion	C	-21	55	6	1832	1995	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pacific Ocean	3	Palau Ulong	C	7	134	12	1793	2008	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Pacific Ocean	3	Guam	C	13	145	12	1790	2000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australasia	3	Bali	C	-8	115	12	1782	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indian Ocean	2	Rodrigues Sr/Ca	C	-19	63	12	1781	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Ocean	2	Fiji 1f	C	-16	179	8	1780	1997	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pacific Ocean	2	Fiji 1f	C	-16	179	12	1780	1997	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pacific Ocean	3	Rarotonga	C	-21	201	8	1726	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Ocean	3	Rarotonga	C	-21	201	8	1726	1997	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Indian Ocean	3	Ifaty, Madagascar	C	-23	43	6	1659	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Ocean	3	Amedee New Caledonia	C	-22	167	4	1657	1993	1	0	0	0	1	0	0	1	1	0	1	1	1	0	0	1
Pacific Ocean	3	Amedee New Caledonia	C	-22	167	12	1648	1999	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Indian Ocean	2	Mafia, Tanzania	C	-8	40	8	1622	1998	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pacific Ocean	2	Fiji Ab	C	-16	179	8	1617	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Ocean	3	Espiritu Santo, Vanuatu	Sp	-16	167	4	1557	2003	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pacific Ocean	3	Palmyra Island Floating	C	5	198	12	928	1998	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	0

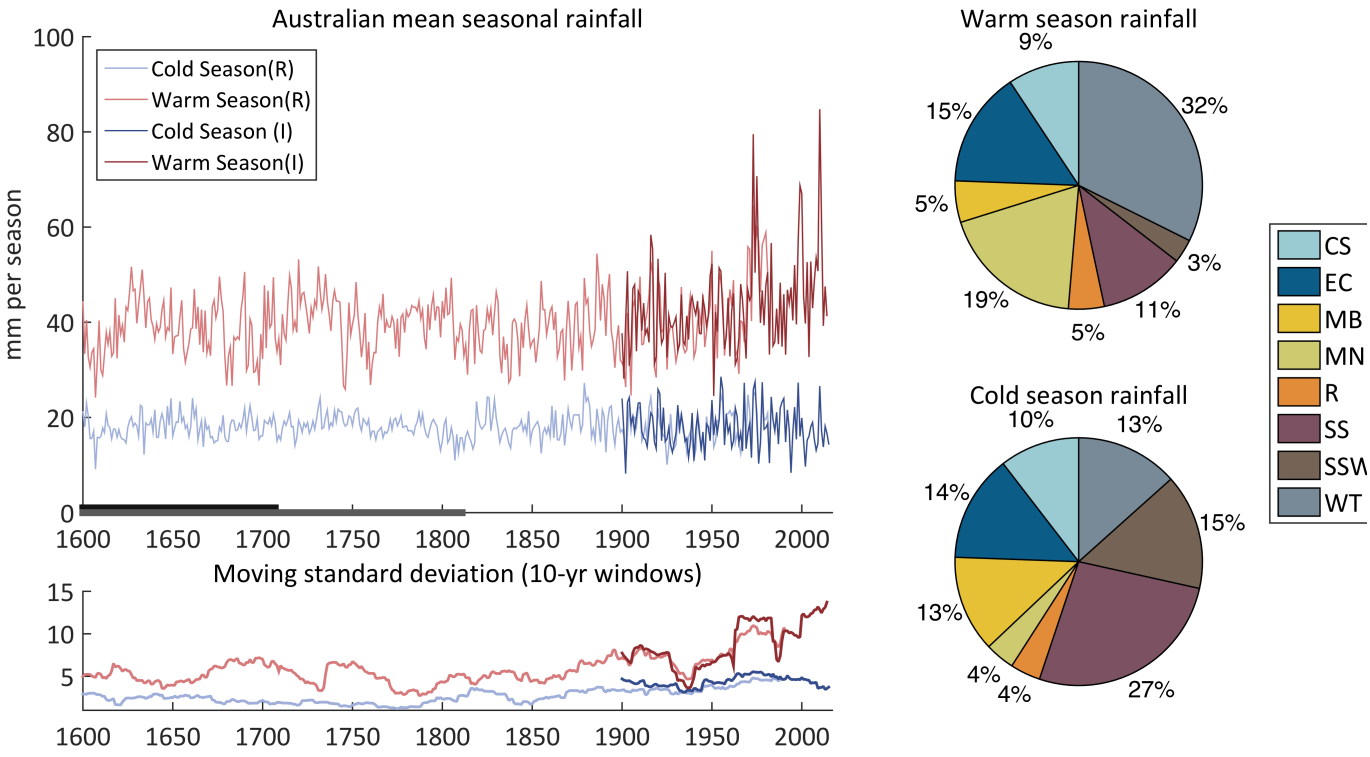

Figure S1 Top: Time series of seasonal rainfall area averaged for all NRM regions in Australia. Bars on the bottom indicate time periods which one or more regions are not positive verified (Dark grey=warm season, light grey= cool season). Bottom: 10-year moving standard deviation for instrumental and reconstructed rainfall all Australian rainfall. Right: Pie charts attribute the amount of seasonal rainfall to individual NRM regions (Upper: warm season, Lower: cool season). Note that periods not verified were still used to build in this average

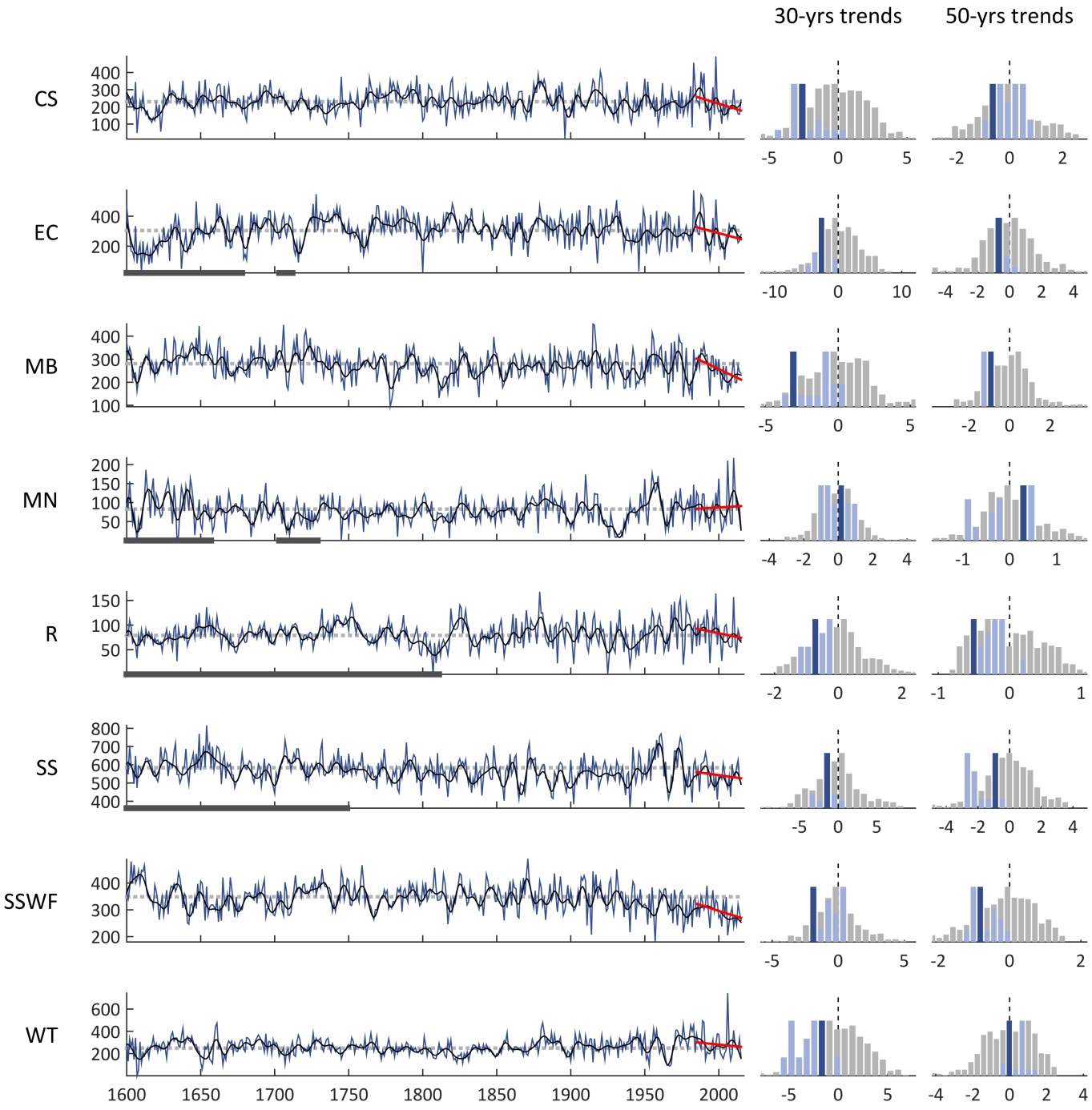

Figure S 3. Cool season time series plot and trend estimation for each NRM cluster region. Left panels show regional rainfall reconstructions since 1600 for cool seasons (blue colour) with 10-yr (black line) low pass Chebyshev filter. Grey bars along the x-axis denote non-verified periods for each reconstruction. Right: Histogram of 30-yr and 50-yr regional trends on mm/yr. Light colouring highlights recent trends beginning since 1970/1950 for

30/50-yr periods whereas the dark coloured bar indicates the most recent trend. Bar heights are normalised by the maximum occurrence for each region.

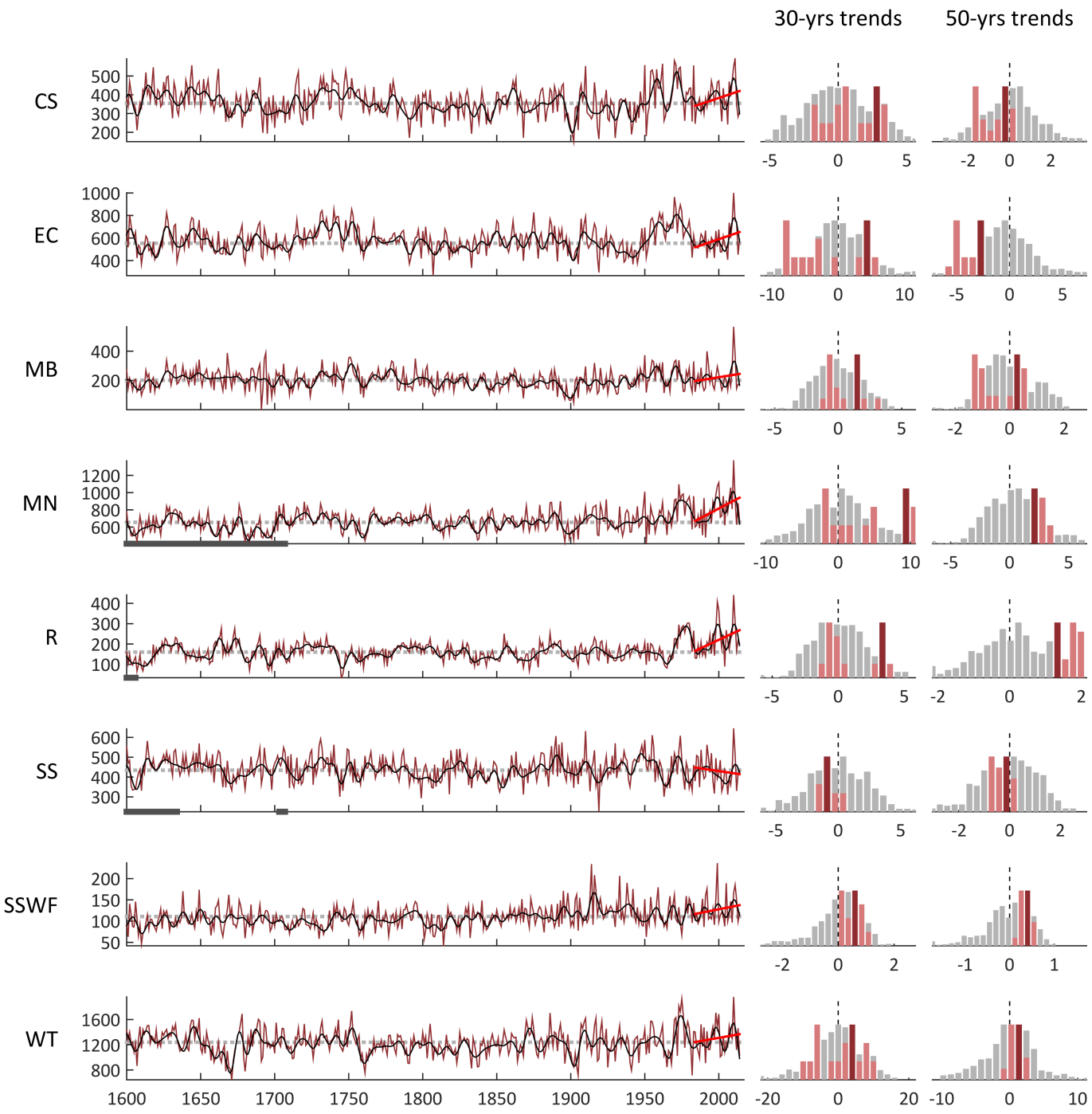

Figure S4. Warm season time series plot and trend estimation for each NRM cluster region. Left panels show regional rainfall reconstructions since 1600 for cool seasons (red colour) with 10-yr (black line) low pass Chebyshev filter. Grey bars along the x-axis denote

non-verified periods for each reconstruction. Right: Histogram of 30-yr and 50-yr regional trends in mm/yr. Light colouring highlights recent trends beginning since 1970/1950 for 30/50-yr periods whereas the dark coloured bar indicates the most recent trend. Bar heights are normalised by the maximum occurrence for each region.

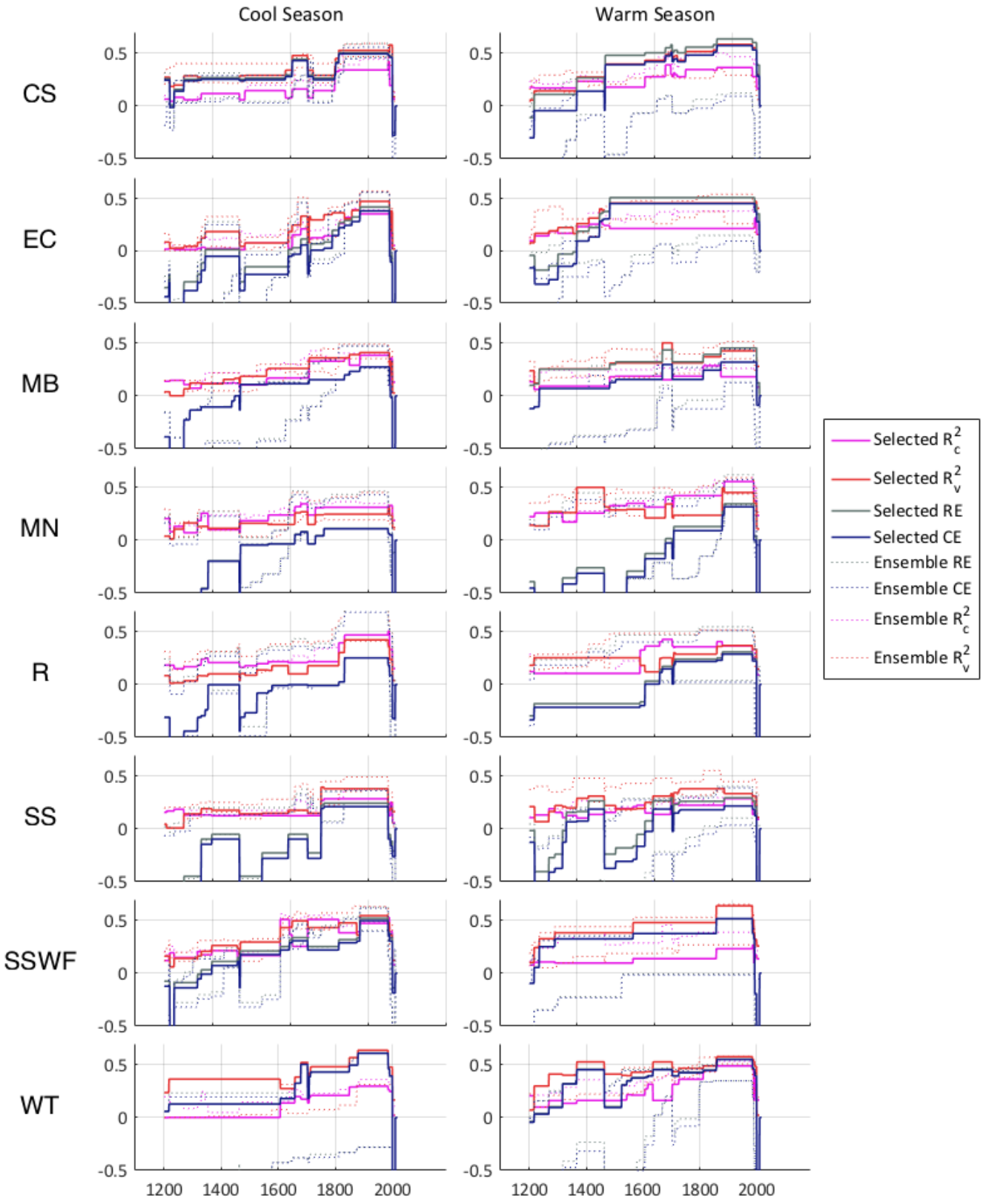

Figure S5. Regional calibration and verification statistics for the cool and warm season.

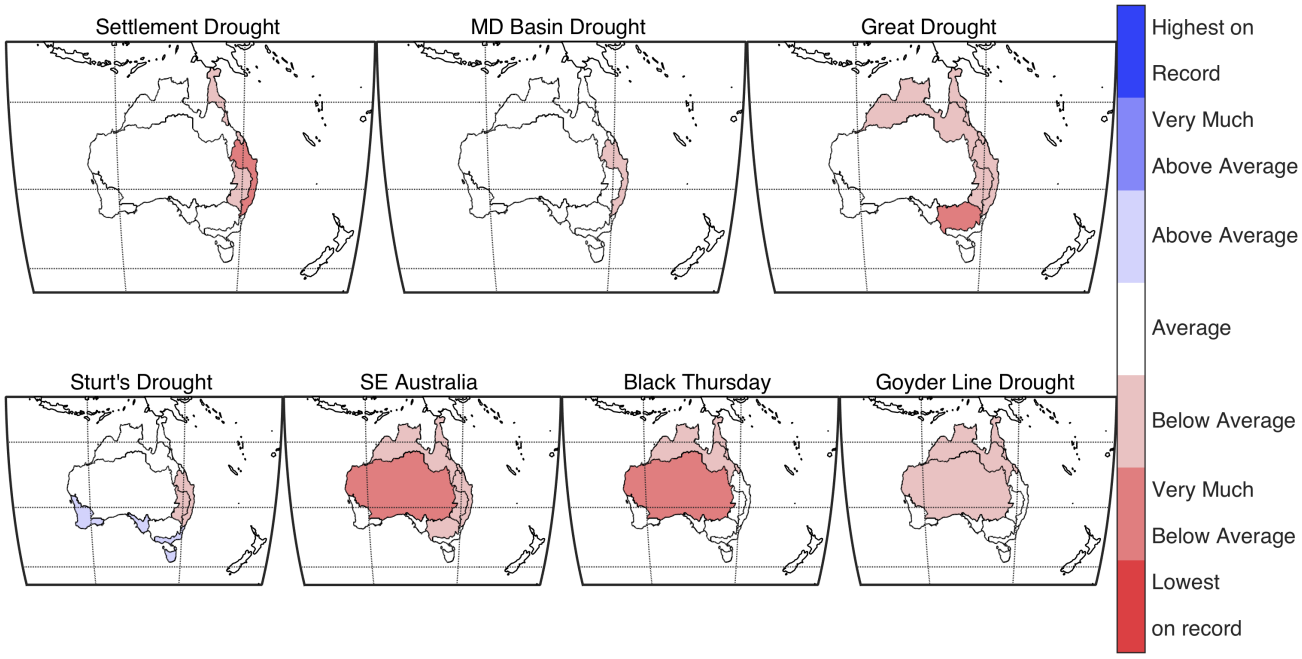

Figure S6. Additional annual deciles for historical droughts.

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