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**Evaluating the shifts in rainfall and pasture-growth variabilities across the pastoral zone of Australia during 1910–2010**

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**Table S1.** Proportions of land area (expressed as pixel counts and the corresponding percentage) in each class of the index of rainfall variability for regions in the three Australian agricultural zones during the 1910-1960 and 1961-2010 periods. Differences in proportion  $\geq 10\%$  (absolute value) between the 2 periods are highlighted in red.

Agricultural zone	Agricultural region	Index of variability	Period		Difference between periods (%)
			1910-1960	1961-2010	
Pastoral	Northern Territory (NT) Alice Springs Districts (N:AS)	Extreme (> 2)	524 (5.8)	496 (5.5)	0
		Very High (1.5,2)	580 (6.4)	3435 (37.8)	31
		High (1.25,1.5)	2936 (32.3)	3792 (41.8)	9
		Moderate to High (1,1.25)	3651 (40.2)	1301 (14.3)	-26
		Moderate (0.75,1)	1391 (15.3)	58 (0.6)	-15
		Low to Moderate (0.5,0.75)	0 (0)	0 (0)	0
		Low (0,0.5)	0 (0)	0 (0)	0
	NT Barkly Tablelands (N:BT)	Extreme (> 2)	0 (0)	6 (0.1)	0
		Very High (1.5,2)	4 (0)	843 (8.9)	9
		High (1.25,1.5)	226 (2.4)	3687 (38.8)	36
		Moderate to High (1,1.25)	3426 (36)	4338 (45.6)	10
		Moderate (0.75,1)	5687 (59.8)	633 (6.7)	-53
		Low to Moderate (0.5,0.75)	166 (1.7)	2 (0)	-2
		Low (0,0.5)	0 (0)	0 (0)	0
	NT Top End Darwin (N:TE)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		Moderate (0.75,1)	25 (1.7)	70 (4.8)	3
		Low to Moderate (0.5,0.75)	672 (46)	433 (29.6)	-16
		Low (0,0.5)	764 (52.3)	958 (65.6)	13
	NT Victoria River District – Katherine (N:VR)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	68 (0.6)	92 (0.8)	0
		Moderate to High (1,1.25)	815 (7.1)	1461 (12.7)	6
		Moderate (0.75,1)	2685 (23.4)	4113 (35.8)	12
		Low to Moderate (0.5,0.75)	7164 (62.4)	5470 (47.6)	-15
		Low (0,0.5)	755 (6.6)	351 (3.1)	-4
	New South Wales (NSW) Far West (NS:FW)	Extreme (> 2)	0 (0)	23 (0.2)	0
		Very High (1.5,2)	258 (2.3)	559 (4.9)	3
		High (1.25,1.5)	725 (6.4)	988 (8.7)	2
		Moderate to High (1,1.25)	5676 (49.8)	5718 (50.1)	0
		Moderate (0.75,1)	3915 (34.3)	3614 (31.7)	-3
		Low to Moderate (0.5,0.75)	831 (7.3)	503 (4.4)	-3
		Low (0,0.5)	0 (0)	0 (0)	0
	Queensland (QLD) Charleville – Longreach (Q:CL)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	161 (2.9)	9 (0.2)	-3
		High (1.25,1.5)	1709 (31.1)	79 (1.4)	-30
		Moderate to High (1,1.25)	2859 (52)	983 (17.9)	-34
		Moderate (0.75,1)	771 (14)	3683 (67)	53
Low to Moderate (0.5,0.75)		0 (0)	746 (13.6)	14	
Low (0,0.5)		0 (0)	0 (0)	0	

Pastoral

High Rainfall

QLD Central North (Q:CN)	Extreme (> 2)	0 (0)	0 (0)	0
	Very High (1.5,2)	0 (0)	0 (0)	0
	High (1.25,1.5)	179 (1.7)	340 (3.2)	2
	Moderate to High (1,1.25)	4019 (37.8)	4892 (46)	8
	Moderate (0.75,1)	3935 (37)	4934 (46.4)	9
	Low to Moderate (0.5,0.75)	2505 (23.5)	472 (4.4)	-19
	Low (0,0.5)	0 (0)	0 (0)	0
QLD Cape York and the Gulf (Q:CY)	Extreme (> 2)	0 (0)	0 (0)	0
	Very High (1.5,2)	0 (0)	317 (4.2)	4
	High (1.25,1.5)	0 (0)	1427 (18.8)	19
	Moderate to High (1,1.25)	3 (0)	1009 (13.3)	13
	Moderate (0.75,1)	2985 (39.3)	1601 (21.1)	-18
	Low to Moderate (0.5,0.75)	3847 (50.6)	2650 (34.8)	-16
	Low (0,0.5)	770 (10.1)	601 (7.9)	-2
QLD West and South West (Q:WS)	Extreme (> 2)	644 (3.3)	11 (0.1)	-3
	Very High (1.5,2)	5316 (26.9)	2311 (11.7)	-15
	High (1.25,1.5)	6940 (35.1)	8112 (41.1)	6
	Moderate to High (1,1.25)	4554 (23)	6986 (35.4)	12
	Moderate (0.75,1)	2236 (11.3)	2337 (11.8)	1
	Low to Moderate (0.5,0.75)	0 (0)	2 (0)	0
	Low (0,0.5)	69 (0.3)	0 (0)	0
South Australia (SA) Northern Pastoral (S:NP)	Extreme (> 2)	699 (3.1)	292 (1.3)	-2
	Very High (1.5,2)	5560 (24.4)	7420 (32.5)	8
	High (1.25,1.5)	3922 (17.2)	4872 (21.4)	4
	Moderate to High (1,1.25)	6537 (28.7)	5470 (24)	-5
	Moderate (0.75,1)	4279 (18.8)	3238 (14.2)	-5
	Low to Moderate (0.5,0.75)	1801 (7.9)	1506 (6.6)	-1
	Low (0,0.5)	0 (0)	0 (0)	0
Western Australia (WA) The Kimberley (W:K)	Extreme (> 2)	0 (0)	0 (0)	0
	Very High (1.5,2)	26 (0.2)	98 (0.8)	1
	High (1.25,1.5)	140 (1.1)	889 (7)	6
	Moderate to High (1,1.25)	1515 (11.9)	1714 (13.4)	2
	Moderate (0.75,1)	6363 (49.9)	5834 (45.7)	-4
	Low to Moderate (0.5,0.75)	4714 (36.9)	4223 (33.1)	-4
	Low (0,0.5)	0 (0)	0 (0)	0
WA Pilbara and Central Pastoral (W:PC)	Extreme (> 2)	100 (0.3)	4 (0)	0
	Very High (1.5,2)	3072 (8)	942 (2.5)	-5
	High (1.25,1.5)	10829 (28.1)	9904 (26.7)	-1
	Moderate to High (1,1.25)	14670 (38.1)	17960 (48.3)	10
	Moderate (0.75,1)	7121 (18.5)	6447 (17.4)	-1
	Low to Moderate (0.5,0.75)	1360 (3.5)	1837 (4.9)	1
	Low (0,0.5)	1361 (3.5)	58 (0.2)	-3
NSW Coastal (NS:C)	Extreme (> 2)	0 (0)	0 (0)	0
	Very High (1.5,2)	0 (0)	0 (0)	0
	High (1.25,1.5)	0 (0)	0 (0)	0
	Moderate to High (1,1.25)	0 (0)	27 (0.9)	1
	Moderate (0.75,1)	466 (15.4)	936 (30.9)	16
	Low to Moderate (0.5,0.75)	2556 (84.4)	2048 (67.6)	-17
	Low (0,0.5)	8 (0.3)	19 (0.6)	0
NSW Tablelands (Northern Central and Southern)	Extreme (> 2)	0 (0)	0 (0)	0

High Rainfall

QLD Northern Coastal - Mackay to Cairns (Q:NC)	(NS:T)	Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		Moderate (0.75,1)	176 (4.1)	157 (3.6)	0
		Low to Moderate (0.5,0.75)	3711 (85.8)	3238 (74.9)	-11
		Low (0,0.5)	438 (10.1)	930 (21.5)	11
		Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	4 (0.2)	6 (0.3)	0
		Moderate to High (1,1.25)	987 (53.6)	589 (32)	-22
		Moderate (0.75,1)	410 (22.3)	904 (49.1)	27
		Low to Moderate (0.5,0.75)	440 (23.9)	342 (18.6)	-5
		Low (0,0.5)	0 (0)	0 (0)	0
		Extreme (> 2)	0 (0)	0 (0)	0
	QLD Southern Coastal - Curtis to Moreton (Q:SC)		Very High (1.5,2)	0 (0)	0 (0)
		High (1.25,1.5)	0 (0)	5 (0.1)	0
		Moderate to High (1,1.25)	349 (7.8)	434 (9.8)	2
		Moderate (0.75,1)	1835 (41.2)	1342 (30.2)	-11
		Low to Moderate (0.5,0.75)	2266 (50.9)	2524 (56.7)	6
		Low (0,0.5)	0 (0)	145 (3.3)	3
		Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
SA South East (S:SE)		Moderate (0.75,1)	0 (0)	0 (0)	0
		Low to Moderate (0.5,0.75)	451 (27.5)	345 (21)	-6
		Low (0,0.5)	1188 (72.5)	1294 (79)	6
		Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
Tasmania (TAS)		Moderate (0.75,1)	0 (0)	0 (0)	0
		Low to Moderate (0.5,0.75)	1156 (39.3)	927 (31.6)	-8
		Low (0,0.5)	1782 (60.7)	2011 (68.4)	8
		Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
Victoria (VIC) Southern and Eastern Victoria (V:SE)		Moderate (0.75,1)	0 (0)	1 (0)	0
		Low to Moderate (0.5,0.75)	2108 (42)	2520 (50.2)	8
		Low (0,0.5)	2912 (58)	2499 (49.8)	-8
		Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
WA South West Coastal (W:SW)		Moderate (0.75,1)	0 (0)	0 (0)	0
		Low to Moderate (0.5,0.75)	477 (24.5)	93 (4.8)	-20
		Low (0,0.5)	1468 (75.5)	1852 (95.2)	20
		Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
NSW Central West (NS:CW)		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		Extreme (> 2)	0 (0)	0 (0)	0

## Wheat Sheep

		Moderate (0.75,1)	1263 (39.9)	1071 (33.8)	-6
		Low to Moderate (0.5,0.75)	1905 (60.1)	2097 (66.2)	6
		Low (0,0.5)	0 (0)	0 (0)	0
	NSW North West Slopes and Plains (NS:NW)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	156 (3.3)	21 (0.5)	-3
		Moderate (0.75,1)	2809 (60.2)	1355 (29.1)	-31
		Low to Moderate (0.5,0.75)	1697 (36.4)	3085 (66.2)	30
		Low (0,0.5)	1 (0)	202 (4.3)	4
	NSW Riverina (NS:R)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		Moderate (0.75,1)	1024 (25.2)	1699 (41.7)	17
		Low to Moderate (0.5,0.75)	3046 (74.8)	2371 (58.3)	-17
		Low (0,0.5)	0 (0)	0 (0)	0
	QLD Eastern Darling Downs (Q:ED)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		Moderate (0.75,1)	80 (7)	0 (0)	-7
		Low to Moderate (0.5,0.75)	1065 (92.9)	1076 (93.8)	1
		Low (0,0.5)	2 (0.2)	71 (6.2)	6
	QLD Western Downs and Central Highlands (Q:WD)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	9 (0.1)	50 (0.5)	0
		Moderate (0.75,1)	1583 (17)	3679 (39.6)	23
		Low to Moderate (0.5,0.75)	5607 (60.3)	5491 (59.1)	-1
		Low (0,0.5)	2096 (22.5)	75 (0.8)	-22
	SA Eyre Peninsula (S:EP)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		Moderate (0.75,1)	57 (3.3)	105 (6.1)	3
		Low to Moderate (0.5,0.75)	1574 (92)	1546 (90.4)	-2
		Low (0,0.5)	79 (4.6)	59 (3.5)	-1
	SA Murray Lands and Yorke Peninsula (S:ML)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		Moderate (0.75,1)	447 (18.3)	169 (6.9)	-11
		Low to Moderate (0.5,0.75)	1963 (80.5)	1975 (81)	0
		Low (0,0.5)	28 (1.1)	294 (12.1)	11
	VIC Central North (V:CN)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		Moderate (0.75,1)	129 (9.6)	51 (3.8)	-6
		Low to Moderate (0.5,0.75)	1191 (89)	1283 (95.9)	7
		Low (0,0.5)	18 (1.3)	4 (0.3)	-1

Wheat Sheep

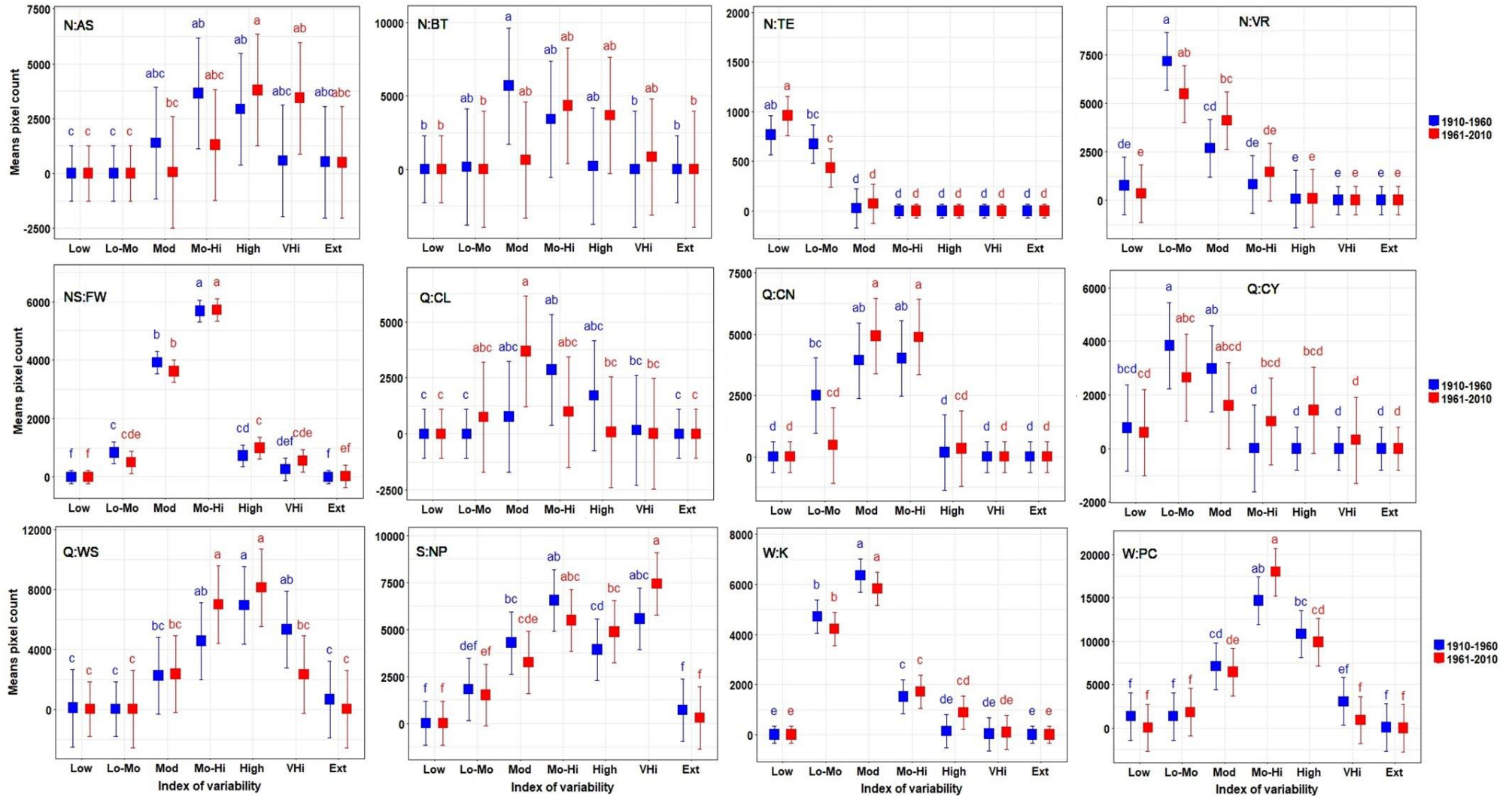
VIC Mallee (V:M)	Extreme (> 2)	0 (0)	0 (0)	0	
	Very High (1.5,2)	0 (0)	0 (0)	0	
	High (1.25,1.5)	0 (0)	0 (0)	0	
	Moderate to High (1,1.25)	0 (0)	0 (0)	0	
	Moderate (0.75,1)	289 (17.8)	171 (10.5)	-7	
	Low to Moderate (0.5,0.75)	1333 (82.2)	1447 (89.2)	7	
	Low (0,0.5)	0 (0)	4 (0.2)	0	
	VIC Wimmera (V:W)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		Moderate (0.75,1)	14 (1.2)	0 (0)	-1
		Low to Moderate (0.5,0.75)	851 (71.1)	975 (81.5)	10
		Low (0,0.5)	332 (27.7)	222 (18.5)	-9
	WA Central and Southern Wheat Belt (W:CS)	Extreme (> 2)	0 (0)	0 (0)	0
		Very High (1.5,2)	0 (0)	0 (0)	0
		High (1.25,1.5)	0 (0)	0 (0)	0
		Moderate to High (1,1.25)	0 (0)	0 (0)	0
		Moderate (0.75,1)	132 (2.2)	29 (0.5)	-2
		Low to Moderate (0.5,0.75)	4812 (79.1)	2912 (47.8)	-31
Low (0,0.5)		1143 (18.8)	3146 (51.7)	33	
WA Northern and Eastern Wheat Belt (W:NE)	Extreme (> 2)	0 (0)	0 (0)	0	
	Very High (1.5,2)	0 (0)	0 (0)	0	
	High (1.25,1.5)	0 (0)	0 (0)	0	
	Moderate to High (1,1.25)	20 (0.4)	82 (1.7)	1	
	Moderate (0.75,1)	1390 (28.8)	802 (16.6)	-12	
	Low to Moderate (0.5,0.75)	3346 (69.3)	3842 (79.6)	10	
	Low (0,0.5)	73 (1.5)	103 (2.1)	1	

**Table S2.** Proportions of land area (expressed as pixel counts and the corresponding percentage) in each class of the index of pasture growth variability for regions in the Australian Pastoral zone during the 1910-1960 and 1961-2010 periods. Differences in proportion  $\geq 10\%$  (absolute value) between the 2 periods are highlighted in red.

Agricultural region	Index of variability	Period		Difference between periods (%)
		1910-1960	1961-2010	
Northern Territory (NT) Alice Springs Districts (N:AS)	Extreme (> 2)	7485 (83.6)	8388 (93.6)	10
	Very High (1.5,2)	1235 (13.8)	274 (3.1)	-11
	High (1.25,1.5)	102 (1.1)	105 (1.2)	0
	Moderate to High (1,1.25)	77 (0.9)	138 (1.5)	1
	Moderate (0.75,1)	31 (0.3)	41 (0.5)	0
	Low to Moderate (0.5,0.75)	14 (0.2)	11 (0.1)	0
	Low (0,0.5)	14 (0.2)	1 (0)	0
NT Barkly Tablelands (N:BT)	Extreme (> 2)	4684 (49.7)	6475 (68.6)	19
	Very High (1.5,2)	2039 (21.6)	1090 (11.6)	-10
	High (1.25,1.5)	1007 (10.7)	621 (6.6)	-4
	Moderate to High (1,1.25)	716 (7.6)	490 (5.2)	-2
	Moderate (0.75,1)	488 (5.2)	308 (3.3)	-2
	Low to Moderate (0.5,0.75)	283 (3)	332 (3.5)	1
	Low (0,0.5)	217 (2.3)	117 (1.2)	-1
NT Top End Darwin (N:TE)	Extreme (> 2)	0 (0)	0 (0)	0
	Very High (1.5,2)	0 (0)	0 (0)	0
	High (1.25,1.5)	0 (0)	0 (0)	0
	Moderate to High (1,1.25)	0 (0)	0 (0)	0
	Moderate (0.75,1)	0 (0)	0 (0)	0
	Low to Moderate (0.5,0.75)	1 (0.1)	1 (0.1)	0
	Low (0,0.5)	1616 (99.9)	1616 (99.9)	0
NT Victoria River District – Katherine (N:VR)	Extreme (> 2)	136 (1.2)	194 (1.7)	1
	Very High (1.5,2)	279 (2.4)	252 (2.2)	0
	High (1.25,1.5)	249 (2.2)	238 (2.1)	0
	Moderate to High (1,1.25)	433 (3.7)	543 (4.7)	1
	Moderate (0.75,1)	911 (7.9)	945 (8.2)	0
	Low to Moderate (0.5,0.75)	2094 (18.1)	2093 (18.1)	0
	Low (0,0.5)	7466 (64.5)	7302 (63.1)	-1
New South Wales (NSW) Far West (NS:FW)	Extreme (> 2)	4629 (40.2)	4765 (41.4)	1
	Very High (1.5,2)	3988 (34.6)	3638 (31.6)	-3
	High (1.25,1.5)	1967 (17.1)	1486 (12.9)	-4
	Moderate to High (1,1.25)	858 (7.4)	1111 (9.6)	2
	Moderate (0.75,1)	69 (0.6)	470 (4.1)	3
	Low to Moderate (0.5,0.75)	8 (0.1)	44 (0.4)	0
	Low (0,0.5)	(0)	5 (0)	0
Queensland (QLD) Charleville – Longreach (Q:CL)	Extreme (> 2)	2009 (36.5)	1911 (34.7)	-2
	Very High (1.5,2)	1354 (24.6)	1498 (27.2)	3
	High (1.25,1.5)	1242 (22.5)	1050 (19.1)	-3
	Moderate to High (1,1.25)	717 (13)	695 (12.6)	0
	Moderate (0.75,1)	122 (2.2)	292 (5.3)	3
	Low to Moderate (0.5,0.75)	42 (0.8)	36 (0.7)	0
	Low (0,0.5)	23 (0.4)	27 (0.5)	0
QLD Central North	Extreme (> 2)	1609 (15.1)	1925 (18.1)	3

(Q:CN)	Very High (1.5,2)	1526 (14.4)	1764 (16.6)	2
	High (1.25,1.5)	1346 (12.7)	1468 (13.8)	1
	Moderate to High (1,1.25)	1569 (14.8)	1402 (13.2)	-2
	Moderate (0.75,1)	1219 (11.5)	1098 (10.3)	-1
	Low to Moderate (0.5,0.75)	1455 (13.7)	1513 (14.2)	1
	Low (0,0.5)	1901 (17.9)	1454 (13.7)	-4
QLD Cape York and the Gulf (Q:CY)	Extreme (> 2)	48 (0.6)	365 (4.8)	4
	Very High (1.5,2)	241 (3.2)	337 (4.4)	1
	High (1.25,1.5)	267 (3.5)	244 (3.2)	0
	Moderate to High (1,1.25)	421 (5.5)	329 (4.3)	-1
	Moderate (0.75,1)	443 (5.8)	427 (5.6)	0
	Low to Moderate (0.5,0.75)	1035 (13.5)	1322 (17.3)	4
QLD West and South West (Q:WS)	Low (0,0.5)	5187 (67.9)	4619 (60.4)	-7
	Extreme (> 2)	16430 (83)	16020 (80.9)	-2
	Very High (1.5,2)	2299 (11.6)	2740 (13.8)	2
	High (1.25,1.5)	662 (3.3)	754 (3.8)	0
	Moderate to High (1,1.25)	281 (1.4)	156 (0.8)	-1
	Moderate (0.75,1)	129 (0.7)	128 (0.6)	0
South Australia (SA) Northern Pastoral (S:NP)	Low to Moderate (0.5,0.75)	3 (0)	6 (0)	0
	Low (0,0.5)	1 (0)	1 (0)	0
	Extreme (> 2)	21549 (94.3)	20626 (90.2)	-4
	Very High (1.5,2)	610 (2.7)	881 (3.9)	1
	High (1.25,1.5)	231 (1)	501 (2.2)	1
	Moderate to High (1,1.25)	185 (0.8)	384 (1.7)	1
Western Australia (WA) The Kimberley (W:K)	Moderate (0.75,1)	179 (0.8)	285 (1.2)	0
	Low to Moderate (0.5,0.75)	59 (0.3)	130 (0.6)	0
	Low (0,0.5)	44 (0.2)	53 (0.2)	0
	Extreme (> 2)	1092 (8.5)	1112 (8.7)	0
	Very High (1.5,2)	514 (4)	1119 (8.7)	5
	High (1.25,1.5)	672 (5.2)	1054 (8.2)	3
WA Pilbara and Central Pastoral (W:PC)	Moderate to High (1,1.25)	1125 (8.8)	947 (7.4)	-1
	Moderate (0.75,1)	2017 (15.7)	1327 (10.4)	-5
	Low to Moderate (0.5,0.75)	2051 (16)	2125 (16.6)	1
	Low (0,0.5)	5341 (41.7)	5127 (40)	-2
	Extreme (> 2)	28867 (77.6)	24133 (64.9)	-13
	Very High (1.5,2)	4593 (12.3)	7791 (20.9)	9
WA Pilbara and Central Pastoral (W:PC)	High (1.25,1.5)	1555 (4.2)	2812 (7.6)	3
	Moderate to High (1,1.25)	1157 (3.1)	1583 (4.3)	1
	Moderate (0.75,1)	646 (1.7)	621 (1.7)	0
	Low to Moderate (0.5,0.75)	283 (0.8)	203 (0.5)	0
Low (0,0.5)	108 (0.3)	66 (0.2)	0	





**Fig. S1.** Comparisons of the proportions of land area in each class of rainfall variability for the agricultural regions in Australian Pastoral zone during 1910-1960 and 1961-2010. The proportion of land area is expressed in pixel count ( $0.05^\circ \times 0.05^\circ$ , approximately  $5 \text{ km}^2$  at the equator).

Boxes indicate the least square (LS) means from the ANOVA. Error bars indicate the 95% confidence interval of the LS mean. Means sharing similar letter(s) are not significantly different (significance level  $\alpha = 0.05$ ). Classes of rainfall variability: Low (*Low*), Low to moderate (*Lo-Mo*), Moderate (*Mod*), Moderate to high (*Mo-Hi*), High (*High*), Very high (*VHi*), and Extreme (*Ext*). Please refer to Table 1 for the abbreviations of the regions names.

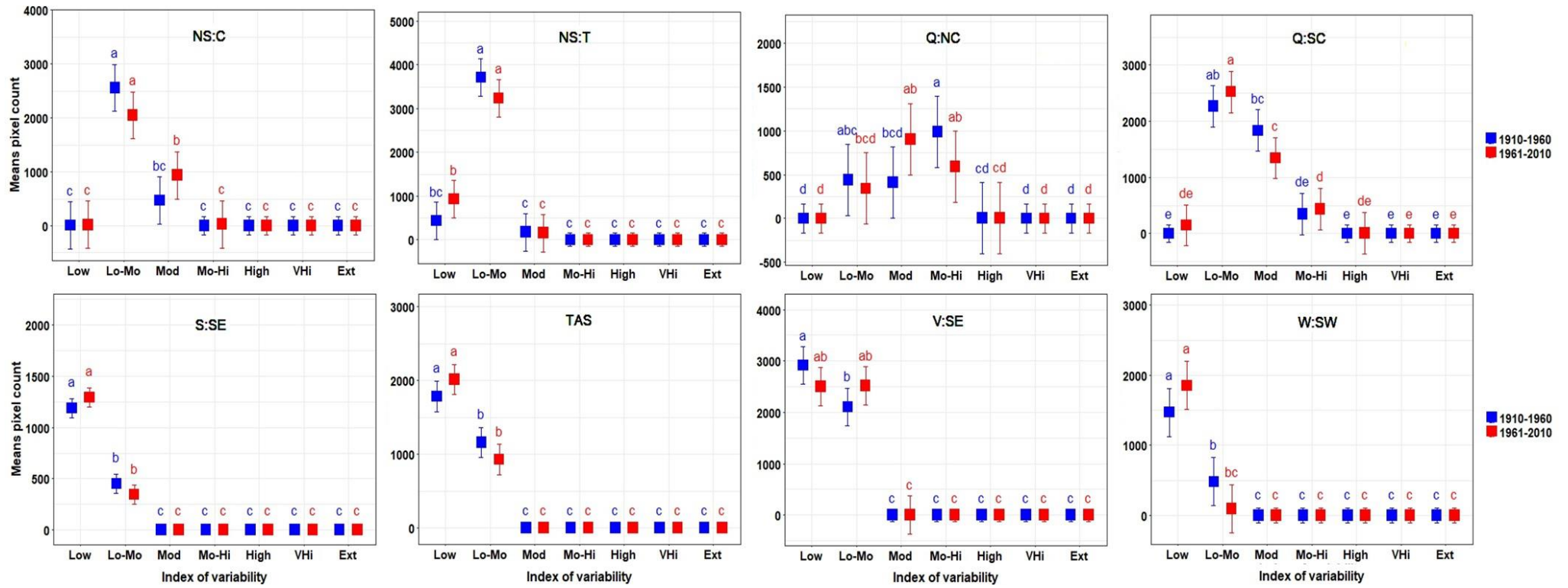


Fig. S2. Same as Fig. S1, but for the agricultural regions in High Rainfall zone.

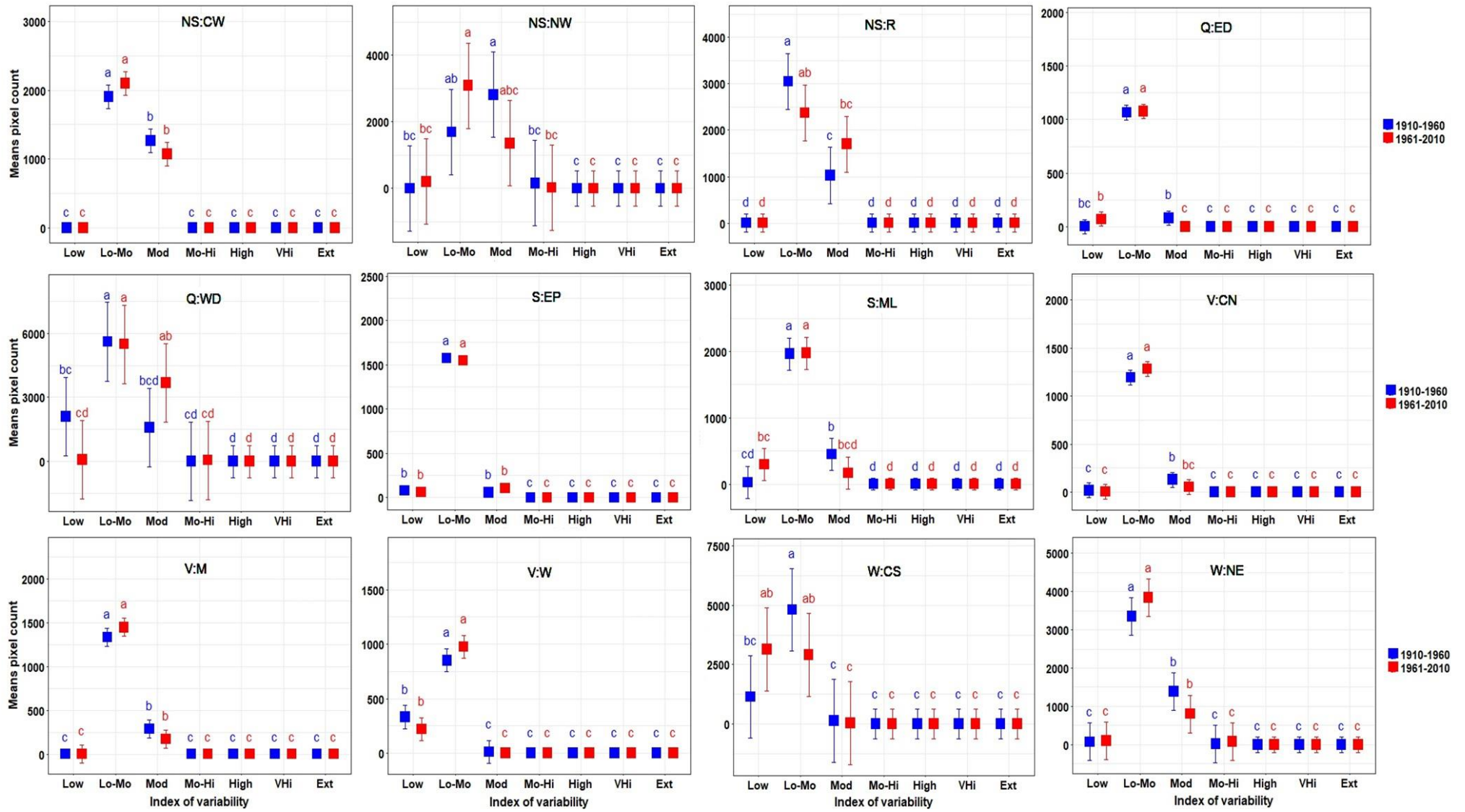
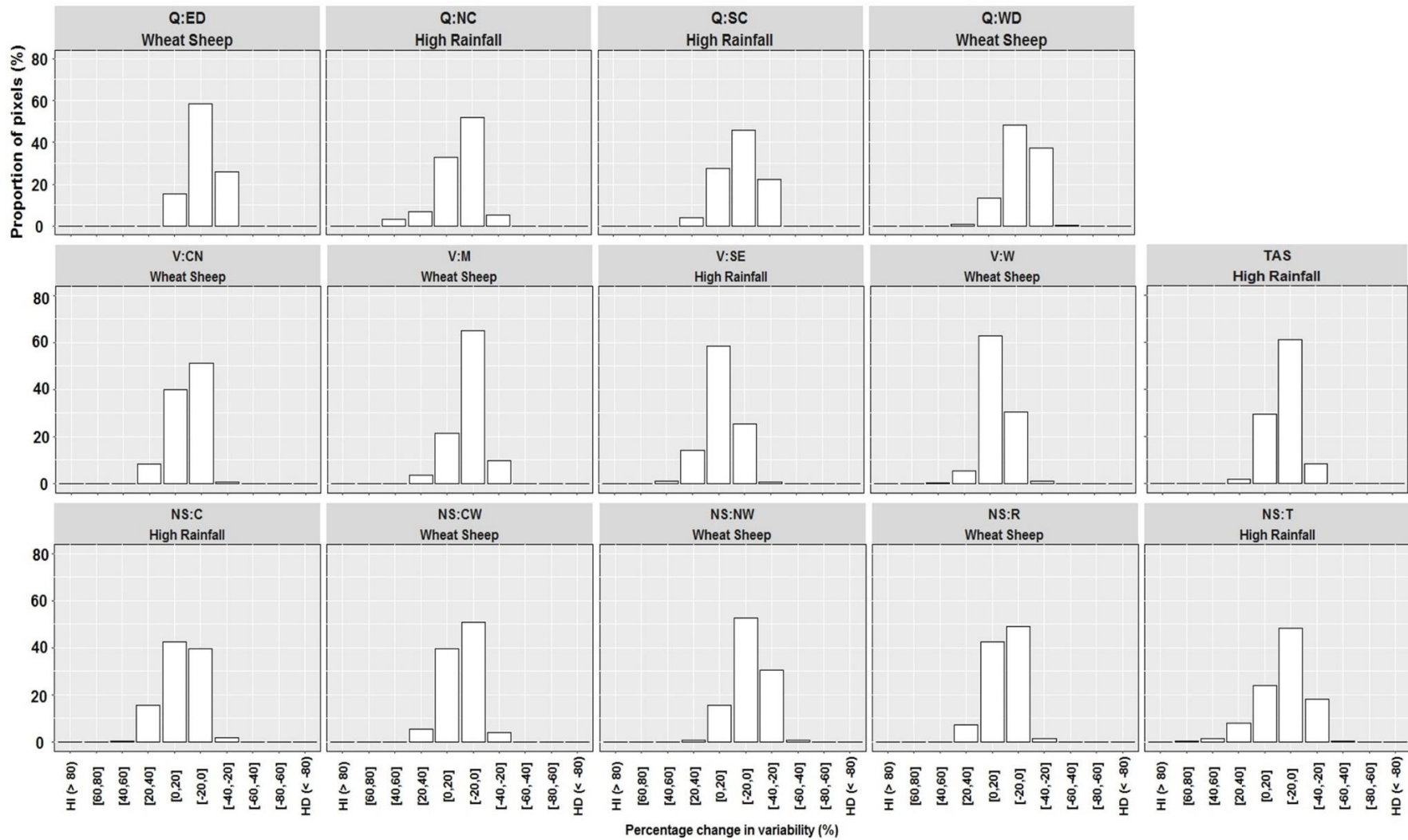


Fig. S3. Same as Fig. S1, but for the agricultural regions in Wheat Sheep zone.



**Fig. S4.** Proportion of land area for each interval of percentage change in rainfall variability between 1910-1960 and 1961-2010 across the agricultural regions in Australian High Rainfall and Wheat-Sheep zones. Please refer to Fig. 1 for the abbreviations of the regions names.

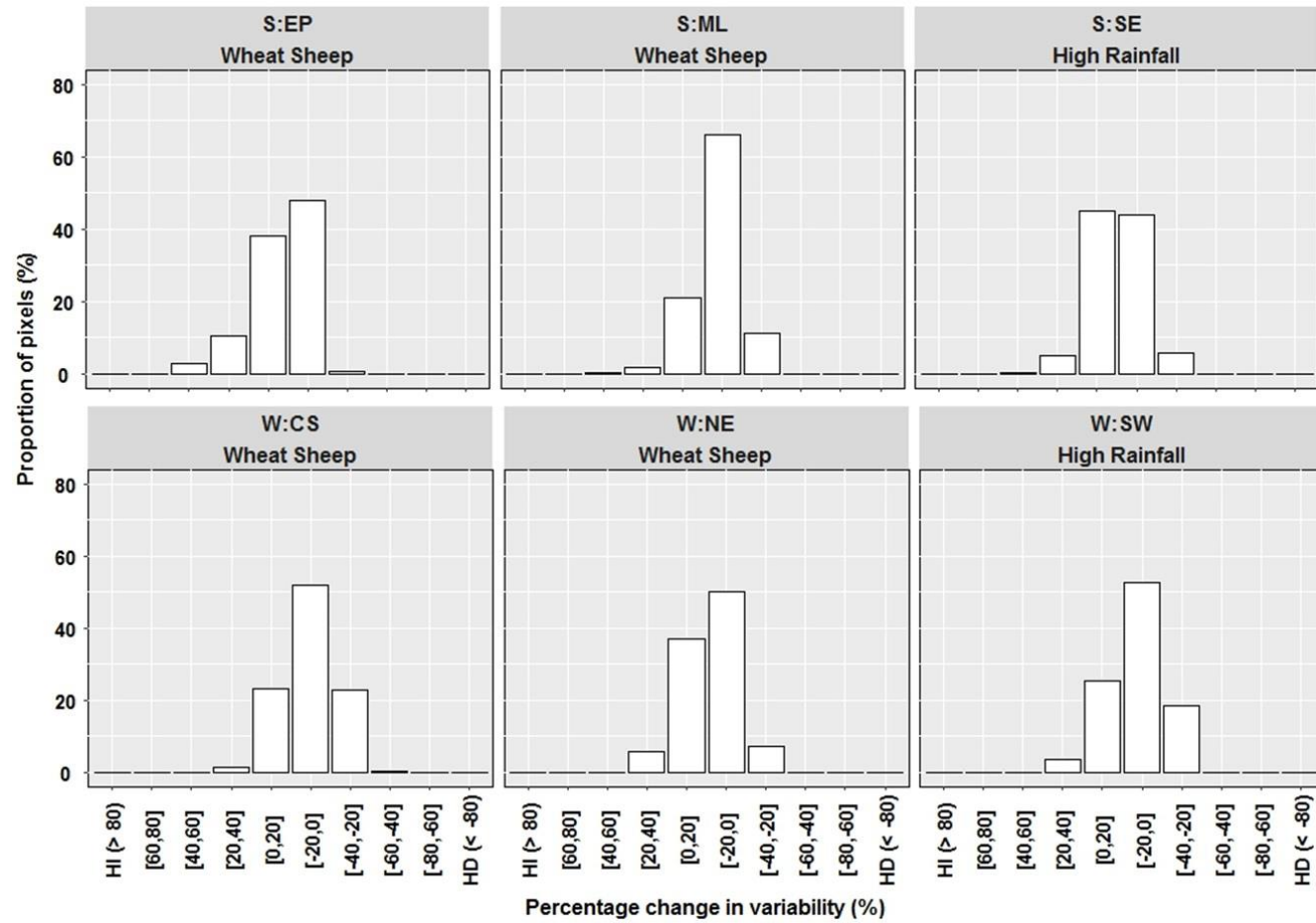
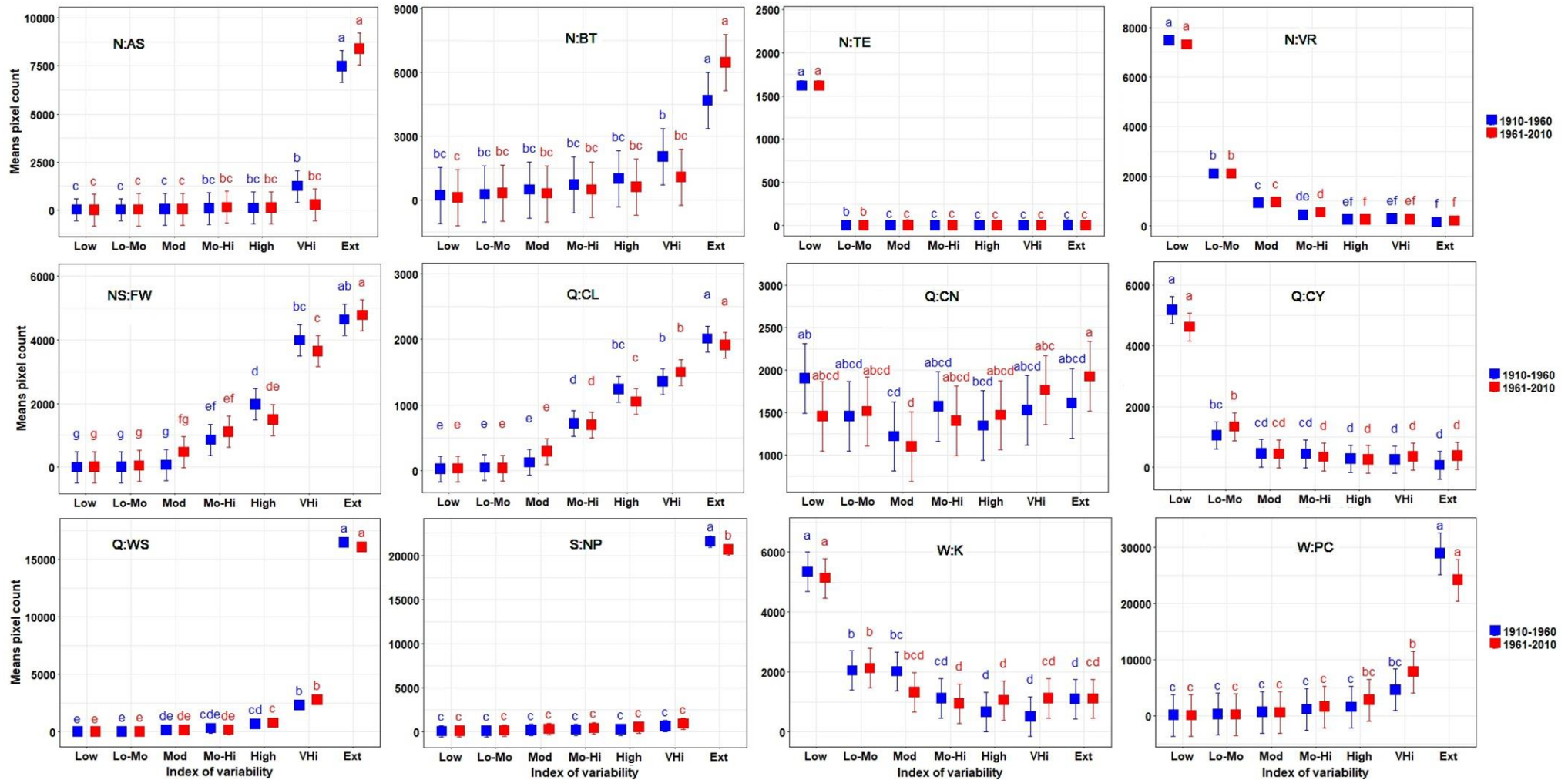


Fig. S4. (continued)



**Fig. S5.** Comparisons of the proportions of land area in each class of pasture growth variability for the agricultural regions in Australian Pastoral zone during 1910-1960 and 1961-2010. The proportion of land area is expressed in pixel count ( $0.05^\circ \times 0.05^\circ$ , approximately  $5 \text{ km}^2$  at the equator).

Boxes indicate the least square (LS) means from the ANOVA. Error bars indicate the 95% confidence interval of the LS mean. Means sharing similar letter(s) are not significantly different (significance level  $\alpha = 0.05$ ). Classes of pasture growth variability: Low (*Low*), Low to moderate (*Lo-Mo*), Moderate (*Mod*), Moderate to high (*Mo-Hi*), High (*High*), Very high (*VHi*), and Extreme (*Ext*). Please refer to Table 1 for the abbreviations of the regions names.