1 Objective Identification and Characterisation of Pacific ITCZs using ERA5, GPCP and TRMM: Supplemental Document

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1.1 Long-Term trends in ITCZs Characteristics

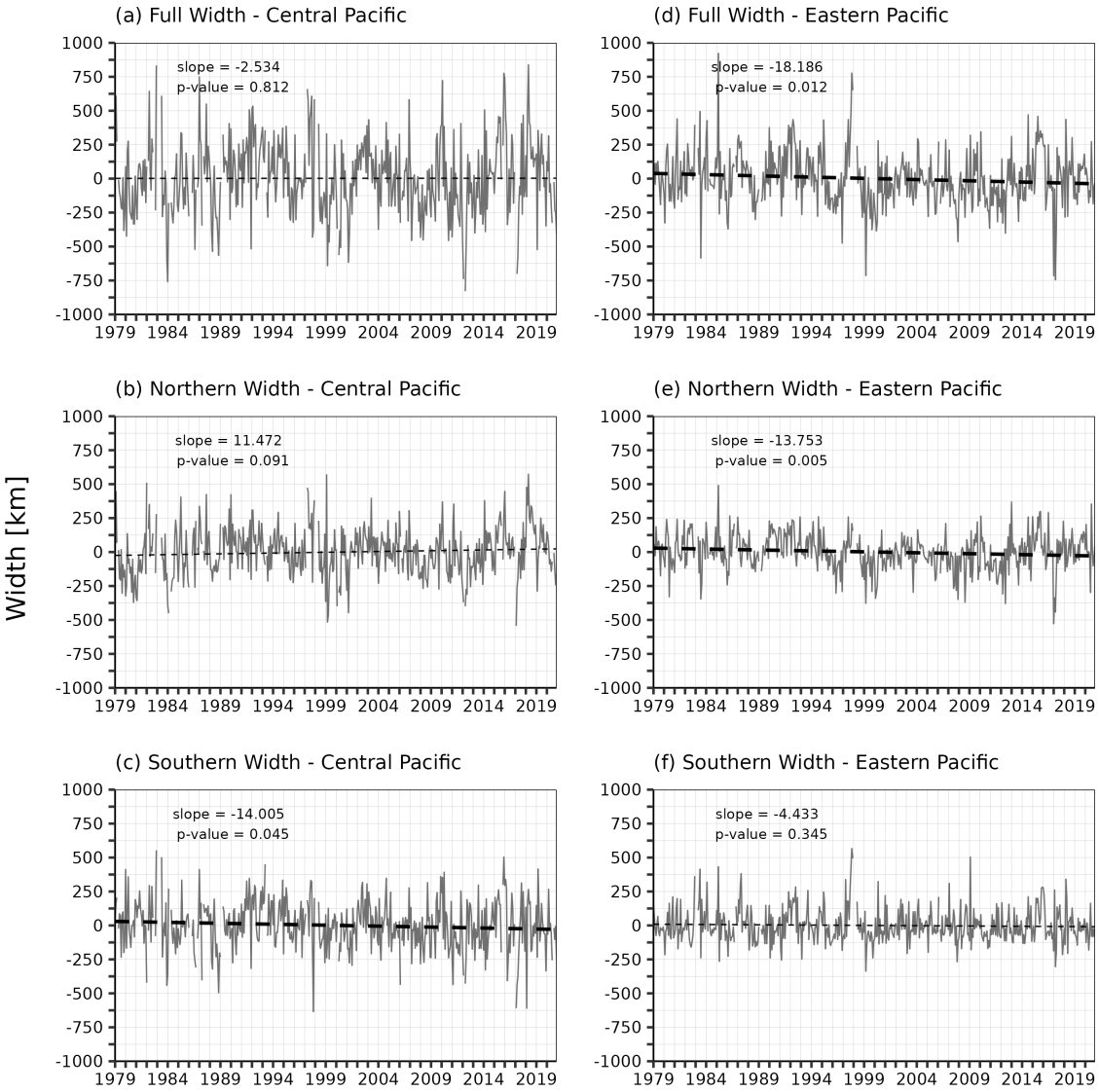

Figure S1: Time series of the monthly widths anomalies for the NH ITCZs (grey line) and trend line (dashed black line); (a) - (c) for the CP; (d) - (f) for the EP. Note: bold dashed black line indicates the significance of the trend.

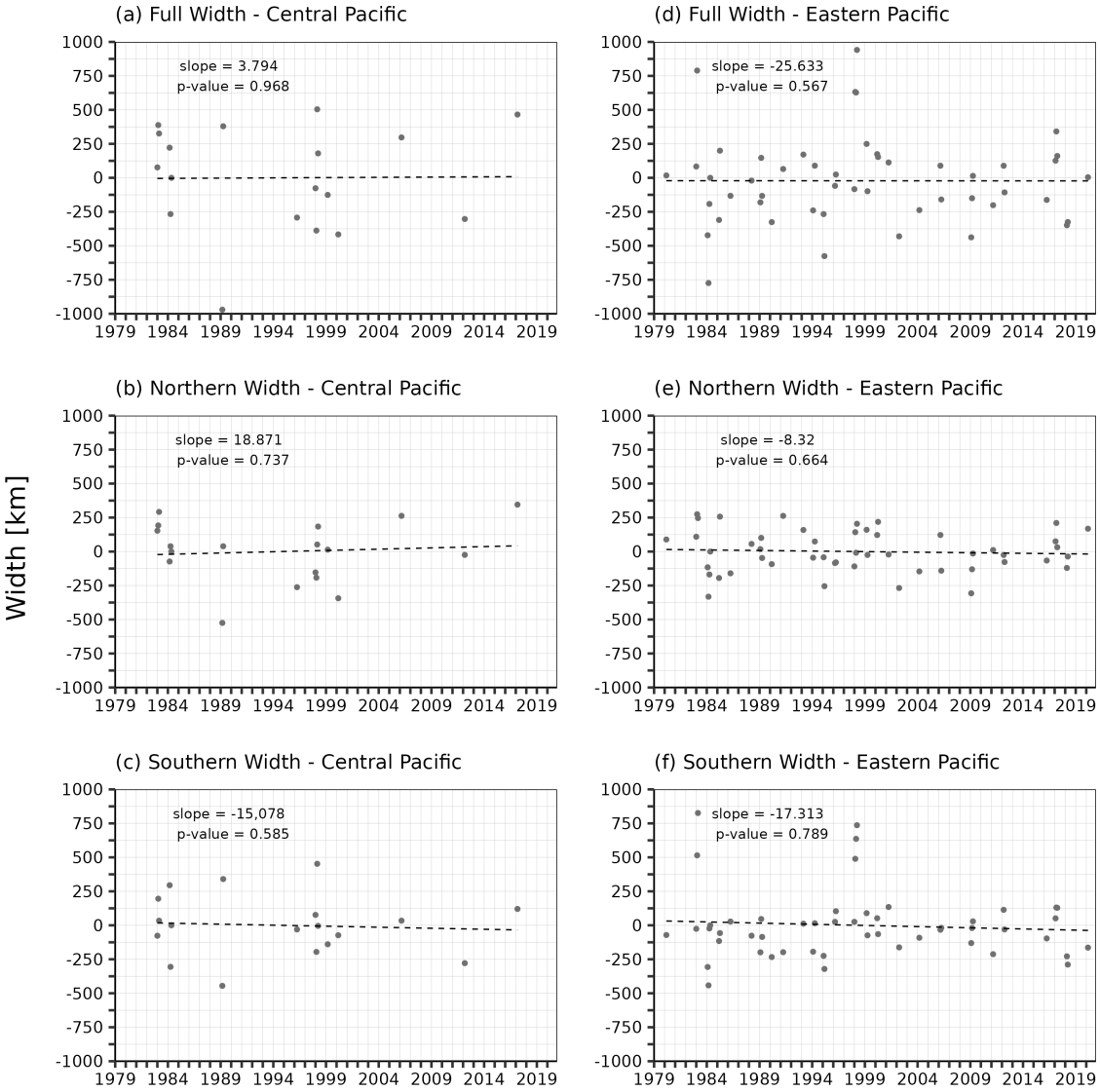

Figure S2: Time series of the monthly widths anomalies for the SH ITCZs (grey points) and trend line (dashed black line); (a) - (c) for the CP; (d) - (f) for the EP. Note: bold dashed black line indicates the significance of the trend.

Table S1: Slopes and p-values for monthly mean anomalies of ITCZs features in the CP and the EP.

		N-SITCZ & N-DITCZ i.e. NH ITCZs		S-SITCZ & S-DITCZ i.e. SH ITCZs	
		CP	EP	CP	EP
Centre Latitude	slope (b)	-0.199	0.064	-0.348	-0.138
	p-value	0.001	0.094	0.314	0.520
Northern Latitude	slope (b)	-0.095	-0.06	-0.178	-0.212
	p-value	0.214	0.248	0.802	0.469
Southern Latitude	slope (b)	-0.073	0.104	-0.212	0.018
	p-value	0.437	0.063	0.691	0.939
Full Width	slope (b)	-2.534	-18.186	3.794	-25.633
	p-value	0.812	0.012	0.968	0.564
Northern Width	slope (b)	11.472	-13.753	18.871	-8.32
	p-value	0.091	0.005	0.737	0.664
Southern Width	slope (b)	-14.006	-4.433	-15.078	-17.313
	p-value	0.045	0.345	0.585	0.789
Centre Precipitation	slope (b)	0.419	0.303	-0.238	0.25
	p-value	1.6E-05	6.63E-07	0.701	0.449
Full Precipitation	slope (b)	-0.017	-0.014	0.04	0.025
	p-value	0.493	0.591	0.874	0.846

Slope units are in degree decade^{-1} for latitudes, km decade^{-1} for widths, and mm day^{-1} decade^{-1} for precipitation intensity.

1.2 Seasonal Trends in ITCZs Characteristics

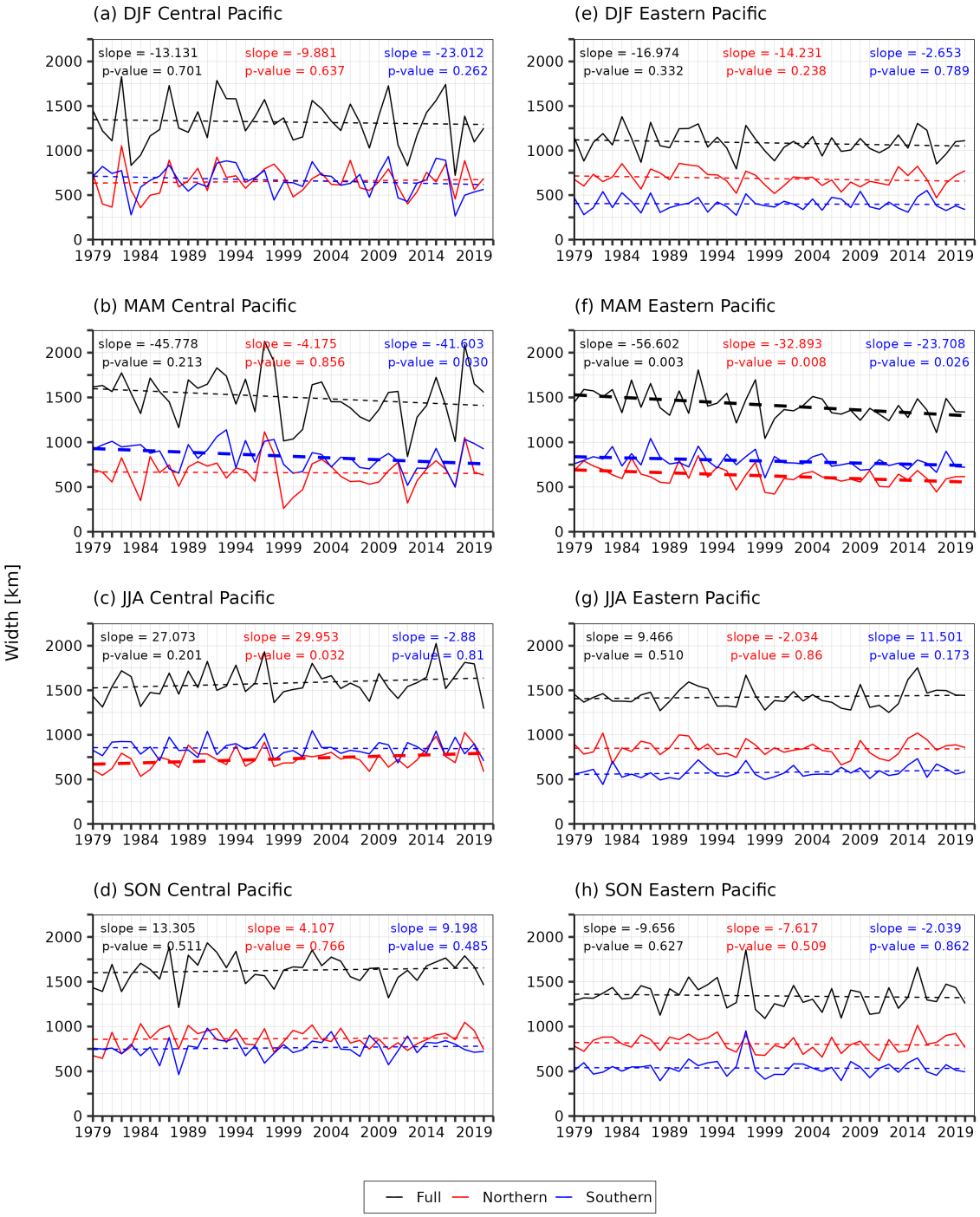

Figure S3: Time series of seasonal widths for the NH ITCZs (solid lines) and trends (dashed lines); (a) - (d) for the CP; (e) - (h) for the EP. Note: bold dashed black line indicates the significance of the trend.

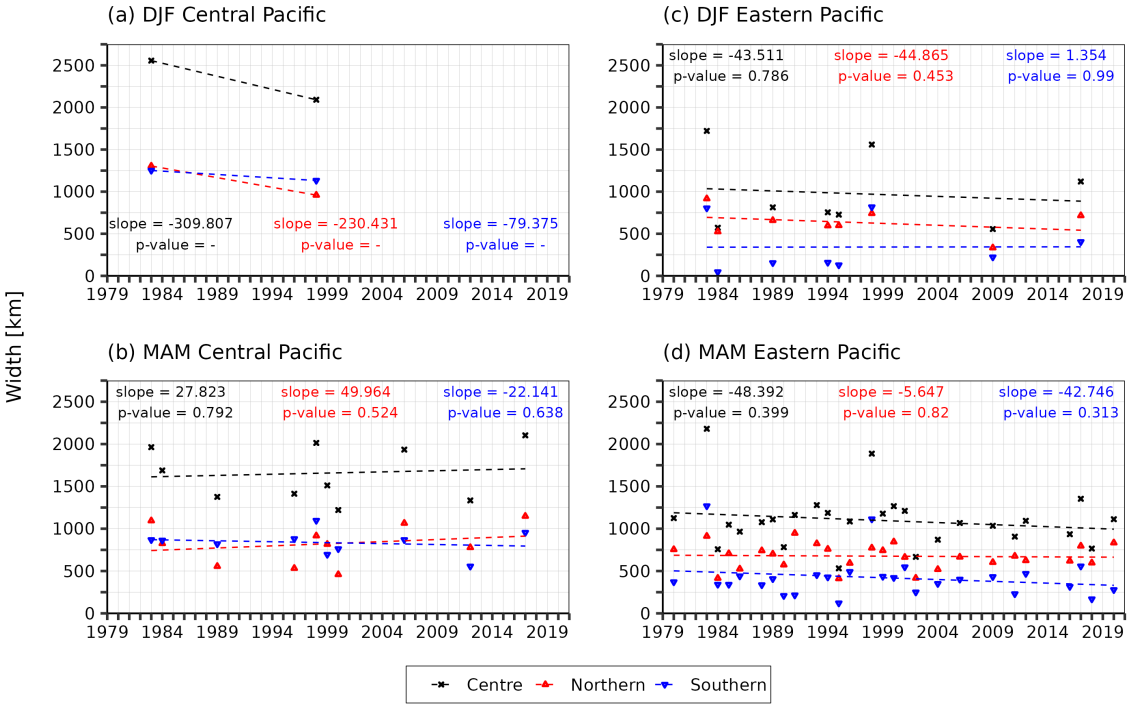

Figure S4: Time series of seasonal widths for the SH ITCZs (points) and trends (dashed lines); (a) and (b) for the CP; (c) and (d) for the EP. Note: bold dashed black line indicates the significance of the trend.

Table S2: Trends and Significance Values for Seasonal ITCZs Latitudes or Extends

			N-SITCZ and N-DITCZ i.e. NH ITCZs		S-SITCZ and S-DITCZ i.e. SH ITCZs	
			CP	EP	CP	EP
Centre Latitude	DJF	slope (b)	-0.152	-0.134	-1.114	-0.11
		p-value	0.357	0.105	-	0.911
	MAM	slope (b)	-0.327	0.089	-0.459	-0.213
		p-value	0.167	0.379	0.445	0.422
	JJA	slope (b)	-0.217	0.138	-	-
		p-value	0.047	0.183	-	-
	SON	slope (b)	-0.074	0.135	-	-
		p-value	0.607	0.175	-	-
Northern Latitude	DJF	slope (b)	-0.063	-0.263	-3.186	-0.514
		p-value	0.735	0.083	-	0.692
	MAM	slope (b)	-0.365	-0.206	-0.01	-0.263
		p-value	0.268	0.163	0.992	0.499
	JJA	slope (b)	0.052	0.12	-	-
		p-value	0.734	0.263	-	-
	SON	slope (b)	-0.037	0.066	-	-
		p-value	0.842	0.514	-	-
Southern Latitude	DJF	slope (b)	0.055	-0.111	-0.4	-0.123
		p-value	0.861	0.401	-	0.864
	MAM	slope (b)	0.047	0.303	-0.26	0.172
		p-value	0.872	0.073	0.725	0.544
	JJA	slope (b)	-0.191	0.035	-	-
		p-value	0.273	0.806	-	-
	SON	slope (b)	-0.156	0.153	-	-
		p-value	0.406	0.355	-	-

Slope units are in degree decade^{-1} for latitudes, km decade^{-1} for widths, and mm day^{-1} decade^{-1} for precipitation intensity.

Table S3: Trends and Significance Values for Seasonal ITCZs Widths

			N-SITCZ and N-DITCZ i.e. NH ITCZs		S-SITCZ and S-DITCZ i.e. SH ITCZs	
			CP	EP	CP	EP
Full width	DJF	slope (b)	-13.131	-16.974	-309.807	-43.511
		p-value	0.701	0.332	-	0.786
	MAM	slope (b)	-45.778	-56.602	27.823	-48.392
		p-value	0.213	0.003	0.792	0.399
	JJA	slope (b)	27.073	9.466	-	-
		p-value	0.201	0.51	-	-
	SON	slope (b)	13.305	-9.656	-	-
		p-value	0.511	0.627	-	-
Northern width	DJF	slope (b)	9.881	-14.321	-230.431	-44.865
		p-value	0.637	0.238	-	0.453
	MAM	slope (b)	-4.175	-32.893	49.964	-5.647
		p-value	0.856	0.008	0.524	0.82
	JJA	slope (b)	29.953	-2.034	-	-
		p-value	0.032	0.86	-	-
	SON	slope (b)	4.107	-7.617	-	-
		p-value	0.766	0.509	-	-
Southern width	DJF	slope (b)	-23.012	-2.653	-79.375	1.354
		p-value	0.262	0.789	-	0.99
	MAM	slope (b)	-41.603	-23.708	-22.141	-42.746
		p-value	0.03	0.026	0.638	0.313
	JJA	slope (b)	-2.88	11.501	-	-
		p-value	0.81	0.173	-	-
	SON	slope (b)	9.198	-2.039	-	-
		p-value	0.485	0.862	-	-

Slope units are in degree decade^{-1} for latitudes, km decade^{-1} for widths, and mm day^{-1} decade^{-1} for precipitation intensity.

Table S4: Trends and Significance Values for Seasonal ITCZs Precipitation Intensity

			N-SITCZ and N-DITCZ i.e. NH ITCZs		S-SITCZ and S-DITCZ i.e. SH ITCZs	
			CP	EP	CP	EP
Centre	DJF	slope (b)	0.668	0.268	0.43	0.011
Precipitation		p-value	0.045	0.115	-	0.994
	MAM	slope (b)	0.046	0.347	-0.308	0.241
		p-value	0.892	0.039	0.704	0.504
	JJA	slope (b)	0.353	0.323	-	-
		p-value	0.063	0.004	-	-
	SON	slope (b)	0.55	0.172	-	-
		p-value	0	0.206	-	-
Full	DJF	slope (b)	0.005	0.025	1.121	-0.461
Precipitation		p-value	0.949	0.725	-	0.5
	MAM	slope (b)	-0.02	-0.054	-0.369	0.105
		p-value	0.773	0.478	0.258	0.446
	JJA	slope (b)	-0.03	0.008	-	-
		p-value	0.612	0.888	-	-
	SON	slope (b)	-0.041	-0.068	-	-
		p-value	0.579	0.423	-	-

Slope units are in degree decade^{-1} for latitudes, km decade^{-1} for widths, and mm day^{-1} decade^{-1} for precipitation intensity.