

Table S1. Monthly diagnostics of aerosol layer top (ALT) and thermodynamic PBL height relationships at Chiang Mai and Songkhla from June 2021 to May 2022. Correlation coefficient (r) indicates similarity in temporal patterns, RMS difference and bias quantify vertical separation, and lag represents the timing offset between ALT and PBL evolution. The corresponding season of each month is also indicated.

Month	Season	Chiang Mai				Songkhla			
		r	RMS (km)	Bias (km)	Lag (h)	r	RMS (km)	Bias (km)	Lag (h)
Jun 2021	Rainy	0.79	1.28	1.25	1.0	0.98	0.33	0.31	0.0
Jul 2021	Rainy	0.89	1.03	0.98	0.0	0.94	0.38	0.37	0.5
Aug 2021	Rainy	0.90	1.06	1.00	0.5	0.97	0.38	0.37	0.0
Sep 2021	Rainy	0.91	0.85	0.83	0.0	0.87	0.40	0.37	0.5
Oct 2021	Rainy	0.90	0.91	0.90	0.0	0.74	0.35	0.34	1.5
Nov 2021	Cool Dry	0.97	0.15	0.14	0.0	0.75	0.36	0.35	-1.5
Dec 2021	Cool Dry	0.92	0.37	0.36	0.5	0.80	0.37	0.36	-0.5
Jan 2022	Cool Dry	0.85	0.34	0.33	0.0	N/A*	0.21	0.20	N/A*
Feb 2022	Warm Dry	0.68	0.74	0.68	2.0	0.67	0.33	0.32	-0.5
Mar 2022	Warm Dry	0.93	1.01	0.87	0.5	0.75	0.26	0.26	-0.5
Apr 2022	Warm Dry	0.65	0.53	0.52	-1.0	N/A*	0.33	0.33	N/A*
May 2022	Warm Dry	0.78	0.95	0.89	1.0	0.85	0.44	0.42	1.5

* Correlation and lag diagnostics are reported as N/A for Songkhla in January and April due to weak diurnal variability in both ALT and PBL height, rendering correlation- and lag-based metrics physically ambiguous due to suppressed diurnal variability.

Table S2. Monthly correlations between aerosol layer top (ALT), thermodynamic PBL height, surface temperature, and near-surface wind speed at Chiang Mai and Songkhla. Bias refers to mean $\Delta(ALT-PBL)$.

Month	Temperature						Near-Surface Wind Speed			
	Chiang Mai			Songkhla			Chiang Mai		Songkhla	
	r(ALT)	r(PBL)	Bias (km)	r(ALT)	r(PBL)	Bias (km)	r(ALT)	r(PBL)	r(ALT)	r(PBL)
Jun 2021	0.497	0.679	1.65	0.355	0.601	0.74	0.346	0.268	0.280	0.323
Jul 2021	0.459	0.719	1.36	0.042	0.653	0.81	0.360	0.177	0.158	0.389
Aug 2021	0.543	0.727	1.39	0.284	0.726	0.80	0.353	0.281	0.287	0.417
Sep 2021	0.274	0.802	1.26	0.339	0.610	0.82	0.317	0.246	0.334	0.357
Oct 2021	0.228	0.765	1.29	0.115	0.634	0.80	0.271	0.097	0.151	0.383
Nov 2021	0.593	0.764	0.60	0.078	0.501	0.80	0.342	0.371	−0.014	0.256
Dec 2021	0.411	0.711	0.78	0.204	0.548	0.94	0.174	0.329	0.257	0.374
Jan 2022	0.237	0.425	0.61	−0.021	0.040	0.78	0.310	0.247	0.188	0.349
Feb 2022	0.362	0.250	0.97	−0.052	0.358	0.84	0.205	0.105	0.233	0.254
Mar 2022	0.639	0.325	1.16	−0.008	0.243	0.74	0.322	0.164	−0.029	0.096
Apr 2022	−0.056	0.356	0.88	−0.181	0.319	0.81	0.235	0.172	−0.211	0.129
May 2022	0.578	0.723	1.31	0.238	0.631	0.87	0.336	0.342	0.310	0.447