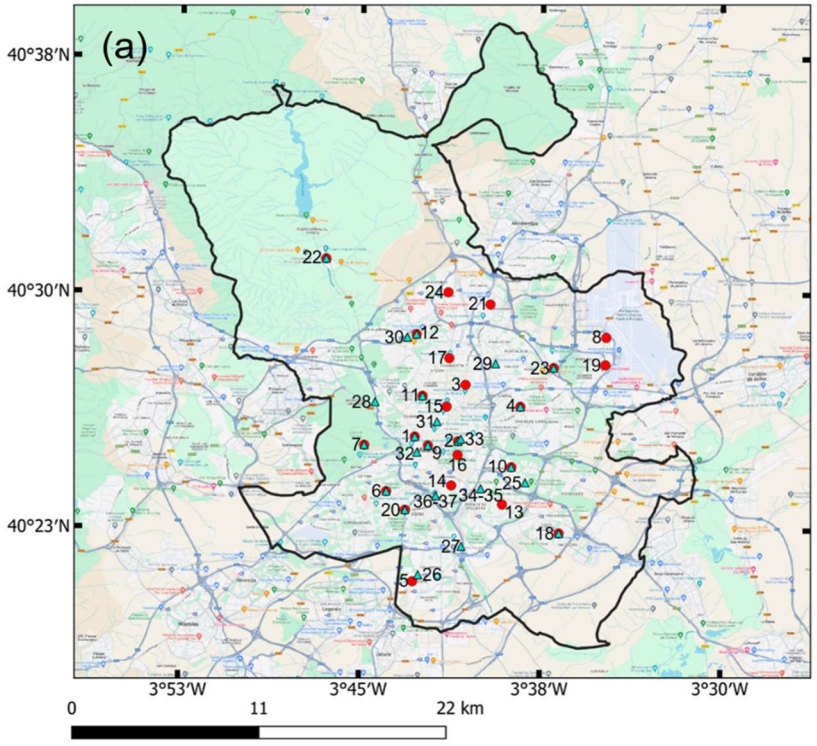
Supplementary material

Table S1. Air quality monitoring stations, meteorological stations, and data availability in each city under study. Station numbers correspond to those displayed in Figure S1.

City	Station			Parameter availability						
	Number	Name	Type	NO_2	O_3	WS	WD	T	RH	SR
Madrid	1	Plaza España	AQ+Meteo	Yes	No	No	No	Yes	No	No
	2	Escuelas Aguirre	AQ+Meteo	Yes	Yes	No	No	Yes	Yes	No
	3	Ramón y Cajal	AQ	Yes	No	No	No	No	No	No
	4	Arturo Soria	AQ+Meteo	Yes	Yes	No	No	Yes	Yes	No
	5	Villaverde	AQ	Yes	Yes	No	No	No	No	No
	6	Farolillo	AQ+Meteo	Yes	Yes	No	No	Yes	No	No
	7	Casa de Campo	AQ+Meteo	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	8	Barajas Pueblo	AQ	Yes	Yes	No	No	No	No	No
	9	Plaza del Carmen	AQ+Meteo	Yes	Yes	No	No	Yes	Yes	No
	10	Moratalaz	AQ+Meteo	Yes	No	No	No	Yes	Yes	No
	11	Cuatro Caminos	AQ+Meteo	Yes	No	No	No	Yes	Yes	No
	12	Barrio del Pilar	AQ+Meteo	Yes	Yes	No	No	Yes	Yes	No
	13	Vallecas	AQ	Yes	No	No	No	No	No	No
	14	Méndez Álvaro	AQ	Yes	No	No	No	No	No	No
	15	Castellana	AQ	Yes	No	No	No	No	No	No
	16	Retiro	AQ	Yes	Yes	No	No	No	No	No
	17	Plaza Castilla	AQ	Yes	No	No	No	No	No	No
	18	Ensanche de Vallecas	AQ+Meteo	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	19	Urbanización Embajada	AQ	Yes	No	No	No	No	No	No
	20	Plaza Elíptica	AQ+Meteo	Yes	No	Yes	Yes	Yes	Yes	No
	21	Sanchinarro	AQ	Yes	No	No	No	No	No	No
	22	El Pardo	AQ+Meteo	Yes	Yes	No	No	Yes	Yes	No
	23	Juan Carlos I	AQ+Meteo	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	24	Tres Olivos	AQ	Yes	Yes	No	No	No	No	No
	25	J.M.D. Moratalaz	Meteo	No	No	Yes	Yes	Yes	Yes	Yes
	26	J.M.D. Villaverde	Meteo	No	No	Yes	Yes	Yes	Yes	Yes
	27	E.D.A.R. La China	Meteo	No	No	Yes	Yes	No	No	No
	28	C.M. Acústica	Meteo	No	No	Yes	Yes	Yes	Yes	Yes
	29	J.M.D. Hortaleza	Meteo	No	No	Yes	Yes	Yes	Yes	Yes
	30	Peñagrande	Meteo	No	No	Yes	Yes	Yes	Yes	Yes
	31	J.M.D. Chamberí	Meteo	No	No	No	No	Yes	Yes	No
	32	J.M.D. Centro	Meteo	No	No	No	No	Yes	Yes	No
	33	J.M.D. Chamartín	Meteo	No	No	No	No	Yes	Yes	No
	34	J.M.D. Vallecas 1	Meteo	No	No	No	No	Yes	Yes	No
	35	J.M.D. Vallecas 2	Meteo	No	No	No	No	Yes	Yes	No
	36	Matadero 1	Meteo	No	No	No	No	Yes	Yes	No
	37	Matadero 2	Meteo	No	No	No	No	Yes	Yes	No
Barcelona	1	Poblenou	AQ	Yes	No	No	No	No	No	No
	2	Sants	AQ	Yes	No	No	No	No	No	No
	3	Eixample	AQ	Yes	Yes	No	No	No	No	No

	4	Palau Reial	AQ	Yes	Yes	No	No	No	No	No
	5	Gràcia-Sant Gervasi	AQ	Yes	Yes	No	No	No	No	No
	6	Ciutadella	AQ	Yes	Yes	No	No	No	No	No
	7	Parc Vall Hebron	AQ	Yes	Yes	No	No	No	No	No
	8	Observatori Fabra	AQ+Meteo	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	9	Zoo	Meteo	No	No	No	No	Yes	Yes	No
	10	El Raval	Meteo	No	No	Yes	Yes	Yes	Yes	Yes
	11	Zona Universitària	Meteo	No	No	Yes	Yes	Yes	Yes	Yes
Valencia	1	Avenida França	AQ+Meteo	Yes	Yes	Yes	Yes	No	No	No
	2	Bulevard Sud	AQ	Yes	Yes	No	No	No	No	No
	3	Centre	AQ	Yes	No	No	No	No	No	No
	4	Molí del Sol	AQ	Yes	Yes	No	No	No	No	No
	5	Nazaret Met-2	Meteo	No	No	Yes	Yes	Yes	Yes	Yes
	6	Pista de Silla	AQ	Yes	Yes	No	No	No	No	No
	7	Politècnic	AQ	Yes	Yes	No	No	No	No	No
	8	Vivers	AQ	Yes	Yes	No	No	No	No	No
	9	Olivereta	AQ	Yes	No	No	No	No	No	No
	10	Port llit antic Túria	AQ+Meteo	Yes	No	Yes	Yes	Yes	Yes	Yes
	11	Port Moll Trans. Ponent	AQ+Meteo	Yes	No	Yes	Yes	Yes	Yes	Yes
	12	Conselleria Meteo	Meteo	No	No	Yes	Yes	Yes	Yes	Yes



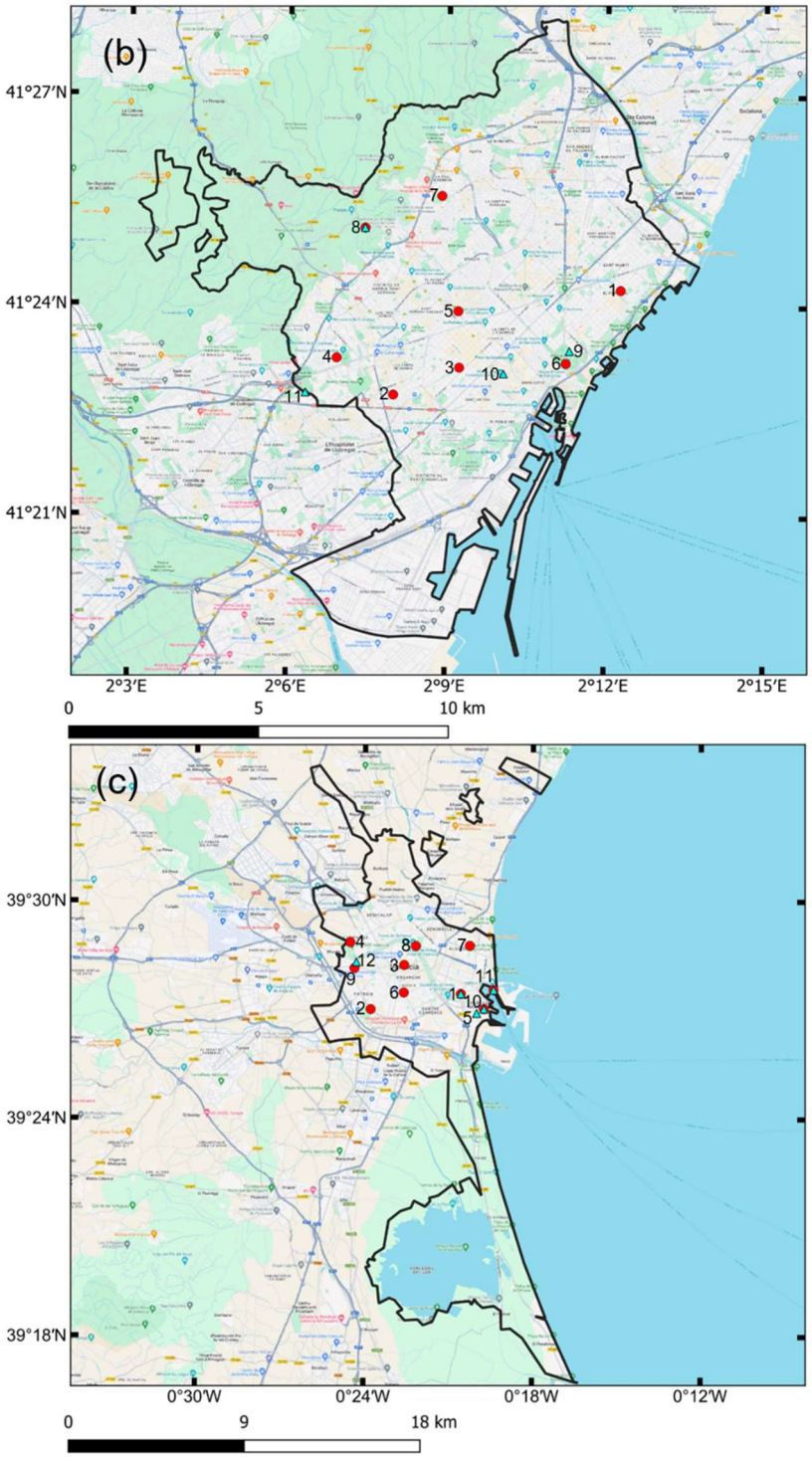


Figure S1. Geographical location of air quality monitoring stations (red circles) and meteorological stations (blue triangles) in the cities of (a) Madrid, (b) Barcelona, and (c) Valencia. Numbers correspond to those displayed in Table S1.

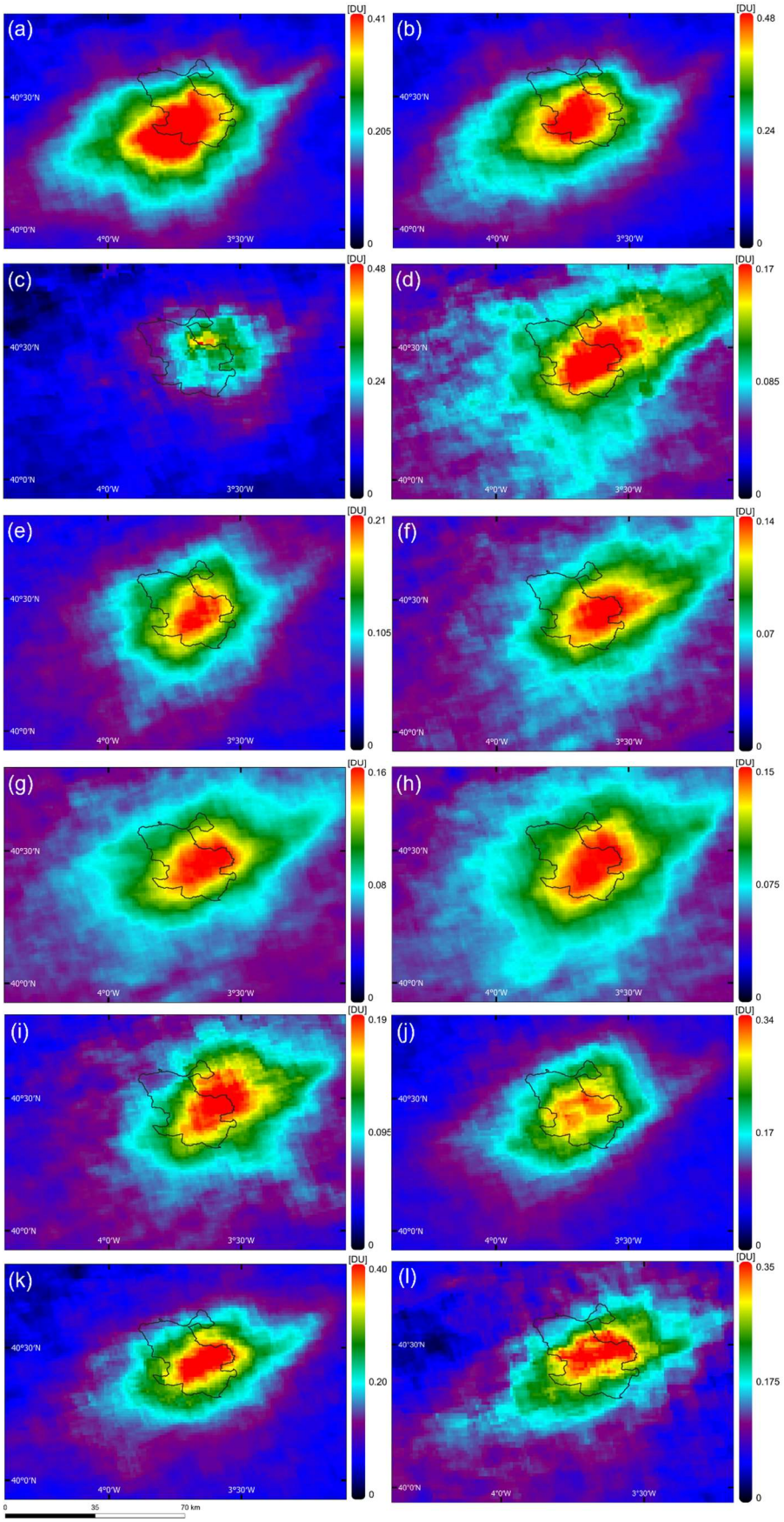


Figure S2. Monthly maps of mean tropospheric TROPOMI NO_2 column (DU) over Madrid and its surroundings in (a) January, (b) February, (c) March, (d) April, (e) May, (f) June, (g) July, (h) August, (i) September, (j) October, (k) November and (l) December of 2022. Black lines represent the city limits.

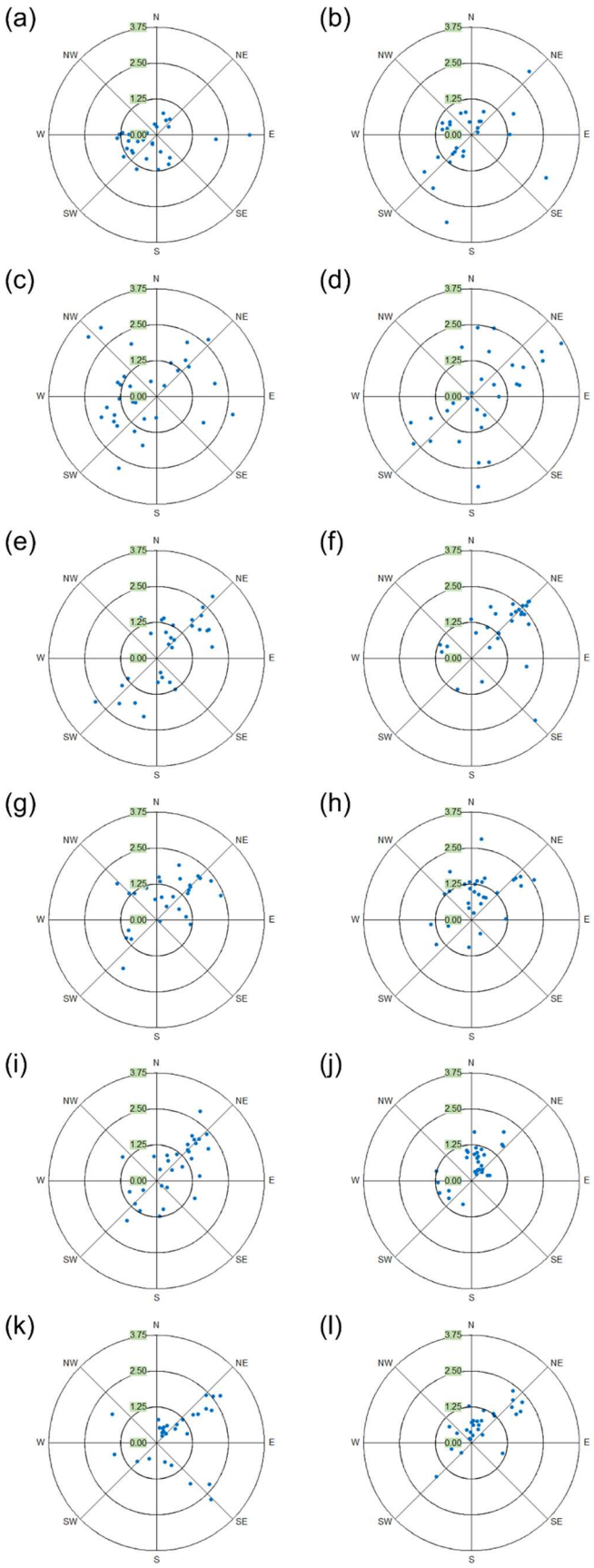


Figure S3. Monthly distribution of wind distribution in Madrid in 2022: January (a), February (b), March (c), April (d), May (e), June (f), July (g), August (h), September (i), October (j), November (k), December (l). Blue dots represent average wind speed and direction in a day between Sentinel-5P overpass times.

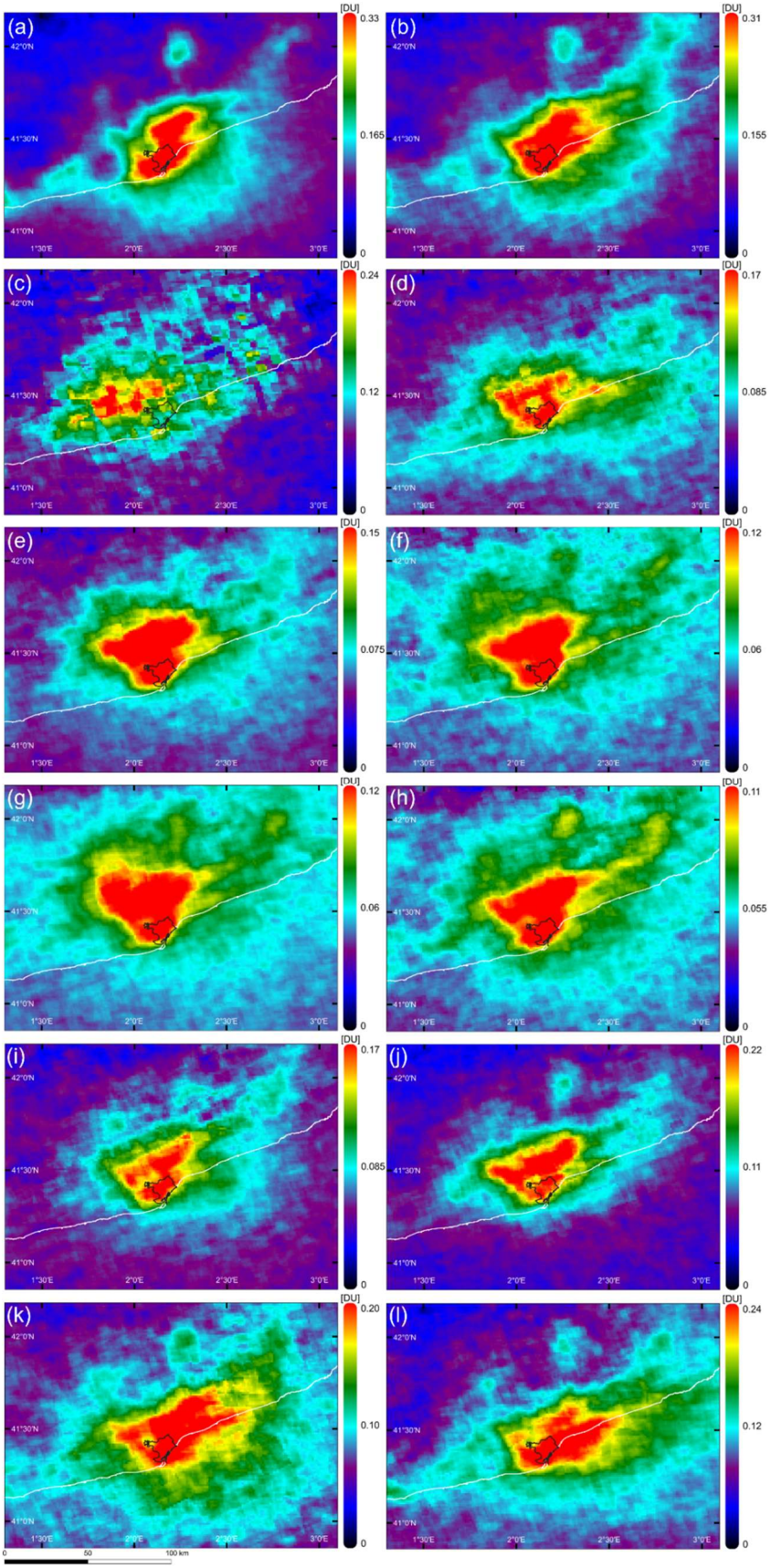


Figure S4. Monthly maps of mean tropospheric TROPOMI NO_2 column (DU) over Barcelona and its surroundings in (a) January, (b) February, (c) March, (d) April, (e) May, (f) June, (g) July, (h) August, (i) September, (j) October, (k) November and (l) December of 2022. Black lines represent the city limits. White lines represent the coastline.

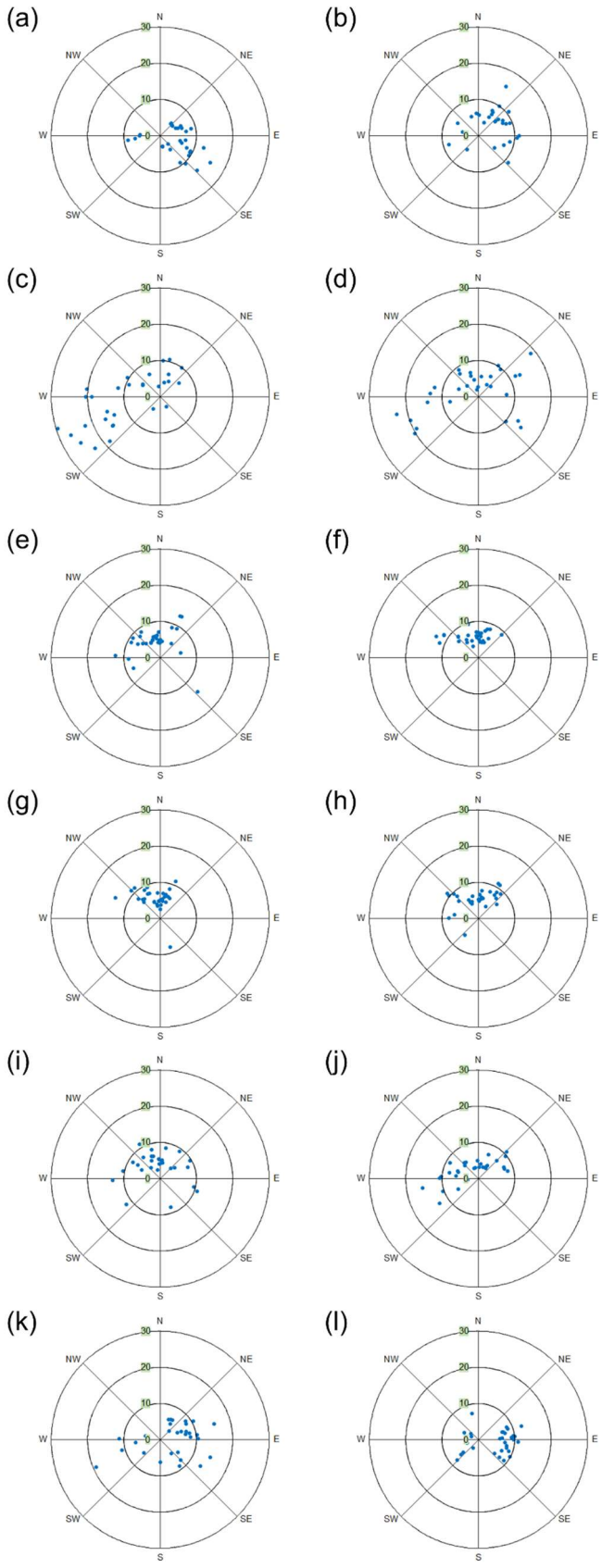


Figure S5. Monthly distribution of wind distribution in Barcelona in 2022: January (a), February (b), March (c), April (d), May (e), June (f), July (g), August (h), September (i), October (j), November (k), December (l). Blue dots represent average wind speed and direction in a day between Sentinel-5P overpass times.

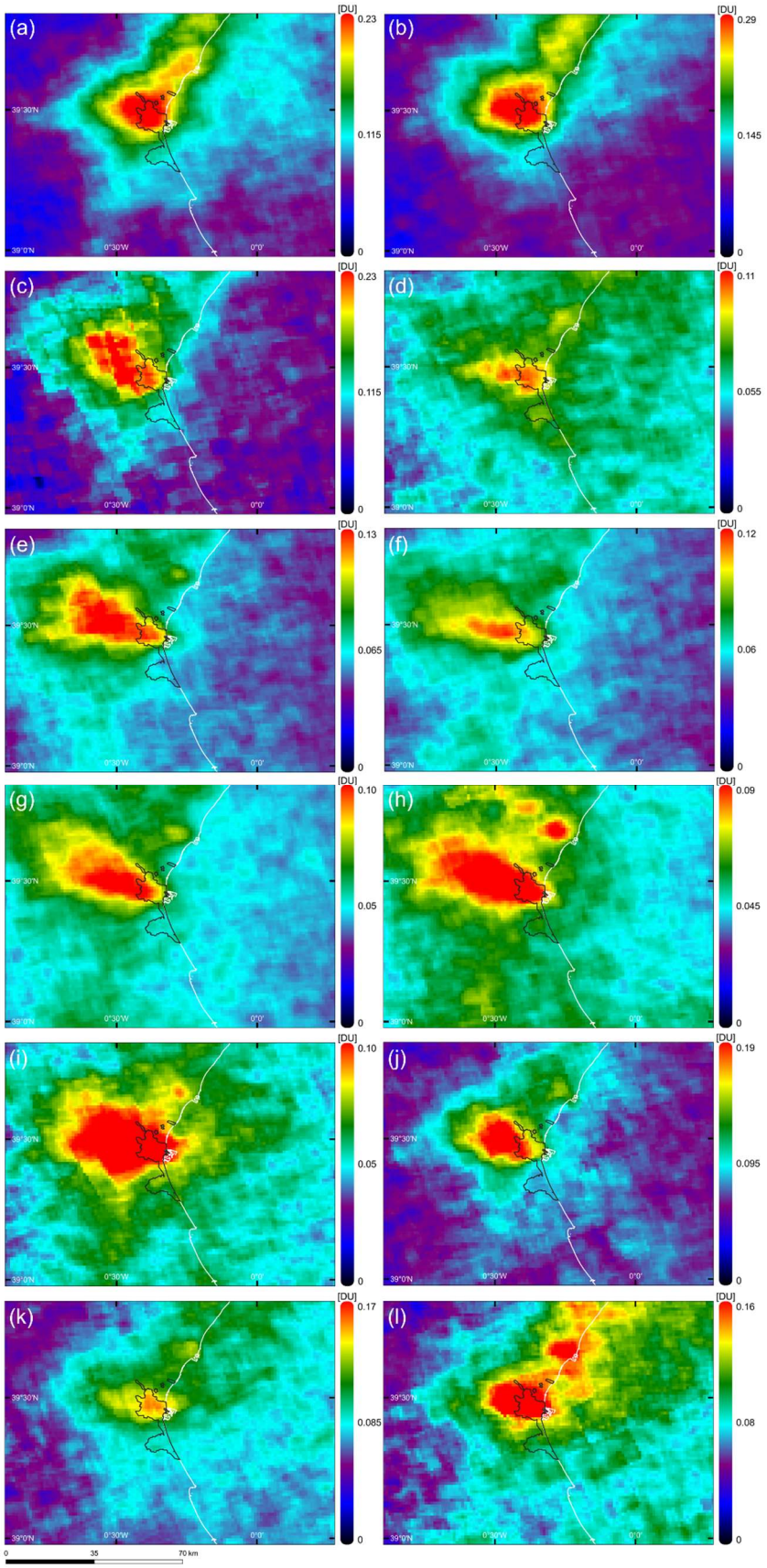


Figure S6. Monthly maps of mean tropospheric TROPOMI NO_2 column (DU) over Valencia and its surroundings in (a) January, (b) February, (c) March, (d) April, (e) May, (f) June, (g) July, (h) August, (i) September, (j) October, (k) November and (l) December of 2022. Black lines represent the city limits. White lines represent the coastline.

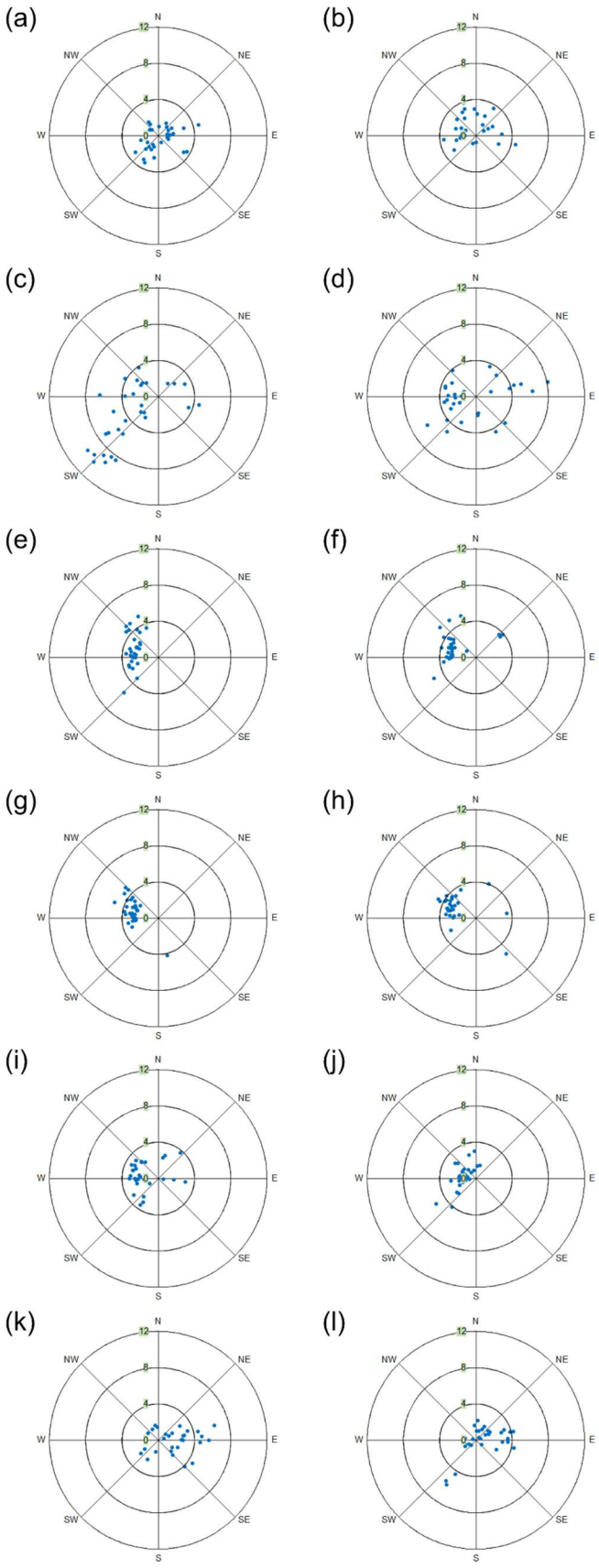


Figure S7. Monthly distribution of wind distribution in Valencia in 2022: January (a), February (b), March (c), April (d), May (e), June (f), July (g), August (h), September (i), October (j), November (k), December (l). Blue dots represent average wind speed and direction in a day between Sentinel-5P overpass times.