Supplementary Material

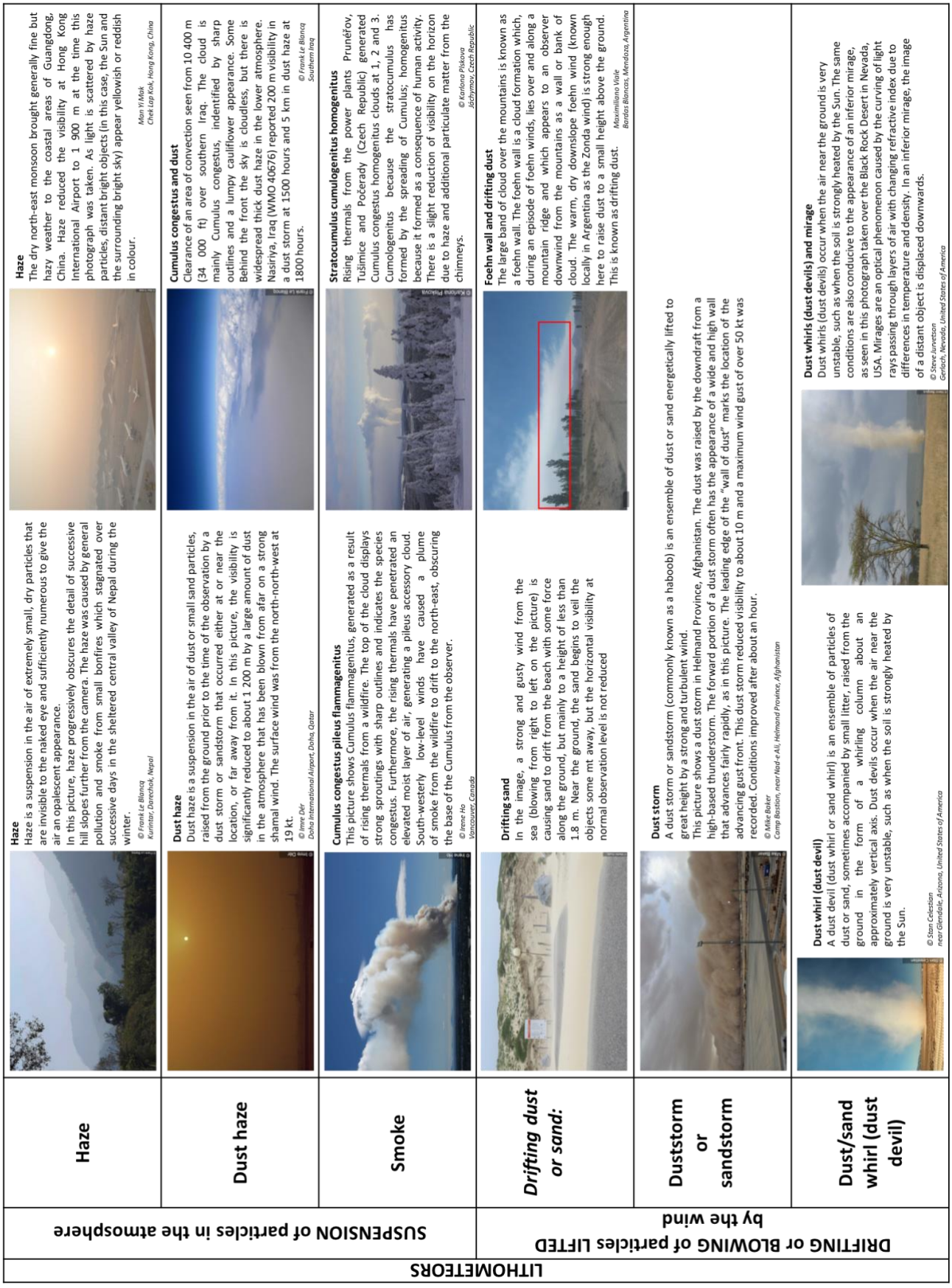

Figure S1. Lithometeors Classification of the World Meteorological Organization: figures and descriptions directly from https://cloudatlas.wmo.int/

Table S1

Averaged descriptive statistics for primary and remobilised samples.

Type of deposit	Median Mdϕ*	Median (μm)	Sorting# (σ_ϕ)	Mode (μm)	2.5th – 97.5th percentile difference (μm)
Primary deposit – Unit III					
Primary proximal	-2– 4.71	4 ×10^3 – 38	1.20 – 3.54	1.1 ×10^3 and 40	6 – 22 x 10^3
Primary distal	5.06 – 5.26	26 – 30	1.50 – 1.59	45	2 – 91
Remobilised-associated material					
Plant - windward	4.29 – 4.83	35 – 51	1.24 – 1.49	45	3 – 114
Plant – leeward	2.88 – 3.96	64 – 135	0.80 – 0.88	90	11 – 250
Interpatch	5.39 – 5.35	23 – 25	1.59 – 1.60	30	2 – 72
Rock - leeward	5.05 – 5.06	29 - 30	1.63 – 1.64	35	1 – 125
Fine – ash lens	5.05 – 5.26	26 – 30	1.63 – 1.65	30	1 – 103
Coarse – ash mound layers	2.99 – 4.42	47 – 126	0.83 – 1.61	95	5 – 255
Airborne – 0.15m	3.44 – 4.29	51 – 92	0.93 – 1.47	65	3 – 250
Airborne – 0.50m	3.75 – 4.62	41 - 74	0.98 – 1.13	65	3 – 150
Airborne – 1.50m	3.63 – 4.50	44 – 81	0.79 – 1.09	65	2 – 144

*$\phi = -\log_2 D/D_0$, where $D_0 = 1$ mm.

#Sorting, calculated as the Inman graphic standard deviation in phi units, $\alpha_\phi = (P84 – P16)/2$ where P16 and P84 correspond to 16th and 84th percentiles respectively (Inman 1952).

Table S2

Comparison of primary (black) and remobilized (magenta) shape descriptors for the 3 size classes. Outliers correspond to points larger that P75+w(P75 - P25); where P25 and P75 correspond to the 25th and 75th percentiles respectively, and w corresponds to the whisker width, fixed at 1.5. This width corresponds to approximately +/- 2.7σ and 99.3 coverage if the data is normally distributed.

SOLIDITY

Statistics	Class 1: <63µm	Class 2: 63 – 125 µm	Class 3: > 125µm
Median	0.806	0.767	0.844
	0.828	0.828	0.832
Minimum	0.271	0.272	0.347
	0.328	0.099	0.395
Maximum	0.924	0.927	0.924
	0.963	0.942	0.940
N (number of particles)	215	180	342
	804	602	461
75th percentile	0.849	0.831	0.873
	0.881	0.872	0.871
25th percentile	0.746	0.704	0.811
	0.759	0.779	0.787
Number of outliers	10	17	22
	40	27	15

CONVEXITY

Statistics	Class 1: <63µm	Class 2: 63 – 125 µm	Class 3: > 125µm
Median	0.849	0.741	0.752
	0.788	0.829	0.738
Minimum	0.567	0.317	0.378
	0.335	0.523	0.391
Maximum	0.991	0.966	0.962
	0.998	0.996	0.970
N (number of particles)	215	180	342
	804	602	461
75th percentile	0.917	0.828	0.818
	0.867	0.881	0.820
25th percentile	0.772	0.598	0.641
	0.654	0.736	0.647
Number of outliers	6	0	7
	10	25	7

CIRCULARITY

Statistics	Class 1: <63µm	Class 2: 63 – 125 µm	Class 3: > 125µm
Median	0.806	0.767	0.844
	0.828	0.828	0.832
Minimum	0.271	0.272	0.347
	0.328	0.099	0.395
Maximum	0.924	0.927	0.924
	0.963	0.942	0.940
N (number of particles)	215	180	342
	804	602	461
75th percentile	0.849	0.831	0.873
	0.881	0.872	0.871
25th percentile	0.746	0.704	0.811
	0.759	0.779	0.787
Number of outliers	10	17	22
	40	27	15

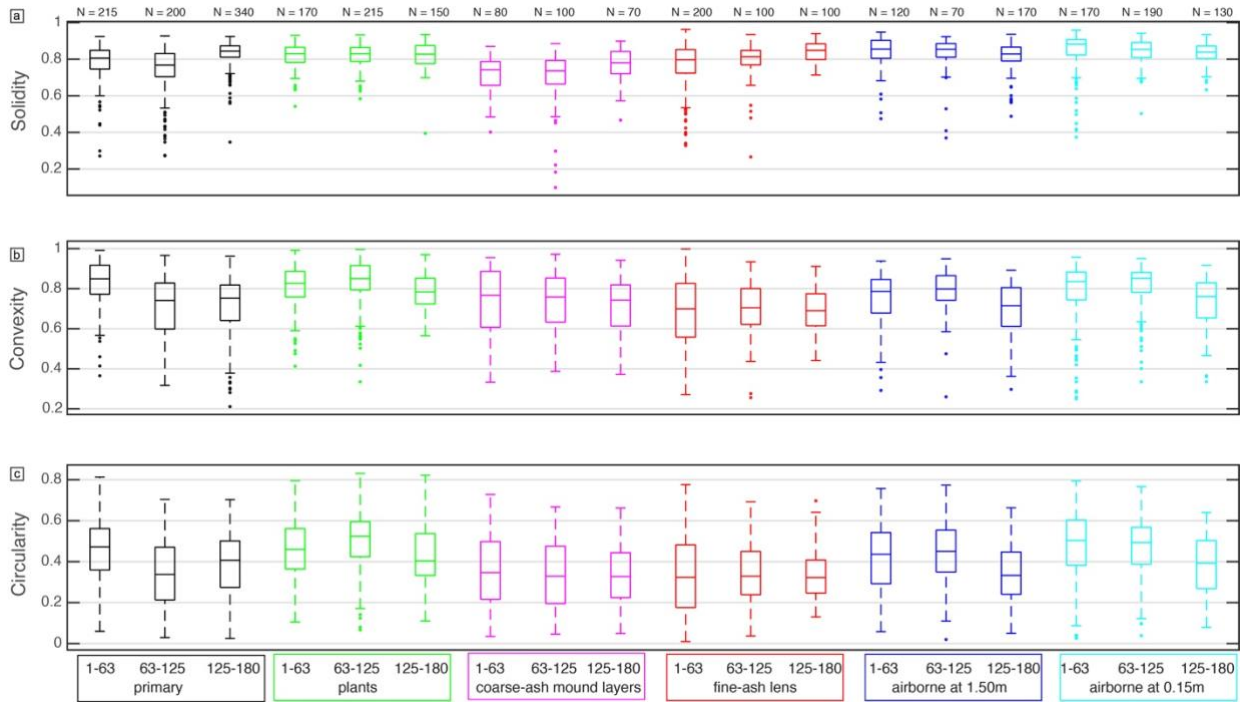

Figure S2. Box and whisker plots showing a) solidity, b) convexity and c) circularity for primary and remobilised ash. Remobilised material is discriminated into ground samples (plants, coarse-ash mound layers and fine-ash lenses) and airborne material collected at different heights (0.15m and 1.50m). Each shape parameter is dimensionless and scaled from zero to one, with one being a perfect . N is the number of particles analysed per sample.