

Supplementary Materials for

White and wonderful? Microplastics prevail in snow from the Alps to the Arctic

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Fig. S1. Length frequency (%) of microfibers found in Arctic and European snow.

Note S1. Calculation of propagation of uncertainty of results regarding possible contamination.

Table S1. Concentration of MPs, fibers polymer types, and other particles detected in snow samples.

Other Supplementary Material for this manuscript includes the following:

(available at advances.sciencemag.org/cgi/content/full/5/8/eaax1157/DC1)

Table S2 (Microsoft Excel format). Concentration of MPs, fibers, polymer types, and other particles detected in snow samples as well as size frequency distribution and metadata.

Table S3 (Microsoft Excel format). Number, size, and color of fibers measured in Arctic and European snow samples.

Table S4 (Microsoft Excel format). Concentration, composition, and size of MPs detected in blank samples.

Table S1. Concentration of MPs, fibers polymer types, and other particles detected in snow samples. All values are given as N L⁻¹ unless stated otherwise. Some values diverge slightly as a result of rounding calculations (see Supplementary Table 2 for data based on non-rounded values and calculations).

	Ice Floe									Svalbard					Heligoland		Bremen	Bavaria			Tschuggen	Davos
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	1	2		1	2	3		
Filtrated volume [L]	0.078	0.014	0.204	0.008	0.092	0.061	0.125	0.140	0.015	0.106	0.010	0.195	0.246	0.016	0.006	0.005	0.058	0.042	0.038	0.018	0.11	0.028
Total particles [N]	11	10	53	776	266	324	495	7187	579	763	194	1303	3953	120	3048	2795	4372	6770	8873	5498	1591	1258
Polymer particle [N]	10	0	4	5	20	14	11	26	216	39	7	165	30	18	66	88	115	109	5903	107	21	76
Total MPs [N L ⁻¹]	124	0	20	602	218	230	88	186	14400	369	680	846	122	1111	11786	17600	2000	2627	154137	6114	191	2676
MPs [%]	87.9	0.0	7.5	0.6	7.5	4.3	2.2	0.4	37.3	5.1	3.6	12.7	0.8	15	2.2	3.1	2.6	1.6	66.5	1.9	1.3	6
Fibers [N L ⁻¹]	85	383	43	10186	774	584	121	123	145	579	1498	181	103	130	838	2745	1927	210	1537	2573	690	931
Polyethylene	23	0	0	0	0	16	0	0	0	9	0	113	4	62	536	400	52	651	11193	0	9	70
Polyethylene oxidized	0	0	0	0	11	0	0	0	133	0	0	0	0	0	0	0	17	193	1348	0	0	0
Polyethylene chlorinated	0	0	0	0	0	0	8	7	0	0	0	15	0	0	0	0	0	0	1817	0	0	35
Polypropylene	0	0	0	0	0	16	16	93	0	19	0	5	4	0	536	3800	17	24	38	0	9	0
Polystyrene	0	0	0	0	0	0	0	0	0	0	0	10	41	62	0	0	0	0	0	0	0	0
Polycarbonate	0	0	0	0	0	0	0	0	67	0	0	0	0	0	0	0	0	0	0	0	0	0
Polyamide	0	0	0	0	153	49	0	0	0	9	0	82	28	0	357	400	139	867	21571	1486	55	352
Polyvinylchloride	0	0	0	0	0	0	0	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cellulose chemical modified	0	0	0	0	11	0	0	0	0	19	97	26	0	0	0	200	52	0	430	57	0	0
Nitrile rubber	0	0	5	241	22	66	32	0	0	218	485	144	0	741	3750	12200	17	72	1172	57	0	739
Polyester	75	0	0	0	11	16	0	0	0	9	0	62	20	185	357	0	0	48	62	57	0	35
Acrylates/polyurethane s/varnish/lacquer	14	0	10	361	0	16	0	0	11200	47	97	77	12	0	2321	200	1548	72	3389	4400	55	458
Polychloroprene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35
Polylactic acid	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0
Polycaprolactone	0	0	0	0	0	0	0	0	67	0	0	0	0	0	0	0	0	0	0	0	0	246
Ethylene-vinyl-acetate	0	0	5	0	0	0	8	0	867	0	0	82	0	0	536	400	104	24	415	57	18	176
Polyimide	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
Rubber type 1	13	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	24	31097	0	0	70
Rubber type 3	0	0	0	0	0	49	24	0	2067	28	0	231	8	62	3393	0	52	651	81606	0	45	458
Animal fur	0	65	0	482	218	1492	152	15579	533	284	1359	1944	14469	1667	25179	21000	6226	106747	2229	124114	8245	16373
Charcoal	0	0	0	0	0	0	0	0	0	9	0	5	0	0	3036	4400	0	0	5144	286	0	669
Coal	0	0	0	0	0	0	0	0	0	9	0	72	4	123	0	0	0	0	0	0	0	0
Chitin	0	0	0	0	11	66	0	3786	0	123	194	179	256	62	4107	13400	261	3614	399	1143	82	4225
Plant fibers	6	611	218	64096	1561	3246	3192	31771	23467	5440	9029	2923	1233	2469	455357	400400	67339	49880	67048	182114	5927	16866
Sand	11	73	24	28313	895	279	528	14	200	984	7573	713	4	1975	44821	102200	209	265	2715	400	18	3486

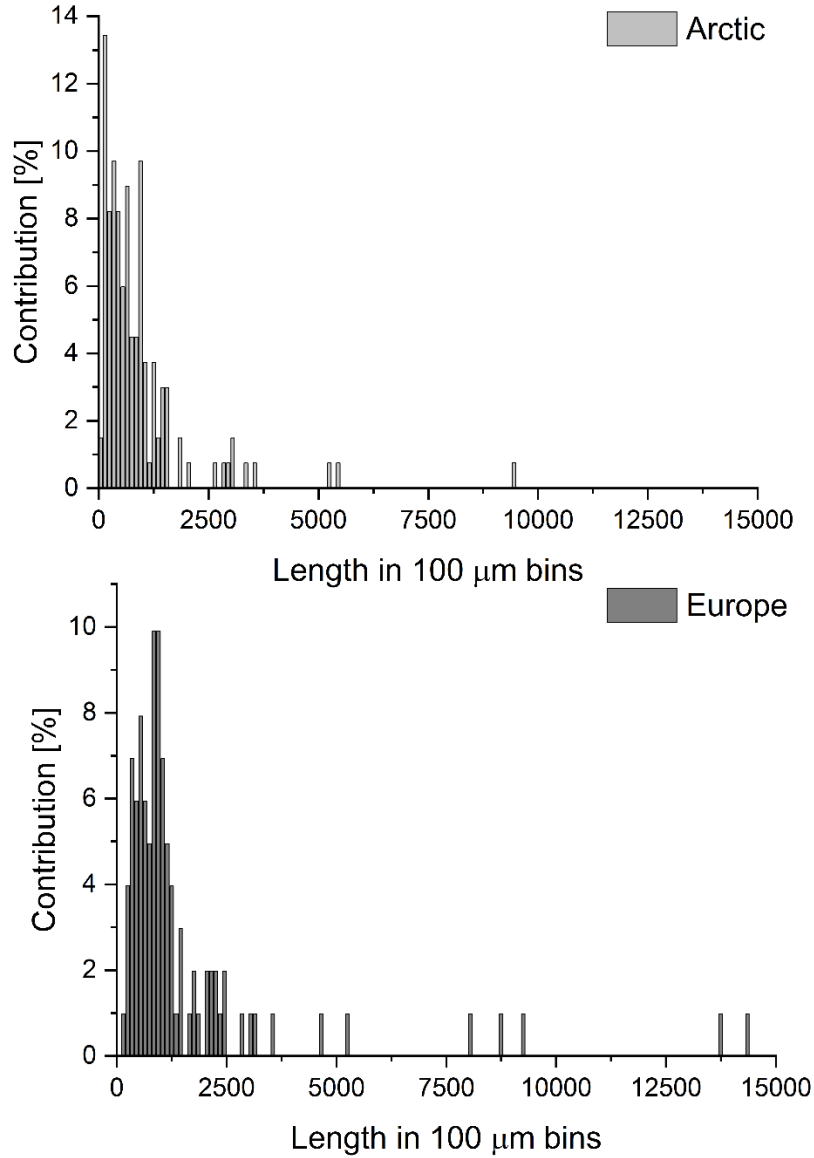


Fig. S1. Length frequency (%) of microfibers found in Arctic and European snow. Each bar represents a size bin of 100 μm . Note: these fibers were not identified as polymers.

Note S1. Calculation of propagation of uncertainty of results regarding possible contamination. To address uncertainties due to the missing field blanks we calculated the uncertainty of our values with regards to the error of particle numbers of FTIR (5%, $N(FTIR)$), the filtration process and the minimum number ($N(Low. N.) = 5$ of Ice Floe 4) found in samples from glass containers following an approach similar to (45) using the following equation;

$$\Delta N(Snow) = \sqrt{\left(\frac{1}{V^2} \times (N(FTIR) + N(Low. N.))\right)^2 + \left(\frac{N}{-V^2} \times \Delta V\right)^2}$$

This calculation lead to an average relative error of 37% of the presented values, while sample with low numbers of particles detected were generally having a higher value. Only two samples showed a relative error value above 100% (Ice Floe 3 and 4). Ice Floe 3 was already blank-corrected while Ice Floe 4 showed the lowest number of particles.