Appendix

Table S1. Equations used to estimate microplastic volume for fibres, films, fragments, foams, and tire wear particles, modified from Simon et al. (2018).

Microplastic shape	**Volume Formula**	**Variable Definitions**
Fibre	$V = \pi \times r^2 \times h$	r = Width / 2 h = Length
Film	$V = l \times w \times h$	l = Major Axis w = Minor Axis h = Minor Axis (Fibres)
Fragment	$V = 4/3\ \pi\ abc$	a = Major Axis / 2 b = Minor Axis / 2 c = Minor Axis / 2
Foam	$V = 4/3\ \pi\ abc$	a = Major Axis / 2 b = Minor Axis / 2 c = Minor Axis / 2
Tire wear particle	$V = 4/3\ \pi\ abc$	a = Major Axis / 2 b = Minor Axis / 2 c = Minor Axis / 2

Table S2. Density (gram per cubic meter; g/cm^3) for plastic polymers identified by Fourier-transform Infrared spectroscopy for each microplastic shape (i.e., fibres, fragments, films, foams, and tire wear particles). Average density was used in to calculate mass concentrations.

Microplastic Shape	Polymer Type	Density g/cm^3
Fibre	Polyester	1.37
	Polyethylene terephthalate	1.36
	Polyacrylonitrile	1.17
	Polyethylene	1.2
	Average	**1.28**
Fragment	Polystyrene	1.005
	Polystyrene	1.12
	Poly(vinyl chloride)	1.28
	Average	**1.18**
Film	Polystyrene	1.005
	Average	**1.005**
Foam	Poly(vinyl chloride)	1.4
	Poly(vinly butyral)	1.12
	Polyurethane	1.12
	Average	**1.21**
Tire wear particle	Low Density Polyethylene	0.923
	Nitrile	1.0
	Poly(vinyl butyral)	1.12
	Polypropylene	0.87
	Polyethylene	1.2
	Polystyrene	1.005
	Poly(vinyl chloride)	1.37
	Rubber	1.1
	Polyethylene terephthalate	1.36
	Average	**1.11**

Table S3. All plastic polymer types identified using Fourier-Transform Infrared spectroscopy across commercial parking lots (IQ-COM-P), commercial roadsides (IQ-COM-R), and industrial roadsides (IQ-IND-R) with the hit rate, which represents the Pearson's Correlation between the sample spectra and polymer library spectra. The spectrum for each sample were uploaded to an online library of polymer spectra (OpenSpecy: https://openanalysis.org/openspecy/), which reported the Pearson's Correlation (hit count) between the sample and library entries.

SiteID	Microplastic shape	Hit Count	Polymer
IQ-COM-P	Tire	0.68	Polyvinyl chloride
IQ-COM-P	Tire	0.9	Rubber
IQ-COM-P	Tire	0.76	Polyethylene
IQ-COM-P	Tire	0.89	Rubber
IQ-COM-P	Tire	0.71	Rubber
IQ-COM-P	Tire	0.73	Polyethylene
IQ-COM-P	Tire	0.57	Rubber
IQ-COM-P	Fibre	0.68	Polyethylene
IQ-COM-P	Tire	0.84	Rubber
IQ-COM-P	Tire	0.74	Polystyrene
IQ-COM-P	Tire	0.82	Polyvinyl chloride
IQ-COM-P	Tire	0.65	Poly(vinyl butyral)
IQ-COM-P	Tire	0.6	Polystyrene
IQ-COM-P	Tire	0.78	Polypropylene
IQ-COM-P	Tire	0.75	Polystyrene
IQ-COM-P	Tire	0.82	Rubber
IQ-COM-P	Tire	0.87	Rubber
IQ-COM-P	Tire	0.65	Polyethylene
IQ-COM-P	Tire	0.76	Polystyrene
IQ-COM-P	Tire	0.77	Polypropylene
IQ-COM-P	Tire	0.75	Polyvinyl chloride
IQ-COM-P	Tire	0.8	Rubber
IQ-COM-P	Tire	0.82	Rubber
IQ-COM-P	Tire	0.8	Rubber
IQ-COM-P	Fibre	0.5	Polyester
IQ-COM-P	Fibre	0.58	Polyester
IQ-COM-P	Tire	0.73	Polypropylene
IQ-COM-P	Tire	0.76	Polystyrene
IQ-COM-P	Tire	0.69	Polyethylene
IQ-COM-P	Tire	0.67	Polypropylene
IQ-COM-P	Tire	0.78	Rubber
IQ-COM-P	Tire	0.45	Rubber
IQ-COM-P	Tire	0.63	Polyvinyl chloride
IQ-COM-P	Tire	0.52	Polyvinyl chloride
IQ-COM-P	Tire	0.85	Rubber
IQ-COM-P	Tire	0.77	Polystyrene
IQ-COM-P	Tire	0.73	Rubber
IQ-COM-P	Tire	0.66	Polystyrene

SiteID	Microplastic shape	Hit Count	Polymer
IQ-COM-P	Tire	0.77	Polystyrene
IQ-COM-P	Tire	0.77	Polyethylene
IQ-COM-P	Tire	0.69	Nitrile
IQ-COM-P	Tire	0.8	Polyethylene
IQ-COM-P	Tire	0.64	Polyethylene
IQ-COM-P	Tire	0.81	Polypropylene
IQ-COM-P	Tire	0.7	Polystyrene
IQ-COM-P	Foam	0.81	Polyurethane
IQ-COM-P	Tire	0.81	Rubber
IQ-COM-P	Tire	0.58	Polystyrene
IQ-COM-P	Tire	0.69	Polypropylene
IQ-COM-P	Tire	0.68	Polypropylene
IQ-COM-P	Foam	0.68	Polyvinyl chloride
IQ-COM-P	Tire	0.68	Rubber
IQ-COM-P	Tire	0.68	Polypropylene
IQ-COM-P	Tire	0.66	Rubber
IQ-COM-P	Tire	0.93	Rubber
IQ-COM-P	Tire	0.68	Rubber
IQ-COM-P	Tire	0.75	Polyethylene
IQ-COM-P	Tire	0.54	Rubber
IQ-COM-P	Tire	0.61	Polystyrene
IQ-COM-P	Tire	0.58	Rubber
IQ-COM-P	Tire	0.56	Rubber
IQ-COM-P	Tire	0.72	Rubber
IQ-COM-P	Tire	0.61	Rubber
IQ-COM-P	Tire	0.69	Rubber
IQ-COM-P	Tire	0.68	Rubber
IQ-COM-P	Tire	0.56	Rubber
IQ-COM-P	Tire	0.79	Rubber
IQ-COM-P	Tire	0.83	Polypropylene
IQ-COM-P	Tire	0.58	Rubber
IQ-COM-P	Tire	0.79	Rubber
IQ-COM-P	Tire	0.65	Rubber
IQ-COM-P	Tire	0.67	Rubber
IQ-COM-P	Tire	0.65	Rubber
IQ-COM-P	Tire	0.53	Polyvinyl chloride
IQ-COM-P	Tire	0.55	Rubber
IQ-COM-P	Tire	0.64	Rubber
IQ-COM-P	Tire	0.58	Rubber
IQ-COM-P	Tire	0.54	Polyvinyl chloride
IQ-COM-P	Fragment	0.89	Polymethylacrylate
IQ-COM-P	Fragment	0.89	Polymethylacrylate
IQ-COM-P	Fragment	0.94	Polyethylene terephthalate
SiteID	Microplastic shape	Hit Count	Polymer

IQ-COM-P	Tire	0.87	Rubber
IQ-COM-P	Tire	0.84	Rubber
IQ-COM-P	Tire	0.56	Polyethylene
IQ-COM-P	Tire	0.84	Polystyrene
IQ-COM-P	Tire	0.75	Polystyrene
IQ-COM-P	Tire	0.7	Polyvinyl chloride
IQ-COM-P	Tire	0.54	Rubber
IQ-COM-P	Tire	0.77	Polyethylene
IQ-COM-P	Tire	0.72	Polystyrene
IQ-COM-P	Tire	0.8	Polystyrene
IQ-COM-P	Tire	0.77	Polystyrene
IQ-COM-P	Tire	0.77	Polyethylene
IQ-COM-P	Tire	0.69	Nitrile
IQ-COM-P	Tire	0.8	Polyethylene
IQ-COM-P	Tire	0.67	Polyethylene
IQ-COM-P	Tire	0.81	Polypropylene
IQ-COM-P	Tire	0.7	Polystyrene
IQ-COM-P	Tire	0.54	Polyvinyl chloride
IQ-COM-R	Tire	0.68	Rubber
IQ-COM-R	Tire	0.78	Polypropylene
IQ-COM-R	Tire	0.77	Polyethylene
IQ-COM-R	Tire	0.79	Polypropylene
IQ-COM-R	Tire	0.6	Polyethylene
IQ-COM-R	Tire	0.67	Polyethylene
IQ-COM-R	Film	0.63	Polystyrene
IQ-COM-R	Tire	0.72	Polyethylene
IQ-COM-R	Tire	0.85	Polyethylene
IQ-COM-R	Tire	0.75	Polypropylene
IQ-COM-R	Tire	0.72	Polypropylene
IQ-COM-R	Fibre	0.81	Polyacrylonitriles
IQ-COM-R	Tire	0.84	Rubber
IQ-COM-R	Fibre	0.86	Polyethylene terephthalate
IQ-COM-R	Tire	0.78	Polypropylene
IQ-COM-R	Tire	0.72	Polyethylene
IQ-COM-R	Tire	0.72	Polyvinyl chloride
IQ-COM-R	Tire	0.69	Polypropylene
IQ-COM-R	Tire	0.6	Polyvinyl chloride
IQ-COM-R	Tire	0.74	Polypropylene
IQ-COM-R	Tire	0.71	Polypropylene
IQ-COM-R	Tire	0.73	Polypropylene
IQ-COM-R	Tire	0.75	Polypropylene
IQ-COM-R	Tire	0.6	Polyvinyl chloride
IQ-COM-R	Tire	0.6	Polypropylene
SiteID	**Microplastic shape**	**Hit Count**	**Polymer**
IQ-COM-R	Tire	0.82	Rubber

IQ-COM-R	Tire	0.55	Rubber
IQ-COM-R	Tire	0.54	Polyethylene
IQ-IND-R	Tire	0.59	Polypropylene
IQ-IND-R	Tire	0.7	Polyethylene
IQ-IND-R	Tire	0.68	Polyethylene
IQ-IND-R	Tire	0.61	Polypropylene
IQ-IND-R	Tire	0.62	Rubber
IQ-IND-R	Tire	0.94	Polyethylene
IQ-IND-R	Tire	0.94	Polyethylene
IQ-IND-R	Tire	0.94	Polyethylene
IQ-IND-R	Tire	0.94	Polyethylene
IQ-IND-R	Tire	0.8	Polypropylene
IQ-IND-R	Tire	0.72	Polyvinyl chloride
IQ-IND-R	Tire	0.75	Polypropylene
IQ-IND-R	Tire	0.75	Polystyrene
IQ-IND-R	Tire	0.7	Rubber
IQ-IND-R	Tire	0.68	Polypropylene
IQ-IND-R	Tire	0.8	Polystyrene
IQ-IND-R	Tire	0.68	Polypropylene
IQ-IND-R	Tire	0.76	Polypropylene
IQ-IND-R	Tire	0.76	Polypropylene
IQ-IND-R	Foam	0.6	Poly(vinly butyral)
IQ-IND-R	Tire	0.73	Polypropylene
IQ-IND-R	Tire	0.75	Polypropylene
IQ-IND-R	Tire	0.54	Polyvinyl chloride
IQ-IND-R	Tire	0.75	Polyethylene
IQ-IND-R	Tire	0.75	Polypropylene
IQ-IND-R	Tire	0.67	Polypropylene
IQ-IND-R	Tire	0.57	Polyethylene terephthalate
IQ-IND-R	Tire	0.84	Rubber
IQ-IND-R	Tire	0.59	Polypropylene
IQ-IND-R	Tire	0.73	Polypropylene
IQ-IND-R	Tire	0.62	Rubber
IQ-IND-R	Tire	0.73	Polystyrene
IQ-IND-R	Tire	0.7	Polystyrene
IQ-IND-R	Tire	0.71	Polystyrene
IQ-IND-R	Tire	0.74	Polyethylene
IQ-IND-R	Tire	0.63	Rubber
IQ-IND-R	Fragment	0.8	Polystyrene
IQ-IND-R	Tire	0.6	Polyvinyl chloride
IQ-IND-R	Tire	0.59	Polyvinyl chloride
IQ-IND-R	Tire	0.44	Polyvinyl chloride

SiteID	**Microplastic shape**	**Hit Count**	**Polymer**
IQ-IND-R	Tire	0.55	Polyvinyl chloride
IQ-IND-R	Tire	0.7	Polystyrene

IQ-IND-R	Tire	0.74	Polystyrene
IQ-IND-R	Tire	0.74	Polystyrene
IQ-IND-R	Tire	0.69	Polyethylene
IQ-IND-R	Tire	0.74	Polyethylene
IQ-IND-R	Tire	0.7	Polypropylene
IQ-IND-R	Tire	0.54	Polyvinyl chloride
IQ-IND-R	Tire	0.78	Polypropylene
IQ-IND-R	Tire	0.67	Polyvinyl chloride
IQ-IND-R	Tire	0.65	Polypropylene
IQ-IND-R	Tire	0.63	Polystyrene
IQ-IND-R	Tire	0.69	Polypropylene
IQ-IND-R	Tire	0.73	Polyvinyl chloride
IQ-IND-R	Tire	0.59	Polyvinyl chloride
IQ-IND-R	Tire	0.76	Rubber
IQ-IND-R	Tire	0.72	Polyethylene
IQ-IND-R	Tire	0.6	Polyvinyl chloride
IQ-IND-R	Tire	0.52	Nitrile
IQ-IND-R	Tire	0.53	Polystyrene
IQ-IND-R	Tire	0.61	Low-Density Polyethylene
IQ-IND-R	Tire	0.68	Polypropylene
IQ-IND-R	Tire	0.62	Polyvinyl chloride
IQ-IND-R	Tire	0.7	Polyethylene
IQ-IND-R	Tire	0.71	Polypropylene
IQ-IND-R	Tire	0.68	Polystyrene
IQ-IND-R	Tire	0.74	Polystyrene
IQ-IND-R	Tire	0.75	Polystyrene
IQ-IND-R	Tire	0.64	Polyethylene
IQ-IND-R	Tire	0.71	Polystyrene
IQ-IND-R	Tire	0.68	Polystyrene
IQ-IND-R	Tire	0.72	Polystyrene
IQ-IND-R	Tire	0.72	Polystyrene
IQ-IND-R	Tire	0.68	Polyvinyl chloride
IQ-IND-R	Tire	0.7	Polystyrene
IQ-IND-R	Tire	0.6	Polyethylene
IQ-IND-R	Tire	0.7	Polyethylene
IQ-IND-R	Tire	0.63	Nitrile
IQ-IND-R	Tire	0.65	Polyvinyl chloride
IQ-IND-R	Tire	0.68	Polypropylene
IQ-IND-R	Tire	0.73	Rubber
IQ-IND-R	Tire	0.59	Rubber
IQ-IND-R	Tire	0.64	Polyethylene

SiteID	Microplastic shape	Hit Count	Polymer
IQ-IND-R	Tire	0.58	Rubber
IQ-IND-R	Tire	0.61	Polyvinyl chloride
IQ-IND-R	Tire	0.59	Rubber

IQ-IND-R	Tire	0.64	Rubber
IQ-IND-R	Tire	0.62	Rubber
IQ-IND-R	Tire	0.72	Rubber
IQ-IND-R	Tire	0.6	Rubber
IQ-IND-R	Tire	0.6	Polyethylene
IQ-IND-R	Tire	0.63	Rubber
IQ-IND-R	Tire	0.59	Polyethylene
IQ-IND-R	Tire	0.52	Rubber
IQ-IND-R	Tire	0.55	Rubber
IQ-IND-R	Tire	0.59	Rubber
IQ-IND-R	Tire	0.57	Rubber
IQ-IND-R	Tire	0.61	Rubber
IQ-IND-R	Tire	0.68	Polyethylene
IQ-IND-R	Tire	0.56	Polypropylene
IQ-IND-R	Tire	0.74	Polypropylene
IQ-IND-R	Tire	0.74	Polypropylene
IQ-IND-R	Tire	0.66	Polyethylene

Table S4. Microplastic counts by shape (fibres, films, fragments, and foam) in road dust (grams; g) from commercial parking lots (IQ-COM-P; n = 4), commercial roadsides (IQ-COM-R; n = 4), and industrial roadsides (IQ-IND-R; n = 8) in Iqaluit, Nunavut.

SiteID	Sum Road Dust	Fibres	Films	Fragments	Foams
	g	#	#	#	#
IQ-COM-P1	1.08	7	4	1	0
IQ-COM-P2	1.10	3	1	6	1
IQ-COM-P3	1.02	1	2	5	1
IQ-COM-P4	1.17	0	1	1	0
IQ-COM-R1	1.07	1	0	0	0
IQ-COM-R2	1.04	2	0	0	0
IQ-COM-R3	1.15	2	1	2	0
IQ-COM-R4	1.03	2	0	1	0
IQ-IND-R1	1.05	1	0	0	0
IQ-IND-R2	1.03	0	1	4	1
IQ-IND-R3	1.16	1	2	3	0
IQ-IND-R4	1.06	1	0	1	0
IQ-IND-R5	1.18	2	3	10	0
IQ-IND-R6	1.08	0	0	7	0
IQ-IND-R7	1.08	0	0	0	0
IQ-IND-R8	1.05	2	0	7	0

Table S5. The concentration and characteristics of microplastics in road dust worldwide.

	Units	Current study	Patchaiyappan et al., 2021	O'Brien et al., 2020	Su et al., 2020	Yukioka et al., 2019	Yukioka et al., 2019	Yukioka et al., 2019	Kang et al., 2022
Study area		Iqaluit, Nunavut	Chennai, India	Brisbine, Australia	Victoria, Australia	Kasatsu, Japan	Da Nang, Vietnam	Kathmandu, Nepal	Goyang, South Korea
Population		8,000	6.7 million	1.2 million	6.6 million	139,000	1.1 million	856,000	1.1 million
Number of sites	n	16	16	7	16	12	12	13	8
Site characteristics		Commercial Industrial	Governmental Industrial Residential	Rural residential	–	Residential	–	–	–
Field sampling method		Natural fibre bush and metal dust	Paint brush	Natural fibre bush and metal dust	Metal spoon	Vacuum cleaner	Vacuum cleaner	Vacuum cleaner	Wooden brush
Size detection	**µm**	50–2000	11–5000	< 5000	80–4700	100–5000	100–5000	100–5000	100–1000
Observed shapes		Fibre Fragment Film Foam	Fibre Fragment	–	Fibre Film Fragment Bead	Fragment Granule Film Fibre	Fragment Granule Film Fibre	Fragment Granule Film Fibre	Fibre Film Flakes Black Particles
Concentration	**n/g**	3.9 ± 2.43	2.28 ± 0.89	–	0.021–0.529	2.50	4.10	3.90	~1363
Deposition		2.83 ± 3.72	–	500–6000	–	–	–	–	–
	n/m^2	53.8 ± 49.0				2.00 ± 1.60	19.7 ± 13.7	12.5 ± 10.1	–
Plastic polymers identified		PE, PES, PET, PU, PS, PP, PAN, PAC, PEMA, PVB	PVC, PECVA, HDPE, AC-395, superflex 200	PP, PS, PET, PVC, PMMA, PE	PP, PET	PE, PP, PS, PET, PAK, EPC, SBR, EPDM, PU	PE, PP, PS, PET, PAK, PVS, EPC, SR, EPDM, PU	PE, PP, PS, PET, PAK, PVS, EPC, SBR, PU	Poly(butadiene: styrene)

PE: Polyethylene; PP: Polypropylene; PS: Polystyrene; PET: Polyethylene terephthalate; PU: Polyurethane; PVC: Polyvinyl chloride; PMMA: Polymethyl methacrylate; PDAP: Polydiallyl phthalate; PVDF: Polyvinylidene difluoride; PES: Polyester; PMMA: Polymethyl methacrylate; SR: Styrene rubber; PAK: Polyacrylate; EPC: Ethylene/propylene copolymer; SBR: Styrene-butadiene rubber, EPDM: Ethylene/propylene/diene rubber; PVS: Polyvinyl stearate; HDPE: High-density polyethylene; PAN: Polyacrylonitrile; PAC: Polyethylene chlorosulfonate ; PEMA: Poly(ethyl methacrylate); PVB: Poly(vinyl butyral); PECVA: Poly(ethylene co-vinyl acetate); –: Not available.

Table S6. Sediment wet weight (grams; g), dry weight (grams; g), and moisture content (percent; %) across the study sites (n = 19) on Baffin Island, Nunavut.

SiteID	Weight Wet	Dry Weight	Moisture Content
	g	g	%
IQ-12	2.33	1.30	44
IQ-14	4.21	2.99	29
IQ-15	8.65	6.84	21
IQ-17	4.90	3.61	26
IQ-20	3.29	1.66	50
IQ-21	6.15	4.88	21
IQ-22	4.45	2.97	33
IQ-23	3.93	2.43	38
IQ-24	5.20	3.48	33
IQ-25	4.60	3.21	30
IQ-34	5.61	2.67	52
IQ-40	3.93	1.38	65
IQ-42	3.10	2.20	29
IQ-43	9.46	7.34	22
IQ-45	4.54	0.38	92
IQ-46	7.56	5.44	28
IQ-49	5.95	4.71	21
IQ-50	9.16	6.39	30
IQ-52	6.88	3.68	47
IQ-65	5.35	3.94	26

Table S7. Density (gram per cubic meter; g/cm^3) for plastic polymers identified by Fourier-transform Infrared spectroscopy for lake water, sediment, and moss samples. Average density was used in to calculate microplastic (fibres, fragment, film, and foam) and tire wear particle mass.

Environmental Media	Shape	Polymer type	Density g/cm^3
Lake water	Fibre	Polyamide	1.03
		Polyamide 6	1.13
		Polyester	1.37
		Polyethylene terephthalate	1.36
		Average	**1.22**
	Fragment	High-density polyethylene	0.95
		Polyester	1.37
		Polystyrene	1.00
		Average	**1.11**
	Film	Polyethylene terephthalate	1.36
		Polyamide	1.03
		Polycarbonate	1.21
		Average	**1.22**
Sediment	Fibre	Polypropylene	0.91
		Average	**0.91**
	Fragment	Polyvinyl chloride	1.4
		Average	**1.4**
	Film	Polystyrene	1.005
		Polypropylene	0.91
		Polyethylene	1.2
		Average	**1.04**
Stair-step moss	Fibre	Polyester	1.37
		Average	**1.37**
	Fragment	Polystyrene	1.005
		Polypropylene	0.87
		Average	**0.94**
	Film	Polystyrene	1.005
		Average	**1.005**

Table S8. Count of microplastics per liter quantified in in field blank (FB: Field blank; n = 5) using the net method.

Shape	**Fibre**			**Film**		**Fragment**		
Colour	*Black*	*Clear*	*Green*	*Blue*	*Clear*	*Blue*	*Clear*	*White*
FB #1	2	0	0	0	3	3	2	2
FB #2	0	1	1	0	2	2	1	1
FB #3	0	0	0	0	0	1	0	5
FB #4	0	1	0	0	2	11	1	1
FB #5	0	0	0	2	6	0	1	0
FB Average	**0.4**	**0.4**	**0.2**	**0.4**	**2.6**	**3.4**	**1**	**1.8**

Table S9. Count of microplastic shapes (i.e., fibres, films, foams, and fragments) in lake water across all sites on Baffin Island, Nunavut (n = 19).

SiteID	Volume	Fibers	Fragments	Films	Foams
	L	#	#	#	#
IQ-12	150.3	1	6	12	1
IQ-14	149.8	22	0	0	0
IQ-15	150.4	3	7	0	0
IQ-17	151.0	4	7	8	1
IQ-20	150.6	1	26	21	0
IQ-21	150.2	5	25	43	35
IQ-22	150.3	4	32	0	0
IQ-23	150.3	2	17	2	1
IQ-24	150.7	1	19	16	1
IQ-25	150.3	8	134	12	4
IQ-34	151.0	9	18	7	7
IQ-42	150.0	3	100	31	26
IQ-43	150.4	27	53	38	21
IQ-45	151.0	4	53	22	42
IQ-46	150.3	5	23	23	0
IQ-49	149.2	117	37	37	1
IQ-50	150.4	3	38	5	1
IQ-52	150.2	5	15	5	3
IQ-65	150.7	9	135	23	1

Table S10. Count of microplastic shapes (i.e., fibers, films, foams, and fragments) in lake water across all sites on Baffin Island, Nunavut (n = 19). *: Indicates sites where the average volume of water was recorded.

Site ID	Volume	Fibers	Fragments	Films
	L	#	#	#
IQ-12	7.8*	16	0	0
IQ-14	7.8*	5	0	1
IQ-15	7.8*	7	2	1
IQ-17	7.8	9	2	1
IQ-20	7.8*	36	3	1
IQ-21	7.8*	3	0	1
IQ-22	7.8*	4	1	0
IQ-23	7.8*	3	1	0
IQ-24	7.7	1	1	0
IQ-25	7.8	5	0	0
IQ-34	7.6	2	1	0
IQ-42	7.9	1	1	1
IQ-43	7.7	11	0	0
IQ-45	7.9	9	0	0
IQ-46	7.8*	5	0	2
IQ-49	7.8*	10	2	1
IQ-50	7.8*	17	1	2
IQ-52	7.8*	21	2	2
IQ-65	7.8*	30	2	6

Table S12. Density (gram per cubic meter; g/cm^3) of polymers used to determine mass concentrations of microplastics (fibers and fragments) in Chapter 5.

Microplastic Shape	Polymer type	Density
		g/cm^3
Fibre	Polyester	1.37
	Polyacrylate	1.05
	Polypropylene	0.91
	Polyvinyl ether	1.04
	Average	**1.10**
Fragment	Polyester	1.37
	Polyvinyl ether	1.05
	Polyurethane	0.875
	Average	**1.10**

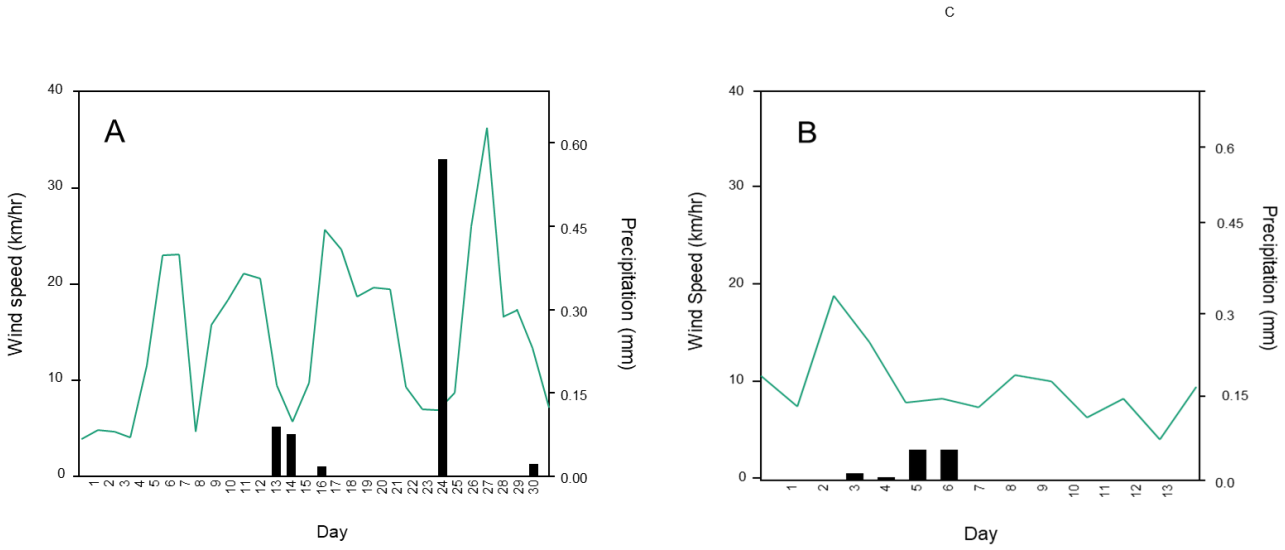

Figure S1. Wind speed (km/hr, blue line) and precipitation (mm, black bars) for A) June 2022 and B) July 2022 prior to sampling period in Iqaluit, Nunavut. Data obtained from Iqaluit Climate Air Monitoring Station.

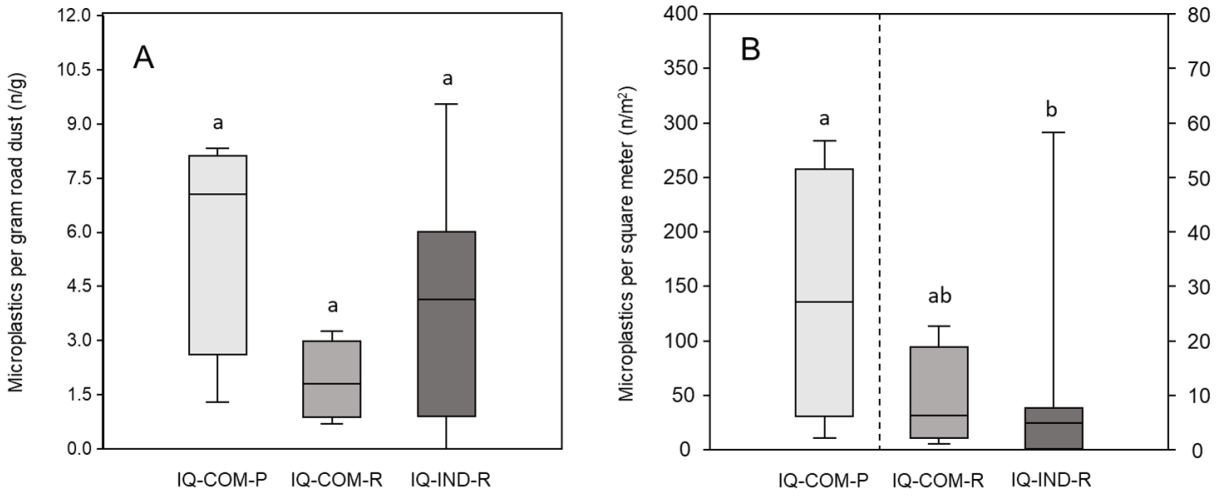

Figure S2. A) Microplastic counts per gram road dust (n/g) and B) microplastic counts per square meter (n/m^2) across commercial parking lots (IQ-COM-P; n = 4), commercial roadsides (IQ-COM-R; n = 4), and industrial roadsides (IQ-IND-R; n = 8). The box represents the 25th and 75th percentile, the horizontal line represents the median and the whiskers represent the interquartile range. Lowercase letters indicate statistical significance (Kruskal–Wallis, $p < 0.05$).

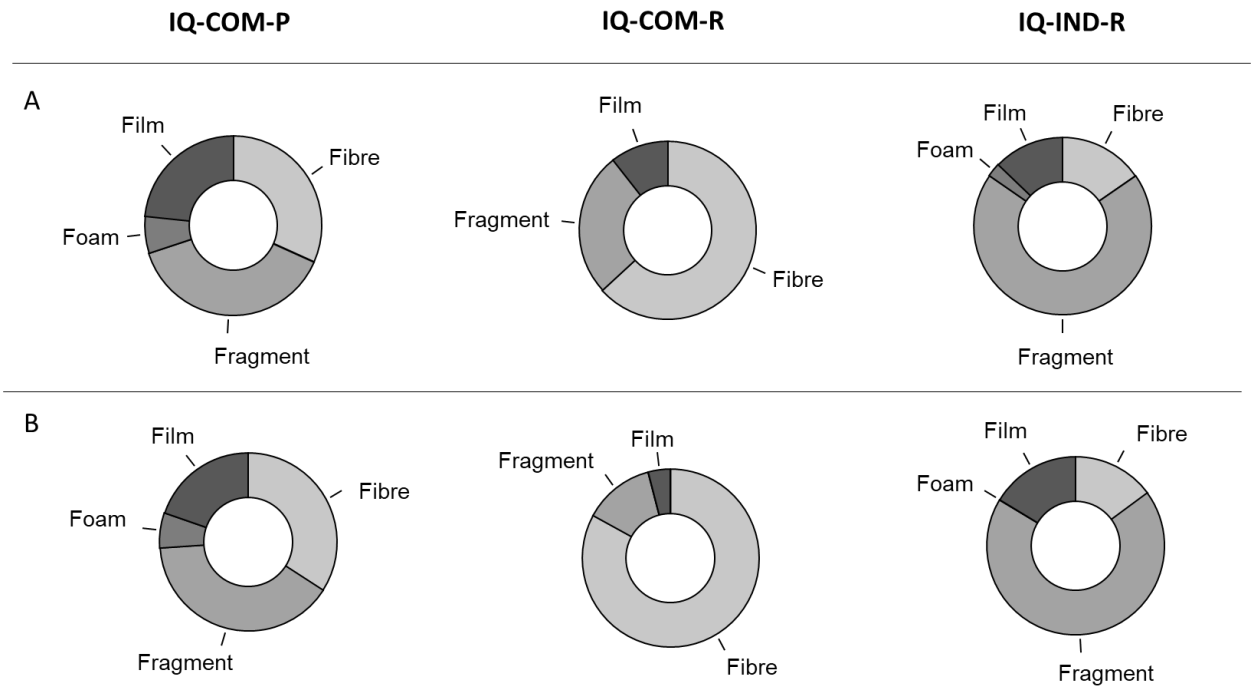

Figure S3. Donut charts showing the proportion of microplastic shapes identified A) per gram road dust (n/g) and B) per square meter (n/m^2) across commercial parking lots (IQ-COM-P; n = 4), commercial roadsides (IQ-COM-R; n = 4), and industrial roadsides (IQ-IND-R; n = 8) in Iqaluit, Nunavut.

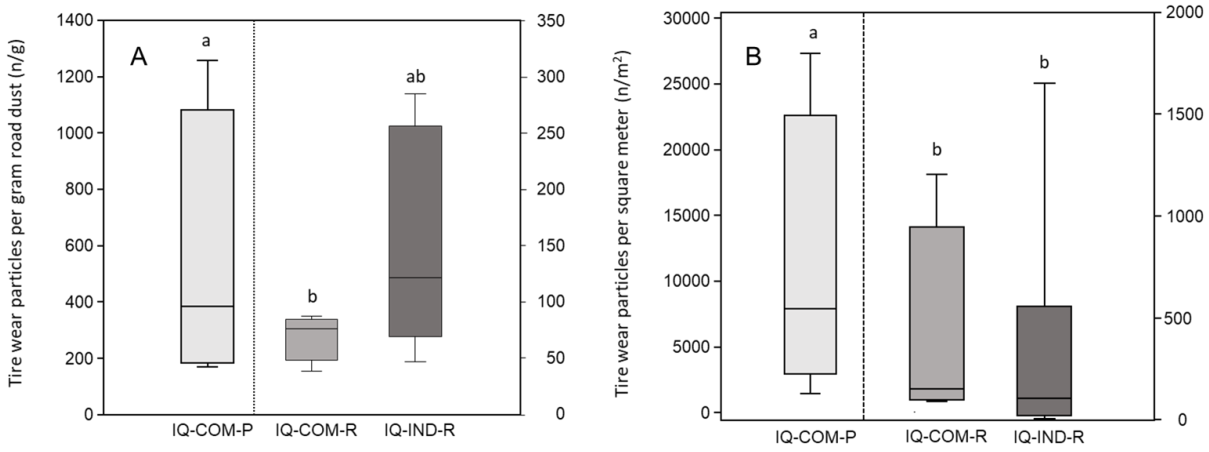

Figure S4. A) Tire wear particle counts per gram road dust (n/g) and B) tire wear particle counts per square meter (n/m^2) across commercial parking lots (IQ-COM-P; n = 4), commercial roadsides (IQ-COM-R; n = 4), and industrial roadsides (IQ-IND-R; n = 8). The box represents the 25th and 75th percentile, the horizontal line represents the median and the whiskers represent the interquartile range. Lowercase letters indicate statistical significance (Kruskal–Wallis, $p < 0.05$).

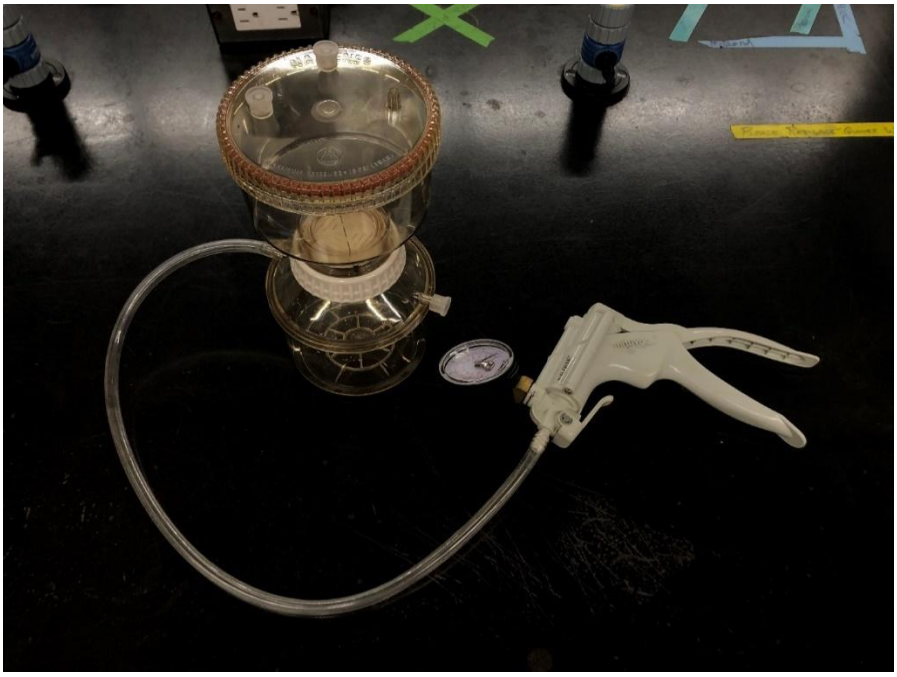

Figure S5. Photo of Nalgene filtering apparatus and hand pump used to filter water samples (Kelly Evans, 2023).

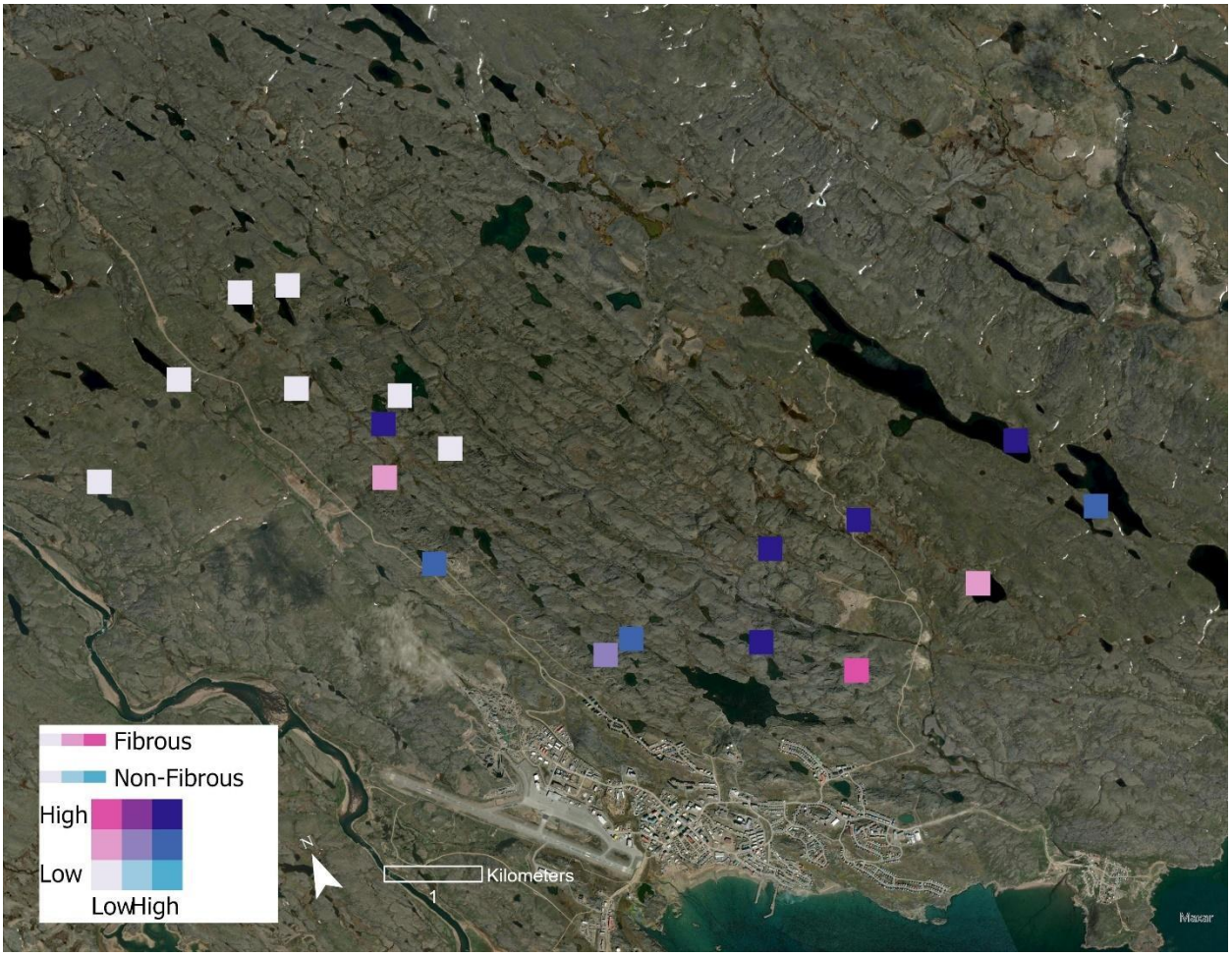

Figure S6. Map showing the proportion of fibrous and non-fibrous microplastics in lake water (n = 19) surrounding Iqaluit, Nunavut. Map made in ArcGIS Pro (Version 3.1.1) by Kelly Evans.

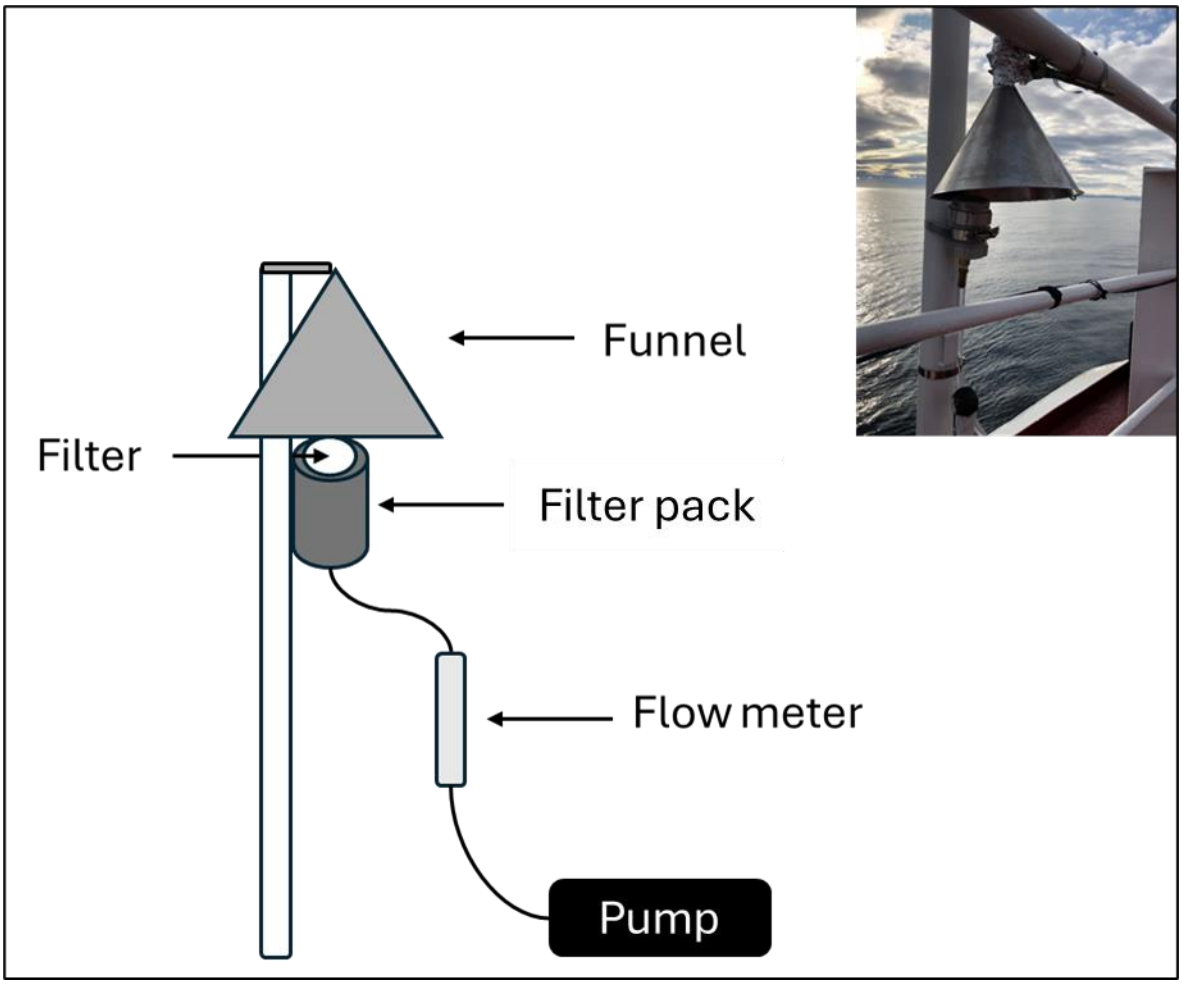

Figure S7. Schematic of the NILU air sampler set-up.