Supporting Information

Microplastics in Freshwaters and Drinking Water: Critical Review and Assessment of Data Quality

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Table S1: Study Characteristics

Reference	Country	Source	Treatment	Sampling Date	Size, shape	Polymers, chemicals	Value	Detection limit, negative and positive controls and blanks.	Sampling method	Analysis method	Comments
Anderson et al. 2017	Lake Winnipeg, Canada	LAK	n.a.	Jul 2014 - Jun 2016	Fibres, fragments, film and foam (pellets not found).	n.i.	Mean: 193 420 (±115 567 SD) #/km^2 Range: 52 508 – 748 027 #/km^2	DI water blanks (quadruplicates, 480L). Air blanks for 24h. Corrected for both blanks.	Manta trawl; 333 µm mesh. Preserved in 70% ethanol.	Samples rinsed and large objects removed; WPO treatment with Fe(II), heated to 75 °C; visual inspection of subsamples for plastics; subset of particles identified with SEM-EDS.	
Baldwin et al., 2016	Great Lake tributaries, US	RIV	n.a.	Apr 2014 - Apr 2015	Size: 0.355-0.999, 1.00-4.759, ≥4.75 mm; Shape: Fragments, pellets/beads, lines/fibers, films and foam.	n.i.	Mean: 4.2 x 10^{-3} #/L; Median: 1.9 x 10^{-3} #/"L; Range: 0.05 - 32 (x10^{-3}) #/L	Five negative controls in the field and 11 in the lab were included.	Neuston net (333 µm). Sample volume measured. . Net rinsed with tap water or filtered (333 µm) stream water. Mesh cod content transferred to glass jars with spoon and tap water. Preserved in isopropyl alcohol.	Sieving through 4.75, 1.00 and 0.355 mm mesh. WPO with Fe(II) catalyst at 75°C). WPO solution sieved through 125 µm and MP visually identified under dissection microscope (40x).	
Browne et al. 2011	West Hornsby and Hornsby Heights, NSW, AU	WWTP	3° treatment	2010	n.i.	PEST, PMMA and PA	EF mean: 1 #/L	n.i.	Samples collected in glass bottles with metal caps.	Filtered and identified with Transmittance FT-IR	

Cable et al. 2017	Lakes Superior, Huron, Eerie and St. Clair, USA	LAK	n.a.	May - Aug 2014	Size: >4750, 4750-1000 and 106-1000 µm. Shape: For > 1000 µm: fragment, film, foam, line, nurdle, sphere, paint or fibre. For 106-1000 µm: fragment or fibre.	n.i.	Mean: 465 606 (± 403 378) #/km^2 (106-1000µm); 32 219 (± 73 576) #/km^2 (1000-4750 µm); 3 503 (± 12 766) #/km^2 (>4750 µm). Range: 126 933 – 1 910 562 #/km^2	n.i. Negative controls (n = 3) included.	Manta trawl; 100 µm mesh. Triplicate trawls, for 20 min.	All size classes: 10% sodium dodecyl sulphate at 50 °C, size fractioned. 106-1000 µm: incubated with proteinase, cellulase, and chitinase, followed by incubation with 30% H_2O_2, followed by WPO treatment. Visual sorting with stereo dissecting microscope. Small subset analysed with SEM-EDS.	Focus on avoiding contaminatio n, including SEM-EDS to generate library of signatures of potential confusing items, and of suspected plastic and suspected non-plastic particles
Carr et al. 2016	Los Angeles, US	WWTP	2° & 3°	June 2014 - Jan 2015	Size: (20), 45, 180, 400 µm. Shape: spheres, fragments and fibres.	n.i.	(1) Skimming Tertiary EF: 3-23 MP in 9.46-9.57 × 10^6 L skimmed; (2) Secondary EF: 1 MP in 5.68 × 10^4 L; (3) Final EF: 0 MP in 1.89 × 10^5 L	n.i.	Method 1: EF sieved through stacked stainless steel sieves (400, 180, 45 and only 2 events used 20 µm). Flows-11.4-22.7 L min^{-1}. Method 2: Skimmed final effluent outfall with surface filtering assembly. Collected sample until clogging.	Tertiary EF: Centrifuging at 4000 RPM for 20 min. Secondary EF: subsamples of 5mL in gridded petri dish, 20% of total sample. Skimming: digestion with bleach. All samples were examined under microscope and checked with a micro-spatula. Some MPs analysed with ATR-FTIR.	
Di et al. 2018	Three Gorges Reservoir, CN	RIV	n.a.	Aug 2016	Size: <0.5, 0.5-1, 1-2, 2-3, 3-4 mm; Shape: Fibre, fragment,	PS, PP, PE, PC, PVC, VC/VAC; Nonanoic acid, 4-aminobenzoic acid, p-tolualdehyde, pth-methionine	Mean (s.d.): 4.703 (± 2.816) #/L; Range: 1.597-12.611 #/L	n.i.	Pumped 25L of water from 1m depth (2 reps) and filtered through 48 µm sieve. contents washed into jar using pure water, samples fixed in 5%	Digestion with H_2O_2. Solution filtered through 0.45 µm and dried at 50°C. MP visually inspected under a dissecting microscope. Subset	

					pellet, film and styrofoam.				formalin and stored at 4°C.	analyzed with micro-Raman spectroscopy and SEM.	
Dris et al. 2015	Seine-Centre WWTP, Paris, France	WWTP	2° treatment	8-10 April 2014	Size: 100-500 µm, 500-1000 µm, 1000-5000 µm. Shape: Fibre	n.i.	IF: mean 293 (range: 260-320) #/L EF: mean 35(range: 14-50) #/L	Blanks included, # fibres negligible.	Collected with automatic sampler and 24-h average samples analysed. A 0.05L aliquot was analysed.	Samples filtered on filter (1.6 µm) and particles counted with stereomicroscope (16x).	
Dris et al., 2015	River Seine, River Marne, Paris, France.	RIV	n.a.	26 June, 17 July, 3 December 2014	Size: 100-500 µm, 500-1000 µm, 1000-5000 µm. Shape: Fibre	n.i.	Plankton net: mean 30 (range 3 – 106) 10^{-3} #/L. Manta trawl: mean 0.35 (range 0.28 – 0.45) 10^{-3} #/L.	Blanks included, # fibres negligible.	Plankton net (80 µm mesh) for 1 min. Manta trawl (330 µm mesh) for 15 min.	Samples filtered on filter (1.6 µm) and particles counted with stereomicroscope (16x).	
Dris et al. 2018	Seine River, Marne River, Paris, France	RIV	n.a.	Apr 2014 – Dec 2015	Size: 50 – 5000 µm.	PET, PP, PA, PET-PUR (and cellulosic fibres).	Concentration means and ranges at 5 sites (10^{-3} # / L): 100.6 (5.7-398.0), 48.5 (2.7-441.4), 27.9 (3.2-92.2), 27.9 (2.4-156.6), 22.1 (1.0-85.0).	Blanks included, # fibres negligible.	Plankton net with mesh size 80 µm; triplicate sampling under bridges for 1 min.	Digestion with SDS, biozyme and H2O2 (Mintenig et al. 2014); Density separation with $ZnCl_2$ (>1.6 g cm^{-3}). Sorting with stereomicroscope. Small subset of fibres checked with micro-FTIR spectroscopy.	
Dyachenko et al. 2017	East Bay Municipal Utility District, California, US	WWTP	2° treatment	n.i.	Size: 5-1 mm, 0.355 - 1mm, 0.125-0.355 mm; Shape: Fibre, film, foam, fragment, pellet.	Polyacrylic, PP, PE	Max: 24-hour sampling- 0.02 #/L; 2-hour sampling- 0.17 #/L.	P.C. for PS, 87% recovery, no replicates.	Effluent flow filtered through 5, 1, 0.355 and 0.125 mm stacked sieves. Flow of 1 gal/min for 24 hours. or 2-hour composites at peak flow. Sieve contents transferred with DI water into	WPO with $FeSO_4$ catalyst at 70°C. WPO solution filtered through 0.8 µm. Examined with dissecting microscope (45X). Micro- FTIR for most commonly observed particles.	No concentrations mentioned, no volumes, random particle identification

									glass jars and stored at 4°C.		
Eriksen et al., 2013	Laurentian Great Lakes, US	LAK	n.a.	11 - 31 Jul 2012	Size: 0.355-0.999, 1.00-4.759, ≥4.75 mm; Shape: Fragment, pellet, line, film and foamed PS.	n.i.	Mean: 43157 #/km^2; Range: 0 - 466305 #/km^2.	n.i.	Manta trawls (333 µm) deployed for 60 min. Tow speed noted. Preserved in 70% isopropyl alcohol.	Samples rinsed in salt water and sieved through 4.75, 1.00 0.355 mm mesh. <1mm particles analysed with SEM. Plastic sorted under a dissecting microscope.	
Estahbanati et al. 2016	Raritan River, New Jersey, USA	RIV	n.a.	Oct - Nov 2015	Size: 63 – 125, 125 – 250, 250 – 500, 500 – 2000 µm.	n.i.	Mean for 125-2000 µm: upstream WWTP: 24 (±11.4) 10^{-3} #/L; downstream WWTP: 71.7 (± 60.2) 10^{-3} #/L.	N.C. DI water over plankton net, values not included. P.C. spiked PE over plankton net, recoveries reported.	Plankton nets (mesh size 153 µm) deployed for 1h.	Nets rinsed with DI 3x. Sieves 4000, 2000, 500, 250, 125 and 63 µm. Particles > 2000µm discarded. Dried at 90°C, WPO with Fe(II) digestion at 75°C. Density separation with sodium chloride (density unknown). Visual inspection with reflected microscope. At least ¼ counted.	.
Faure et al. 2015	Lakes Geneva, Constance, Neuchâtel, Maggiore, Zurich, and Brienz, Switzerland. River Rhone, Aubonne,	LAK, RIV	n.a.	Jul – Oct 2013	Size: 300 – 5000 µm. Shape:Fragments, pellets, beads, lines, fibres, films, foams.	Polymers: PE, PP, PS; Contaminants: PCBs, OCPs, PAHs, PBDEs, BPA, nonylphenol, and phthalates	Lakes: Mean 91 000 (±120 000) #/km-2 or 26 000 (33 000) mg/km2. Median: 48 000 #/km^2 or 8 500 mg/km2.	n.i.	Manta trawl; 300µm mesh. Mean volume: 360 m^3.	Plastics were visually detected in samples with stereomicroscope; 375 (all 169 macroplastic, 206 (10% of total) of microplastics) were analysed with ATR FTIR; the same	Also included macroplastic (> 5000 µm).

	Venoge, Vuachère.						Rivers: Mean 7.0 (± 0.20) 10^{-3} #/L. Median: 0.36 10^{-3} #/L			samples were used for chemical analysis to determine pollutants.	
Fischer et al. 2016	Lake Bolsena and Lake Chiusi, Apennines, IT	LAK	n.a.	18-27 Aug 2014	Size: 0.3-0.5, 0.5-1.0 and 1.0 - 5.0 mm; Shape: Fragments/spherules and fibres.	n.i.	Mean: 2.49 x 10^{-3} #/L; Range: 0.82-4.41 x 10^{-3} #/L	n.i.	Manta trawl (300 μm) sampling for 60 min. Cod end contents transferred to glass bottle, preserved with ethanol and stored in cool, dark place.	Sieved with 1, 0.5 and 0.3 mm mesh sizes. Density separation with NaCl (1.2 g/cm3). Hot digestion with HCl at 70°C. Samples filtered and stained with Nile red. UV-microscope. Subset of fibres verified with SEM.	
Free et al. 2014	Lake Hovsgol, MN	LAK	n.a.	19-26 Jul 2013	Size: 0.355-0.999, 1.0-4.749, >4.75 mm; Shape: Fragment, foam, line/fibre, pellet and film.	n.i.	Mean: 20 264 #/km^2; Range: 997 – 44 435 #/km^2	n.i.	Manta trawl (333μm), for 60 minutes. Storage in 70% ethanol.	Sieved through 0.335, 1.0 and 4.75 mm mesh. WPO with Fe(II) catalyst. Density separation with salt (1.62 g/ml). Visual identification with light microscope.	
Hendrickson et al. 2018	Western Lake Superior, US	LAK	n.a.	15 Aug2016 – 5 Jul 2017	Shape: Foam, bead/sphere, fragment, fibres, film	PVC, PP, PE, PET, CPE, PS, PDMSand dodecyl phthalate resin	Mean (s.d.): 37 000 (27 000) #/km^2 (1 200 mg/km^2); Range: 0 - 110 000 #/km^2 (91 – 3 538 mg/km^2)	D.L.: Three times the average dev. of method blanks (5 particles/100 mL). N.C. duplicated air and replicate method blanks. P.C. in duplicate.	Manta trawl (333 μm), with flowmeter. On-site sieving with 4 mm and 250 μm mesh. Contents <4 mm transferred to glass container with forceps and rinsing. Stored in cool, dark place. Considered ambient contamination.	Dried at 90°C. WPO with Fe^{2+} at 75°C. Density separation with 5 M NaCl. Supernatant filtered and dried at RT or 90°C. Microscopy identification (40x) by two people simultaneously. Hot needle test. 10% of sorted particles were analysed with Pyrolysis GC-MS. If particles were big	Detailed QA/QC procedures and accounted for detection limit. Units not convertible. Minimum concentrations reported in different units is not logical (0

										enough ATR-FTIR analysis was conducted prior to Pyrolysis GC-MS.	#/km^2 and 91 mg/km^2).
Hoellein et al. 2017	North Shore Channel, Lake Michigan, Wilmette, IL, US	RIV	n.a.	7 Aug 2014	Shape: Foam, film, fibre, fragment, pellet	PP, PS, PE	Range: 3.36 - 6.42 (x10^{-3}) #/L	N.C. included DI water, corrected for.	Neuston net (333 µm). 4 replicates in 2 net deployments. Contents from net stored in acid washed containers.	Sieved through 4.75 and 0.3 mm mesh. Samples dried for 72h at 60°C. WPO with Fe(II) at 75°C. Density separation (6M NaCl). Filtered supernatant (0.7 µm) and dried at 60°C. Visual inspection with dissecting microscope (sub-counted fibres), Rep. samples analysed with Pyrolysis-GCMS.	S.I. mentions ipstream: 2.8 (0.5) (x10^{-3}) #/L
Kosuth et al. 2018	CU, EC, UK, FR, DE, IN, ID, IE, IT, LB, SK, CH, UG, US	TAP	17 out of 159 samples : Filtered; 8 out of 159 samples: CL.; 134 out of 159 samples: Treatment not mentioned.	Jan-Apr, 2017	Shape: Fibres, fragments, film	n.i.	Mean: 5.45 #/L, Range: 0-61 #/L	N.C. (n = 30) included and corrected for.	Ran tap for 1 min, then flushed 500 ml HDPE bottle 2x (with sample), then sampled 457-603 ml (partly volunteers)	Filtration through 2.5 µm. Filtrate filtered again. Rose Bengal staining and visual identification with dissection microscope. Durability test with micro spatula.	

Lahens et al. 2018	Saigon river, VN	RIV	n.a.	Dec 2015 - Apr 2016	Fibres (bulk)50-4850 µm. Fragments (net): > 300 µm.	PET, PE, PP, PP, PS, PA, PVC, PE-PP copolymer, PP-vistalon, acrylic, polyepoxy, polyester, PE-ethyl acrylate	Fibres: 172-519 #/L (bulk sample), Fragments: 0.01 - 0.223 #/L (net).	n.i.	Fibres: 300 mL bulk sampling using bucket. Fragments: 300 µm mesh size net for 60 s, combined with a flowmeter. Contents transferred into glass container.	SDS for 24 h at 70 °C, enzyme digestion for 48 h at 40°C, H_2O_2 digestion for 48 h at 40°C. Density separation with $ZnCl_2$ (1.6 g/cm^3). Filtration (2.7 µm) and microscopic inspection with image analysis software.76 fibres (10%) and 57 fragments (15%) were analysed by ATR FTIR.	Macroplastic was assessed too but not included in this scoring
Lares et al, 2018	Launialanselkä Basin, Lake Saimaa, FI	LAK	n.a.	10th Oct 2016 – 2nd Jan 2017	Size: <0.25mm, 0.25-5.0mm, >5.0mm Shape: Particles, fibres.	PES, PE, PA, PP	Average: 0.3 ± 0.1 (S.E.) #/L	N.C. included	Grab sampled 18.5-30.0L water at a location 100 m away from WWTP effluent outlet with a 10-L stainless steel bucket and poured over 2 sieves (0.25 and 5.0 mm).	Samples dried at 75°C in oven for at least 40h until dryness. WPO with Fe(II) heated to 75°C. Samples were vacuum filtration with cellulose nitrate filter, porosity (0.8 µm) and glass fibre filters (1.5 µm) at the bottom. Filters dried for 24h at room temperature covered with aluminium foil. Samples examined under digital optical microscope and classified representative samples (1.3-1.4% of overall particles) under FITR/Raman.	

Lares et al. 2018	Kenkäveron niemi, Lake Saimaa, Mikkeli, FI	WWTP	3° treatment	10 Oct 2016-2 Jan 2017	Size: <0.25mm, 0.25-5.0mm, >5.0mm Shape: Fibres and particles. Surface: Dull	PE, PA, PP	Mean IF: 57.6 ± 12.4 (S.E.) #/L Mean EF: 1.0 ± 0.4 (S.E.) #/L.	Blanks included.	Grab sampled 4.0-30.0 L of IF and EF with 10-L stainless steel bucket and poured over 2 sieves (0.25 and 5.0 mm). Residues transferred with DI water in beakers and sealed with aluminium foil and rubber band for transfer to lab. Stored at 4°C in the dark.	Samples dried at 75°C in oven for at least 40h until dryness. WPO heated to 75°C. IF samples treated with cellulase for 24h at 40°C with 160 rpm shaking. Samples were vacuum filtrated with cellulose nitrate filter, porosity (0.8 µm) and glass fibre filters (1.5 µm) at the bottom. Filters dried for 24h at room temperature covered with aluminium foil. Samples examined under digital optical microscope and classified rep samples (1.3-1.4% of overall particles) using micro- FITR/Raman spectroscopy.	
Leslie et al. 2017	Amsterdam, Netherlands	Canal	n.a.	2012-2013	Size: 10-300 and 300-5000 µm; Shape: Fibres, spheres and foils.	n.i.	Mean: 100 #/L, Range: 48-187 #/L	N.C. included and corrected for.	Grab sampling with 2 L pre-rinsed (MQ) glass jars. Precautions to prevent contamination in the field	Filtration (0.7 µm) of 50 g or 100 g subsample, and microscopic inspection.	Data table is peculiar.
Leslie et al. 2017	Heenvliet, Amstelveen, Horstermeer, Blaricum, Amsterdam West, Westpoort,	WWTP	n.a.	2012-2013	Size: 300-5000 µm and <300 µm. Shape: Fibres, spheres, foils.	n.i.	IF: 68-910 #/L (mean range) EF= 51-81 #/L (mean range) Median EF: 52 #/L. Range: 9-91#/L	N.C. included and corrected for (2 fibres/blank).	Samples collected in 2L glass jars and stored in dark until analysis.	Samples were homogenized and 100 g aliquots were extracted. Sodium chloride solution was added to sample to saturation point (1.2	Did not report sampling details and WWTP processes and facilities.

	Houtrust, Netherlands									kg L^{-1}) before filtration.	
Magnusson and Noren 2014	Långeviksverket, Lysekil, Sweden	WWTP	Tertiary treatment	2014	Shape: Fibre, fragment and flake.	PE, PP, thermoset plastic based on aliphatic polyester resin.	IF=15.1 ± 0.89 (SE) #/L EF= 8.25 ± 0.85 (SE) 10^{-3} #/L	n.i.	Used a Ruttner sampler for influent and filter holder with tube for effluent. Filter over 300 µm mesh to collect 2 L of IF water per sample (triplicate) and 1000 L of EF per sample (quadruplicate).	Identification with stereo microscope (50x) Suspect fibres were placed on an object glass and heated over the flame of an alcohol burner. Subset of particles were picked out for ATR- FTIR analysis.	
Mani et al. 2015	Rhine river, Switzerland, France, Germany, Netherlands.	RIV	n.a.	Jun - Jul, 2014	Size: 300 – 5000 µm; Shape: Spherules, fragments, fibres, foam.	PS, PP, acrylate, PEST, PMMA and PVC	Mean 892,777 #/km^2; Range: 52 364 -3 931 062 #/km^2	N.C. included for part of process.	Manta net (300 µm) with flowmeter; sampled vol. 60–250 m^3. Samples handled against the wind and stored in tap water-rinsed glass jars and 10% NaCl solution.	Sieved through 5, 1, 0.3 mm mesh. SDS for 24 h at 70°C, enzyme digestion for 3 d at 37 °C, H_2O_2 for 24h at 37°C. Density separation, filtration (300 µm), microscopic inspection and ATR FTIR on 118 particles.	
Mason et al. 2016	USA	WWTP	2° and 3° treatment	Sep 2013 – May 2015	Size: 125-355, >355 µm; Shape: Fragments, pellet, line/fibre, film and foam	n.i.	Mean: 0.05 #/L; Range: 0.004-0.195 #/L; 95% CI: 0.050-0.024 #/L.	N.C. included (7), no particles found.	Pumped effluent through 0.355 mm and 0.125 mm (12-18 L/min, for 2-24 hours). Preservation in 70% isopropyl alcohol.	WPO with Fe (II) catalyst. Sieved through 0.125 mm and transferred to petri dish. Microscopic inspection (40x).	
Mason et al., 2016b	Lake Michigan, US	LAK		17 Jun-20 Aug 2013	Size: 0.355-0.999, 1.00-4.759, ≥4.75 mm; Shape: Fragments, pellet,	HDPE, LDPE, PP, copolymers	Mean: 17 276 #/km^2; 95% C.I: 12 898-21 655 #/km^2; Range: 0 - 100 016 #/km^2	N.C. included (6), no particles found.	Manta trawl (333 µm) for 30 min. Distance noted. Preserved in 70% isopropyl alcohol.	Sieving through 4.75, 1.00 and 0.355 mm mesh. WPO with Fe(II) catalyst for <4.75 mm particles and filtered again. SEM/EDS analysis for 20% subsamples	

					line/fiber, film and foam.					(0.355-0.999 mm). ATR FTIR analyses for 59% subsamples (>4.75 mm).	
Mason et al. 2018	CN, US, BR, IN, ID, MX, LB, TH	BOT	n.a.	n.i.	Size: 6.5-100, >100 μm; Shape: Fragment, film, fibre, foam, pellet	PP, nylon, PS, PE, PEST (polyester + polyethylene terephthalate), Azlon, polyacrylates, copolymers	Mean: 325 #/L (> 100 μm - 10.4 #/L, < 100μm - 315 #/L); Range: 0-10390 #/L	N.C.: > 100μm - 4.15 (0-14) #/L, 6.5-100 μm - 23.5 (7-47) #/L. D.L. size: 6.5 um. P.C.: included for particles < 100 μm.	259 bottles, 11 brands,27 different lots, 19 locations, 9 countries. 2-3 lots/brand for 10 brands, while 1 brand only had 1 lot. 9/10 bottles/lot (500-600 mL bot vol.); 4/6 bottles/lot (0.750-2 L bot vol.). One glass bottled water lot and others plastic. All bottles had plastic bottle caps.	Processed under laminar flow hood. NR for 30 mins, filtration (1.5 μm). > 100 μm particles: microscopic inspection, ATR FTIR on subsample. 6.5-100 μm particles: NR tagged with software (av. results by 2 researchers). Image analysis validated with positive controls. Workspace wiped, materials rinsed, glassware covered, lab blanks (processed blindly).	Particles <100 μm were acknowledged not to be spectroscopically confirmed to be microplastics, however particles were expected to be plastic or of some other anthropogenic origin.
McCormick et al., 2014	North Shore Channel, Chicago, IL, US	RIV	n.a.	13 Sep 2013	Size: 0.330-2 mm; Shape: Fragment, pellet, foam and fiber.	n.i.	Mean (SE): Upstream WWTP- 1.94 (0.81) x 10^{-3} #/L, Downstream WWTP - 17.93 (11.05) x 10^{-3} #/L.	Negative controls (n = 4): 4.5 ± 1.2 (mean ± SE) fibers/sample	Neuston net (333 μm) with flow meter deployed for 20 min. Rinsing of net with unfiltered site water, stored in Nalgene containers at 4 °C.	Sieving through 2 mm and 330 um mesh. Dried at 75°C. WPO with Fe(II) catalyst at 75°C for 48 h. Density separation with NaCl. Microscopic inspection (15% subsample).	
McCormick et al. 2016	NE Illinois, Central Illinois and NW Indiana, US	RIV	Cl, de-Cl, UV, SF	10 Jul-13 Oct 2014	Size: 0.330-4.75 mm; Shape: Pellets, fibres, fragments, foam, film	PE, PP, PS, ethylene	Mean (SE): Upstream - 2.355 (0.375) x 10^{-3} #/L ; Downstream - 5.733(0.850) x 10^{-3} #/L;	N.C. (n=5).: 4.67 fibres/sample	Neuston net (333 μm) with flow measurement for 15-20 min. Rinsing of net with unfiltered site	Sieving through 4.75 and 0.330 mm. Dried at 75°C. WPO with Fe (II) at 75°C. Density separation with NaCl (6 M).	

							Range: 0.48-11.22 x 10^{-3} #/L		water and stored in 1L containers at 4 °C.	Filtration (0.7 µm) and microscopic inspection (fibres: 36% subsample). Pyr-GCMS (n=8).	
Michielssen et al. 2016	Detroit and Northfield, US	WWTP	2°and 3°treatment	March 25, 2016; Oct 19, 2015; March 21, 2016	Shape: Fragments, fibres, paint chips, micro-beads	n.i.	Detroit: IF=133.0 ± 35.6 #/L Final EF=5.9 SAL L^{-1}; Northfield: Final effluent = 2.6 SAL L^{-1} AnMBR system Final effluent = 0.5 SAL L^{-1}	N.C. 20L (n = 1, 1 fibre found, not corrected for).	Grab sample in plastic containers cleaned with DI and air dried. Stored at 4C.	Sieved (4.74, 0.85, 0.3, 0.106 and 0.02 mm). Stereo-microscope.	SAL = small anthropogenic litter. Notation slightly confusing (removal or concentration).
Miller et al. 2017	Hudson river, US	RIV	n.a.	n.i.	Fibres	PET, fluoro-polymer/Teflon, PP	Median: 0.98 #/L, minimum: 0.625 #/L	N.C. included, air and water. Corrected for air, water negligible.	Grab samples (3 L from top 8-18 cm), pre-rinsed buckets / jars	Filtered over 0.45µm, filters in metal petri dishes, visual inspection, controls included, micro FTIR analysis	
Mintenig et al. 2017	DE	WWTP	2° treatment (n=8), 3° treatment (n=4)	22-29 April, 2014	Size: <500, >500 µm; Shape: Fibres	PE, PP, PA, PVC, PS, PUR, silicone, paint, SAN, PEST, PET, EVA, PVAL, ABS, PLA.	Range: >500µm: 0 – 40 x 10^{-3} #/L; < 500µm: 10 – 9000 x 10^{-3} #/L	N.C. included and corrected for.	Pumped with filtration (10 µm SS filter) and flowmeter, 10 cm below water surface with pre-rinsing. Filtration unit sealed and stored at 4 °C.,	Enzymatic maceration, SDS at 70 °C for 24 h, enzymatic digestion at 40-50 °C up to 6 d. Sonication in MQ for 3 mins. Filtration (500 µm). <500 µm: WPO at 50 °C for 24 h and chitinase at 37 °C for 48 h and repeat WPO. Density separation with $ZnCl_2$ (1.6 g/cm^3), filtered (0.2 µm) and dried at 40 °C. FTIR imaging analysis (25%).	

										>500µm: Microscopic inspection and ATR-FTIR analysis for all particles. 60 fibres/sample analysed with FTIR imaging.	
Mintenig et al. 2019	Germany	GROUND	None (raw water)	13-20 Aug 2014	Size: 50 – 150 µm; Shape: fragments	PEST, PVC, PA, EPOXY resin, PE (relates to raw and tap water)	Mean: 0.7 x 10^{-3} #/L; Range 0 – 7 × 10^{-3} #/L	Size d.l. > 20 µm. N.C. included and corrected for.	Extracted from wells at > 30 m depth. Filtered over 3 µm steel cartridge filters in housings from SAN and PP, at a flow of 5 L/min, volume 300 – 1000 L. Filtration until clogging. Pre-rinsing with Milli-Q. Samples stored at 4°C.	0.01 M HCl treatment to remove $CaCO_3$ and Fe-precipitates, then Milli-Q and 30% ethanol. Then 24 h WPO (35%) at 40°C and filters dried at 40°C. FTIR-imaging applied to 100% of the filter but for particles only. Fibres were not identified.	
Mintenig et al. 2019	Germany	TAP	Filtration / aeration of groundwater	13-20 Aug 2014	Size: 50 – 150 µm; Shape: fragments	PEST, PVC, PA, EPOXY resin, PE (relates to raw and tap water)	Mean: 0.7 x 10^{-3} #/L; Range 0 – 7 × 10^{-3} #/L	Size d.l. > 20 µm. N.C. included and corrected for.	Per consumer household: sampled at the water meter and at the conventional tap. Filtered over 3 µm steel cartridge filters in housings from SAN and PP, at a flow of 10 L/min, volume 1200 – 1500 L. Pre-rinsing with Milli-Q. Samples stored at 4°C.	0.01 M HCl treatment to remove $CaCO_3$ and Fe-precipitates, then Milli-Q and 30% ethanol. Then 24 h WPO (35%) at 40°C and filters dried at 40°C. FTIR-imaging applied to 100% of the filter but for particles only. Fibres were not identified.	
Murphy et al. 2016	River Clyde, Glasgow,	WWTP	3°treatment	n.i.	Size: 0.598 ± 0.089 mm.	PMMA, alkyd, PET, PA, polyaryl ether, PEST, PE,	Mean (#/L): (1) IF- 15.70 ± 5.23 (SD or SE?); (2)	N.C. included, but not considered	Grab sampling with 10 L steel buckets and	Vacuum filtration with 11 µm filter paper. Subset (4/24th)	

	Scotland (UK)				Shape: Flakes, fibres, film, beads and foam.	PP, PS, PUR, polvinylfluride, PS acrylic, PVA, PVC, PVE	Grit and grease- 8.70 ± 1.56; (3) Primary EF- 3.40 ± 0.28; (4) final EF: 0.25 ± 0.04. (SD or SE?)	and insufficient reported.	sieved with 65 µm mesh. Vol. sampled: (1) IF- 30 L; (2) EF-50 L.	of each filter paper analysed for particle count. Subset polymer identification using micro-FTIR.	
Oßmann et al. 2018	Bavaria, DE	BOT	n.a.	n.i.	Size: ≤1.5, 1.5-5, 5-10, >10 µm	PTFE, Poly(p-phenylenterephthalamid, PS, PP, PE, PET+Olefin, PS + Olefin, PET, PVC, PA, Poly(diallylisophthalat), polyester, styrene-butadiene-copolymer, tris(2,4-di-tert-butylphenyl)phosphite	PET: Mean 2649 ± 2857 #/L (single-use), 4889 ± 5432 #/L (reusable); Range 90 – 16634 #/L Glass: Mean 6292 ± 10521 #/L; Range 813 – 35436 #/L	N.C. included (one blank per analysis block). 7 blanks in total, on average 384 +/- 468 particles/L found. P.C. and D.L. not mentioned.	32 samples from 21 brands purchased in Bavarian food stores. 12 reusable PET bottles (both newish and frequently reused), 10 single-use PET bottles, 9 reusable glass bottles and 1 single-use glass bottle. Volume per sample: 0.5 – 1.0 L. Targeted small particles (≥ 1 µm).	Labels removed, bottles cleaned with detergent, rinsed with DI water and dried in laminar flow box. Sample mixed by inverting bottle and transferred to cleaned flask and added EDTA. Then SDS was added and 250 ml aliquot of the solution was filtered through Al coated PC 0.4 µm membrane filter. Funnel of filtration unit rinsed with ethanol to remove foam and then UP water. Filters immobilized with metal rings and microscope slide, then identified with micro-Raman spectroscopy (4.4% filter area).	
Pivokonsky et al. 2017	CZ	DWTP	WTP1: Coagulation, flocculation, SF; WTP2: sedimentation, SF and GAC	Nov 2017-Jan 2018	Size: 1-5, 5-10, 10-50, 50-100, >100 µm; Shape: Fibre, spherical, fragment	PET, PP, PE, PS, PAM, PAM, PBA, PVC, Bakelite, PMMA, PPTA, PTT, DEHP	Raw: Range 1473 ±34 – 3605 ± 497 #/L Treated: Range 338 ±76 – 628 ±28 #/L	Triplicate negative controls for each set of samples (per sampling day)	1 L sample stored in pre-cleaned borosilicate glass bottles at 4°C.	WPO treatment with Fe(II), heated to 75 °C; Filtered through 5 µm then 0.2 µm PTFE (SEM analysis) and Al_2O_3 (FTIR)	

			filtration; WTP3: Coagulation-flocculation, flotation, SF and GAC filtration							membrane filters and dried at 30°C for 30 mins. SEM analysis performed on 3 x (3 x 8 mm cutout). Micro-FTIR spectroscopy performed on >10 µm particles. Micro-Raman spectroscopy performed on 1-10 µm particles. ID on 25% of filter.	
Rodrigues et al. 2018	Antuã River, PT	RIV	n.a.	May, Oct, 2016	Shape: Fragments, pellets, films, foam and fibres	PE, PP, PS, PET, PVA, EVA, PTFE, PMMA, PAE, SBR, cellulose acetate	Range: 0.005-0.0517 mg/L and 0.058-1.265 #/L	N.C. included but amount negligible.	Motor water pump with 0.055 mm mesh net, sampling for 5 min at surface and 5 min at bottom.	Sieves 5 and 0.055 mm, WPO (75°C for 10 min, + 15 h room temperature). Density separation with zinc chloride (density 1.6 g cm^{-3}). Vacuum filtration. Dried at 40°C for 3-5 days. Subsample of particles analysed with ATR-FTIR.	
Schymanski et al. 2018	DE	BOT	n.a.	n.i.	Size: 5-10µm, 10-20µm, 20-50µm, 50 - 100µm, > 100µm	PEST, PE, PP, PA,	Single-use plastic bottles. Mean: 14 ±14 #/L; Range: 2 - 44 #/L. Returnable plastic bottles. Mean: 118 ± 88 #/L; Range: 28-241 #/L. Glass bottles. Mean: 50 ± 52 #/L;	N.C. (n=18): 1-42 plastic particles, mean: 14 ± 13	700 - 1500 ml, total volume of bottle was always used. Replica's: 12 returnable plastic bottles, 10 single use plastic bottles, 3 beverage cartons and 9 glass bottles.	Filtration over pre-counted filter, rinsing with MQ. Analyses with Singel Particle Explorer, u-Raman spectroscopy (1µm smallest particle size).	. SD or SE unknown.

							Range: 4-156 #/L. Beverage cartons. Mean: 11 ± 8 #/Ll; Range: 5-20 #/L				
Sighicelli et al. 2018	Lake Iseo, Lake Maggiore, Lake Garda, IT	LAK	n.a.	Summer 2016	Size: > 300µm; Shape: Fragment, balls, filaments, sheets, pellets.	PE, PP, PS, EPS, PET, Polyurethane, PVC, PEST, Acrylonitrile-Butadiene-Styrene	Lake Iseo. Mean: 40000 #/km^2 Lake Maggiore. Mean: 39000 #/km^2 Lake Garda. Mean: 25000 #/km^2	n.i.	22 trawls, average 6 per lake, and 6-9 additional per lake. Manta trawl with 300µm mesh size and 60x20 opening. Mean of 240 m^3 water.	Manual separation with stereomicroscope. Drying at 50°C, counting, weighing. ATR-FT-IR for 46% subset.	
Simon et al. 2018	DK	WWTP	2° treatment	n.i.	Size: Up to 600 µm	Acrylate, SAN, VAC-PMMA copolymer, PE, PP, PE-PP co polymer, PEST, PS, PUR, PVC, EVA, PA, PVA	Raw wastewater median:: 7216 #/L or 250 ug/L Treated wastewater median: 54 #/L or 4.2 ug/L Recovery efficiency=99.3%	N.C.: triplicate blanks, not accounted for. P.C.: triplicates, not corrected for recovery. D.L. raw waste water: 3093 #/L or 89 µg/L.	Sampled with auto samplers. Raw WW samples filtered on-site through 10 µm stainless steel meshes.	Raw wastewater was wet-sieved with SDS. Sample incubated with cellulase enzyme for 48 h at 40°C then WPO. Reactor was kept in an ice-bath and temperature maintained between 15 and 30°C. 2-6% of homogenized sample transferred on transmission/ reflectance window, all analysed with FTIR-imaging.	

Su et al. 2016	Taihu Lake, CN	LAK	n.a.	Aug 2015	Size: 5-100, 100 - 333, 333-1000, 1000-5000 μm; Shape: Fibres, pellets, films and fragments.	Cellophane, PET, PEST, terephthalic acid, PP	Range: Plankton net-0.01-6.8 x 10^6 #/km^2; Bulk-3.4-25.8 #/L	N.C. included and accounted for.	Plankton net (333 μm) for 1-30 min < 0.3 m deep. 250 mL sample collected and preserved in methyl aldehyde in glass bottle. Bulk surface sample: steel sampler, 5 L pooled sample.	Filtration (net-100 μm, bulk-5 μm). WPO at 65°C for 72 h. Microscopic inspection.Subset (113/1805 particles) analysed with micro-FT-IR or SEM/EDS.	
Talvitie et al. 2015	FI	WWTP	Bar screening, grit removal, pre-aeration, primary sedimentation, activated sludge treatment, secondary sedimentation and tertiary biological filtration	Oct- Dec 2012	Size: 200, 100 and 20μm; Shape: fibres and particles.	n.i.	IF Mean fibres: 180 #/L Mean particles: 430 #/L. Primary sedimentation Mean fibres: 14.2 (± 0.7) #/L Mean particles: 290.7 (±28.2) #/L After secondary sedimentation Mean fibres: 12.8 (± 1.6) #/L Mean particles: 68.6 (± 6.3) #/L EF Mean fibres: 4.9 (± 1.4) #/L Mean particles: 8.6 (± 2.5) #/L	N.C. included (n=?), no plastics found.	Pump, flow rate of 1.0 ml/min. Transparent plastic tubes (60 mm diameter), with 200, 100 and 20μm nets plasticized between connectors of tubes. Sample size: 0.3 - 285L.	Stereomicroscope (x50), identified and counted. particles and fibres. Blanks processed simultaneously	SD or SE?
Talvitie et al. 2017	FI	WWTP	Coarse screening, grit removal, chemical treatment	Sep 2015	Size: 20-100μm, 100-300μm, > 300μm;	PES, polyacryl, PE, PS, PP	EF (general): Range: 0.006 – 0.651 #/L (for different days),	N.C. (n = 3), numbers reported.	1. Grab samples: three replicates, pumping through tubes with 300, 100 and 20μm filter mesh. Sampling	Stereomicroscope (50x). Particles counted, categorized in shapes. FTIR for 3 EF samples. In total	

			and primary sedimentation, active sludge method.		Shape: fibres, fragments, flakes, films and spheres.		or 1.7E6 - 1.4E8 #/day. Grab sample: Range IF: 380 (± 52.2) - 686.7 (±155.0) Range after pre-treatment: 9.9 (± 1.0) - 14.2 (± 4.0) Range after AS: 1.0 (± 0.6) - 2.0 (± 0.2) Range EF: 0.7 (± 0.6) - 3.5 (± 1.3). 24-hour composite sample: Range IF: 390.0-900 Range after pre-treatment: 4.1-23.8 Range after AS: 1.5-2.8, EF: 1.4-2.8, blank: 0.4-0.8.		volume 0.1 l - 1 m^3. IF: beaker because of clogging filters. 2. 24-h composite sample - 15 min intervals over 24-h period, for 3 days in a week. Sampling volume: 0.1 L - 14.5 L. 3. Sequential sampling: 1-h interval samples for 24 hours, pooled per 3 hours with automated samplers.	752 particles, but 18% success rate.	
Talvitie et al. 2017b	FI	WWTP	3°: micro-screen filtration with disc filters, rapid sand	Apr 2014 - Aug 2015	Shape: Fragments, flakes, films and spheres	PES, PE, PP, PS, PU, PVC, PA, acrylamide, poly-acrylate, alkyd resin,	Range before treatment: 6.9 (± 1.0) - 0.5 (± 0.2) #/L,	N.C. (n=3) included, no plastics found.	Three replicates, filter over 300, 100 and 20μm sieves with pump. Also 24-h composite samples.	Visual inspection, followed by an analysis using FTIR imaging for all pre-	Mentioning of "small sample volumes", and how this

			filters, dissolved air flotation, membrane bioreactor.			polyphenylene oxides, ethylene vinyl acetates.	Range after treatment: 0.3 (± 0.1) - 0.005 (± 0.004) #/L,.		Water volume: 0.4 - 1000L.	sorted particles. Blanks included.	leads to false zero results.
The Danish Environmental Protection Agency, 2017	DK	WWTP	n.i.	n.i.	Size IF, median: 50μm Size EF, median: 51.5μm.	Nylon, PE, PE-PP copolymer, PP, and PVC.	IF: Median: 5.9 Mean: 8.0mg/L. EF: Median: 0.016, Mean: 0.034mg/L. IF: Median: 86000, Mean: 127000#/L. EF: Median: 6400, Mean: 5800 #/L.	D.L. IF > 4ug/L, EF > 0.20ug/L, Sludge > 20ug/g. P.C. included, recovery rates mentioned.	IF: 3 times 24h auto sampler. 1L stored in glass jar. EF: 3 times, 10μm filters until clogging of 3 filters (0.5 - 108 L per filter). Sludge: 2 times, 1 kg.	IF: 1mL sodium dodecyl sulphate addition, then 500μm pre-sieved. Cellulose digesting enzyme to 200 mL subsample. Incubation for 48h at 40°C, hydrolysed with H_2O_2. Fractions sieved: > and < than 80μm. From sieves to water + SDS. Filtered over 10μm mesh. Filters in ethanol, sonicated, scraped. 5mL ethanol. EF: the 3 10μm filters were hydrolysed and oxidized like IF. All samples: Micro-FT-IR.	Very concise report.
Vermaire et al. 2017	Ottawa River, CA	RIV	n.a.	Summer 2016	Shape: Microfibres, microbeads, unidentified fragments	n.i.	Bottle sample median: 0.1 #/L. Manta trawl mean 0.00135 #/L	N.C. (n = 11) included and values reported.	Bottle sampling: 100 L over 100μm nylon mesh, triplicate per location. Manta trawls: 100μm mesh, 84-181 m^3 (mean: 128, sd 37 m^3).	WPO at 80°C for 7h. 100μm filter, Leica stereomicroscope 40x.	
Vermaire et al. 2017	Ottawa River, CA	WWTP	n.i.	Summer 2016	Shape: Microfibers, microbeads, unidentified fragments	n.i.	Median EF: 0.07 #/L	N.C. (n = 11) included and values reported.	100 L EF, triplicate. ISCO peristaltic pump, 100μm nylon mesh	WPO at 80°C for 7h. 100μm filter, Leica stereomicroscope 40x.	Lower concentration than surface water (see above)

Wang et al. 2017	Wuhan, CN	LAK, RIV	n.a.	April 2016	Size: 50 - 500μm, 500-1000μm, 1000-2000μm, 2000-3000μm, 3000-4000μm and 4000-5000μm; Shape: Fibre, granule, film and pellet	PET, PP, PE, Nylon, PS	Range: 1.660 ± 0.6391 – 8.925 ± 1.591 #/L.	N.C. for field- and lab work included.	20L pumped over 50μm sieve, in duplicates.	WPO at room temperature, Visual sorting of particles, a subsample analysed with SEM and micro-FTIR spectroscopy (2 particles per location).	Very small sampling volume (20L)
Wang et al. 2018	Dongting Lake and Hong Lake, CN	LAK	n.a.	Sep 2017	Size: 50 – 5000 μm; Shape: Fibre, granule and film.	PE, PP, PS, PVC	Dongting Lake: Mean: 1.19 #/L (> 330 um). Range: 0.900–2.8 #/L (50 – 5000 um) Hong Lake: Mean: 2.28 #/L (> 330 um) Range: 1.25–4.65 #/L (50 – 5000 um).	N.C. (n = 3 per lake) included, number negligible. P.C. included, recovery reported.	20 L of bulk surface water (0–20 cm in depth) collected in twice (10 L per time) using a Teflon pump, filtered through a stainless steel sieve with mesh 50-μm. Residues rinsed into glass bottle with distilled water, preserved in 4% formalin. GPS coordinates.	H_2O_2 at room temperature for 48 h, filtered, microscopic inspection and analysis with micro-Raman spectroscopy, blanks and positive controls included.	

Xiong et al. 2018	Lake Qinghai area, CN	LAK, RIV	n.a.	July 2016	Shape: Sheet, fibre, fragment, foam	PP, PE, PS, PET	Range lake: 0.05-7.58 E5 particles/km^2. Range rivers: 0.03-0.31 E5 particles/km^2 river.	N.C. included (n = ?), not mentioned if corrected for.	Trawl net, 0.112 mm mesh, volume from flow & net size	Sieved over 1mm, density separation with potassium formate, then WPO at 60°C overnight then GF/C filters, visual examination. Analysis was done with micro- Raman spectroscopy. When numbers of sorted particles were < 100 µm, all particles were analysed. For higher concentrations (> 100 particles) 10-15% of particles were analysed.	
Zhang et al. 2015	Three Gorges Reservoir, CN	LAK	n.a.	23 Sep 2014	Size: 112-300 µm, 300-500 µm, 500 µm - 1.6 mm, and 1.6-5 mm; Shape: Fragments, sheets, line, foam.	PE, PP, PS in the form of Styrofoam	Range main stream Yangtze: 3407.7 E3 - 13 617.5 E3 #/km^2 Range estuarine areas of the tributaries: 192.5 E3 - 11 889.7 E3 #/km^2	n.i.	Trawl, 112 µm mesh and 500 ml PE collecting bottle, transferred into 1 L glass bottle. Debris remaining in the net was rinsed with river water into a beaker and transferred into the same glass bottle. All samples preserved with methyl aldehyde and stored at 4°C before analysis.	Samples passed through a 1.6 mm stainless steel sieve. Transferred into 1 L separating funnels. Materials retained on the sieve were examined by naked eye and suspected plastic debris picked out. Samples in the funnel were allowed to settle. Floating debris on the surface transferred to petri dishes, oven-dried at 60°C, and examined using a stereomicroscope, analysis with ATR FTIR.	

Zhang et al. 2017	Xiangxi River, tributary of the Three Gorges Reservoir, CN	RIV	n.a.	April, July, Oct 2015, and Jan 2016.	Size: 0.112−0.5 mm, 0.5−1 mm, and 1−5 mm; Shape: sheet, fragment, lines, and foam.	PE, PP ,and expanded polystyrene (PS)	0.55 E5 - 342 E5 #/km^2	n.i.	Trawl, 112μm mesh, transferred into 1 L glass bottle. Net rinsed 3x with distilled water. All samples preserved with methyl aldehyde and stored at 4°C before analysis.	Samples sieved, 1 mm mesh stainless steel sieve. Visual inspection. Suspected microplastics transferred to petri dishes for examination. Sieved water was collected and transferred into 1 L separating funnel. Density seperation (potassium formate, 1.5 g/mL). Samples in the funnel were allowed to settle overnight, then high density materials discharged. Micro Raman spectroscopy on all suspected microplastic particles	
Ziajahromi et al. 2017	AU	WWTP	WWTP A: 1° treatment; WWTP B: 2° with UV; WWTP C: 3° with Cl, UF, RO	Oct2015	Size: 25-100, 100-190, 190-500, 500 μm; Shape: Irregular, granular and fibre.	PET, nylon, PE, PP, PS,PVC	Effluent: WWTP A- 1.5 #/L,; WWTP B: 0.48 #/L.; WWTP C- 0.28 #/L, (3° treatment),0.21 #/L.	N.C. In = ?) included, no plastics found. P.C. included for part of sampling.	Pumped 3 - 200 L through stacked sieves of 500, 190, 100 and 25 μm at max flow rate of 10 L/min. Mesh screens stored on petri dishes sealed in Al foil.	Rinsed from sieves with UP water, and concentrated to 100 mL by drying at 90°C. WPO at 60 °C and dried. Density separation with NaI (1.49 g/ml). Centrifugation for 5 min at 3500xg. Supernatant filtered over 25 μm mesh and stained with Rose-Bengal solution. Dried at 60 °C for 15 min and microscopic	Method check with PS particles and staining method check with PE and polyester fibres.

										inspection, analysis with ATR FTIR.	

* calculated from reported data

Table S1 (continued): Legend

Abbreviation	Full name
Source	
LAK	Lake
RIV	River
BOT	Bottled water
TAP	Tap water
WWTP	Wastewater treatment plant
DWTP	Drinking water treatment plant
Treatment	
2°	Secondary
3°	Tertiary
SF	Sand filtration
MBR	Membrane bioreactor
RO	Reverse osmosis
DIF	Disinfection
CL	Chlorination
OZ	Ozone disinfection
MF	Membrane filtration
IE	Ion exchange
GAC	Granular activated carbon
Polymer types	
PE	Polyethylene

PEST	Polyester
PVC	Polyvinyl chloride
PET	Polyethylene Terepthalate
PMMA	Poly (methyl) methylacrylate a.k.a. acrylic
PS	Polystyrene
PA	Polyamide
PP	Polypropylene
PC	Polycarbonate
VC	Vinyl chloride
VA	Vinyl acetate
CPE	Chlorinated PE
PDMS	Polydimethylsiloxane
PES	Polysulfone
PVA	Polyvinyl acetate
PU	Polyurethane
SBR	Styrene butadiene rubber
EVA	Ethylene vinyl acetate
PAM	Polyacrylamide
PBA	Polybutylacrylate
Chemicals	
DI	Distilled water
MQ	Milli-Q water
SDS	Sodium dodecyl sulfate
NR	Nile Red
UP	Ultra-pure water
DEHP	Di(2-ethylhecyl)phthalate
PPTA	p-phenylene terephthalate
PTT	Polytrimethylene terephthalate

EDTA	Ethylene diaminetetra acetic acid tetrasodium salt
Others	
n.i.	No information
n.a.	Not applicable
MP	Microplastic
RT	Room temperature
Rep.	Representative
Pyr-GCMS	Pyrolysis gas chromatography mass spectrometry
IF	Influent
EF	Effluent
SEM/EDS	Scanning electron microscope with an elemental detection system
WPO	Wet peroxide oxidation with 30% H_2O_2
SE	Standard error
SD	Standard deviation
SS	Stainless steel

Abbreviations for countries: http://www.realifewebdesigns.com/web-marketing/abbreviations-countries.asp
Plastic compatibility with chemicals: http://sevierlab.vet.cornell.edu/resources/Chemical-Resistance-Chart-Detail.pdf

Table S2. Criteria used for the quantitative evaluation of the quality of microplastic concentration data.

Scores					
			2	**1**	**0**
Sampling	**1**	**Sampling methods**	**Surface & Ground water:** - Pump - Location - Materials used - Date - Depth of sampling **Tap water:** - Running tap before sampling - Flowrate - Source of tap water (tank/etc.) - Characteristics of sample **Drinking water bottle:** - Batch production lot - Flushing bottle 3 times with clean water - Shaking sample - Sparkling or still water **WWTP/DWTP:** - Location - Treatment - Date - Sampling method - Materials used **No flushing with sample.**	The study reported only a subset of the required characteristics (e.g., date, location, materials used), however is still fairly reproducible.	No/ insufficient reportage of sampling methods.
	2	**Sample size**	**Surface & ground water:** > 500 L **Tap water/DWTP:** ≥1000L	**Surface water:** < 500 L "with good cause" (high concentrations e.g.) Trawls without reporting volume is acceptable.	**Surface water:** < 500 L **Tap water/DWTP:** < 10L

			Drinking water bottle: ≥10L per study unit (production batch) or n≥10 bottles **WWTP:** - Influent: 1L - Effluent: >500 L or until sieve clogging *Sample volume may be smaller if target microplastic sizes are smaller*	**Tap water/DWTP:** 10 – 1000 L **Drinking water bottle**: 3<n<10 bottles **WWTP:** If insufficient volume, sampling till clogging	**Drinking water bottle:** < 10L per study unit **WWTP:** Insufficient sampling volume.
	3	**Sample processing and storage**	Sample storing shortly after sampling; any sample handling was avoided before arriving in the laboratory. Sample containers should be rinsed with filtered water. Sample preservation with chemicals should be justified and evaluated for compatibility. *Manta trawl nets are allowed to be rinsed with unfiltered water. Sieving in the field is acceptable if sample volume is large. Precautions should be taken to prevent contamination.*	Standards only partially met or containers are pre-rinsed with samples. Citizen science approach with validation	Samples are handled outside. Storage not mentioned. Citizen science approach without validation

Contamination mitigation	**4**	**Laboratory preparation**	- Cotton lab coat or non-synthetic clothes - Equipment and lab surfaces wiped and rinsed	- Solely wiping laboratory surfaces and equipment or not wearing a lab coat **IF** negative samples were run in parallel and examined for contamination.	No precautions.
	5	**Clean air conditions**	- Clean room or laminar flow cabinet	Mitigation of airborne contamination by carefully keeping samples closed as much as possible **IF** negative samples were run in parallel and examined for occurring contamination.	No regard of airborne contamination, or solely use of *fume hood.*
	6	**Negative control**	Controls (in triplicate) treated and analysed in parallel to actual samples. Sample concentrations need to be reported accounting for controls.	Insufficient form of a control, e.g. the filtration of air, or the sole examination of petri dishes/ soaked papers placed next to the samples.	No negative controls.

Sample purification/ handling	**7**	**Positive control**	Controls (triplicate) with an added amount of microplastic particles treated the alongside the samples, and for which the particle recovery rates are determined.	Insufficient form of a positive control (e.g. if only a part of the protocol is tested).	No positive controls.
	8	**Sample treatment (only for surface water and WWTP samples)**	Digestion of complete sample using a protocol with KOH, WPO and/or enzymes. If another chemical was used, effects on different polymers should be tested before application. All sample treatments need to be carried out below 50°C to prevent any damage to microplastics.	If proof is missing that polymers are not affected by protocol (e.g. heated KOH) **OR** in case studies exclusively focus on the bigger microplastics by sieving the samples (mesh size ≥ 300µm). If WPO is carried out without cooling.	No digestion of sample.
Chemical analysis	**9**	**Polymer identification**	Per study; analysis of all particles when numbers of pre-sorted particles are <100. For particle numbers >100, 50% should be identified, with a minimum of 100 particles. Per sample; analysis of all particles up to a maximum of 50 particles per sample.	Insufficient polymer identification, potentially resulting in an unrepresentative subsample. Identification with SEM/EDX to distinguish polymer	No polymer identification.

			Per filter: ≥25% of the surface area.	vs non-polymeric materials.	

Table S3. Scoring of individual studies

	Anderson et al. 2017 (Surface)		
1	Sampling methods	Sampling method (manta trawl), location, materials, date, depth mentioned.	2
2	Sample size	Trawling for >500 m, volume not mentioned.	1
3	Sample processing and storage	Nets rinsed, collected material preserved in 70% ethanol until laboratory processing; no rinsing of containers	1
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	Air (duplicate) and DI (quadruplicated) tested and corrected for.	1
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	WPO with Fe(II), 75°C	1
9	Polymer ID	Visual inspection; small subset identified with SEM-EDS	1
Total			7

	Baldwin et al., 2016 (Surface)		
1	Sampling methods	Discharge, drainage area, materials, method (neuston net), location, date, depth	2
2	Sample size	Volume not mentioned, net used until clogging	1
3	Sample processing and storage	Storage in glass jars (not rinsed), preserved in isopropyl alcohol	1
4	Lab preparation	Lab coats, non-synthetic clothing, negative controls included, no cleaning or rinsing mentioned	1
5	Clean air conditions	Lab air filtration system, samples processed in fume hood, samples covered, negative controls included	1
6	Negative controls	Negative controls for both field (n = 5) and lab (n = 11) included	2
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	H_2O_2 digestion with Fe(II) catalyst (heated to 75°C)	1
9	Polymer ID	Not mentioned	0
Total			9

	Browne et al, 2011 (WWTP)		
1	Sampling methods	Only waste water treatment mentioned	0
2	Sample size	Sample size not reported	0
3	Sample processing and storage	Collection in pre-cleaned (unknown with what) glass bottles with metal caps	1
4	Lab preparation	Cotton clothing was worn. No other precautions mentioned	0
5	Clean air conditions	No regard of airborne contamination.	0
6	Negative controls	No negative controls.	0
7	Positive controls	No positive controls.	0
8	Sample treatment (surface water)	No digestion of sample.	0
9	Polymer ID	FTIR analysis of all particles but volume sampled may be under-representative of effluent.	2
Total			3

	Cable et al. 2017 (Surface)		
1	Sampling methods	Method (manta trawl 100 µm mesh), location, materials, date, season mentioned.	2
2	Sample size	Trawling for 20 minutes. Volume not mentioned.	1
3	Sample processing and storage	Cod-end rinsed over sieves, stored in plastic bottles in 70% ethanol (rinsing not mentioned) or in Ziploc bags when items were too big (rinsing not mentioned).	1
4	Lab preparation	Cotton lab coats; all liquid that contacted samples was filtered over 10 µm, glassware for storage was blasted with high pressure air; Teflon sheets inserted between glassware and their lids (no rinsing of surfaces mentioned)	1
5	Clean air conditions	Samples processed in laminar-flow or fume hood, otherwise covered.	1
6	Negative controls	Three negative controls of MQ processed simultaneously. Values reported, but not corrected.	1
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	Sodium dodecyl sulphate (50 °C). Enzymes and WPO (75 °C).	1
9	Polymer ID	SEM-EDS on a subset of particles from smallest size class.	1
Total			9

	Carr et al, 2016 (WWTP)		
1	Sampling methods	Treatment mentioned. Pumped samples from plumbing and flows in plant facility. Dates reported.	2
2	Sample size	All volumes mentioned, and were sufficient.	2
3	Sample processing and storage	Samples stored in plastic centrifuge tube. No rinsing mentioned.	1
4	Lab preparation	No precautions.	0
5	Clean air conditions	Use of fume hood.	0
6	Negative controls	No negative controls.	0
7	Positive controls	No positive controls.	0
8	Sample treatment (surface water)	No digestion of samples	0
9	Polymer ID	Some particle analysed with ATR- FTIR	1
Total			6

	Di & Wang 2018 (Surface)		
1	Sampling methods	Pump, 1m depth, date, location reported.	2
2	Sample size	25 L.	0
3	Sample processing and storage	Samples fixed in formalin and stored at 4°C	2
4	Lab preparation	Precautions taken and workplace cleaned, water and solutions used were filtered through 0.45 µm.	2
5	Clean air conditions	Not mentioned	0
6	Negative controls	Not mentioned	0
7	Positive controls	Conducted but no replicates.	1
8	Sample treatment (surface water)	Samples dried at 50%, WPO without catalyst	2
9	Polymer ID	Micro- Raman spectroscopy on 174 MPs, total count was unclear	1
Total			10

	Dris et al, 2015 (WWTP)		
1	Sampling methods	Materials, treatment, date mentioned. Method partly unclear (“automatic sampler and 24-averaged samples”)	1
2	Sample size	0.05L	0
3	Sample processing and storage	Not mentioned	0
4	Lab preparation	Cotton laboratory coats, samples covered with tin foil, equipment heated at 500 °C. No rinsing of surfaces or materials mentioned.	1
5	Clean air conditions	Mitigation of airborne contamination by keeping samples closed with aluminium foil. Negative controls included.	1
6	Negative controls	Blanks included (n = unknown), number of fibres negligible	1
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	Not mentioned	0
9	Polymer ID	Not mentioned	0
Total			4

	Dris et al, 2015 (surface)		
1	Sampling methods	Method (plankton net and manta trawl), materials, treatment, date mentioned.	2
2	Sample size	450 – 2000 L.	1
3	Sample processing and storage	nets rinsed 3 times with river water into glass vessels (heated till 500 °C), covered with aluminium foil	2
4	Lab preparation	Cotton lab coats, samples covered with tin foil, equipment heated at 500 °C, cleaning of surfaces not mentioned	1
5	Clean air conditions	Mitigation of airborne contamination by keeping samples closed with aluminium foil. Negative controls included.	1
6	Negative controls	Blanks included (n = unknown), number of fibres negligible	1
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	Not mentioned	0
9	Polymer ID	Not mentioned	0
Total			8

	Dris et al. 2018 (Surface)		
1	Sampling methods	Location, materials (plankton net with 80 µm mesh), dates, depth, flow mentioned.	2
2	Sample size	Triplicate of 1 min sampling, >2m^3.	2
3	Sample processing and storage	Outside of net was rinsed with river water after collection. Storage not mentioned.	0
4	Lab preparation	Vessels and filters were heated to 500ºC; covered in aluminium foil at all times; cotton lab coats; filtration process could not be covered, but blanks were performed in this case. No rinsing of surfaces mentioned.	1
5	Clean air conditions	Not mentioned, but samples closed as much as possible and negative controls included.	1
6	Negative controls	Blanks included (n = unknown), number of fibres negligible.	1
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	SDS at 70 °C, biozyme at 40 °C and WPO treatment at 40 °C.	1
9	Polymer ID	Small subset (25 fibres) identified with micro- FTIR spectroscopy.	1
Total			9

	Dyachenko et al., 2017 (WWTP)		
1	Sampling methods	Date not mentioned, materials, methods and treatments are mentioned.	1
2	Sample size	Not mentioned.	0
3	Sample processing and storage	Stored in glass jar at 4°C, rinsing not mentioned	1
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	Not mentioned	0
7	Positive controls	Spiking with PS, 87% recovery. No replicates.	1
8	Sample treatment (surface water)	H_2O_2 with $FeSO_4$, heated at 70°C	1
9	Polymer ID	Some samples identified with micro- FTIR, unclear how many	1
Total			5

	Eriksen et al., 2013 (Surface)		
1	Sampling methods	Date, method (manta trawl), location, tow speed and sea state using Beaufort scale mentioned.	2
2	Sample size	Volume not mentioned/calculated, 60 min trawling with manta net.	1
3	Sample processing and storage	Stored in isopropyl alcohol, container material unknown.	1
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	Not mentioned	0
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	No digestion of samples.	0
9	Polymer ID	Not mentioned	0
Total			4

	Estahbanati et al. 2016 (Surface)		
1	Sampling methods	Method (plankton net), location, materials, dates, depth mentioned	2
2	Sample size	>1 m^3.	2
3	Sample processing and storage	Nets were transferred to lab for analysis. Storage not mentioned.	1
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	DI water over plankton net, number unknown	1
7	Positive controls	Spiked PE over plankton net. Recoveries reported. (Duplicate, not triplicate)	1
8	Sample treatment (surface water)	Dried at 90ºC, WPO with Fe(II) heated to 75 °C.	1
9	Polymer ID	Not mentioned.	0
Total			8

	Faure et al. 2015 (Surface)		
1	Sampling methods	Method (manta trawl), materials mentioned. Dates unclear (“rivers after Oct 2013”).	1
2	Sample size	320-430m^3	2
3	Sample processing and storage	Samples stored at 4 °C in polystyrene tubes in salt-saturated water until analysis (rinsing uknown).	1
4	Lab preparation	Clothes made of natural fibres, air exposure of samples limited, use of Milli-Q water, cleaning of tools and containers with stereomicroscope, work surface cleaning not mentioned.	1
5	Clean air conditions	Not mentioned	0
6	Negative controls	Not mentioned	0
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	WPO with Fe(II) (Baker protocol, 75 °C).	1
9	Polymer ID	All macroplastics (n=169) and 10 % (n= 206) of sorted microplastics, randomly chosen, identified with ATR-FTIR.	1
Total			7

	Fischer et al., 2016 (Surface)		
1	Sampling methods	Date, lake characteristics, method (manta trawl), weather conditions mentioned	2
2	Sample size	Volume not mentioned explicitly	1
3	Sample processing and storage	Stored in glass bottles (rinsing not mentioned), ethanol, cool place.	1
4	Lab preparation	No precautions mentioned	0
5	Clean air conditions	Samples closed as much as possible but no negative controls were run	0
6	Negative controls	Not mentioned	0
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	Hot digestion with HCl for 48h room temperature + 1h at 70°C	1
9	Polymer ID	No polymer ID mentioned	0
Total			5

	Free et al., 2014 (Surface)		
1	Sampling methods	Date, method (manta trawl), weather condition mentioned.	2
2	Sample size	Volume unknown, 60 min per trawl	1
3	Sample processing and storage	Storage in 70% ethanol, containers not mentioned	1
4	Lab preparation	Not mentioned..	0
5	Clean air conditions	Not mentioned.	0
6	Negative controls	Not mentioned.	0
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	H_2O_2 digestion with Fe(II) catalyst.	1
9	Polymer ID	No polymer ID mentioned	0
Total			5

	Hendrickson et al., 2018 (Surface)		
1	Sampling methods	Location, method (manta trawl), materials used and date mentioned.	2
2	Sample size	Volume unknown, total surface area sampled:1.56E-2 km^2.	1
3	Sample processing and storage	Collected in combusted glass containers with Teflon caps and stored in cool dark place	2
4	Lab preparation	Non-synthetic clothing, equipment rinsed, negative controls included (surface cleaning not mentioned)	1
5	Clean air conditions	Samples closed and negative controls were run during sampling and laboratory analysis.	1
6	Negative controls	Duplicate petri dishes left while sampling. Replicate method blanks performed (number of replicates unknown).	1
7	Positive controls	Included in duplicate for method testing.	1
8	Sample treatment (surface water)	Drying at 90°C, WPO with Fe^{2+} at 75°C	1
9	Polymer ID	10% of sorted MP analysed with Pyrolysis GC-MS, and ATR-FTIR prior to Pyrolysis GC-MS if particles were big enough.	1
Total			11

	Hoellein et al. 2017 (Surface)		
1	Sampling methods	Method (neuston net), date, location, weather conditions	2
2	Sample size	Not mentioned.	1
3	Sample processing and storage	Acid-washed containers	2
4	Lab preparation	Covered with parafilm/Aluminium foil during sample processing. Accounted for procedural and reagent contamination. Cleaning and other precautions not mentioned.	0
5	Clean air conditions	Not mentioned.	0
6	Negative controls	Blanks with deionised water, corrected for in counts, number of blanks unclear	1
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	WPO with 0.05 M Fe(II) at 75°C	1
9	Polymer ID	Pyrolysis-GCMS on subset of sorted MP, but not clear how large	1
Total			8

	Kosuth et al. 2018 (Tap)		
1	Sampling methods	Method mentioned: tap run before sampling. Source not reported in detail.	0
2	Sample size	~500 ml	0
3	Sample processing and storage	Not fully reported, partly done by volunteers / non-scientists, pre-rinsing with sample	0
4	Lab preparation	Cotton lab coats, lab surfaces and glassware cleaned & covered	2
5	Clean air conditions	Laminar airflow cabinet	2
6	Negative controls	Blanks included (n = 30) and reported, and background contamination accounted for	2
7	Positive controls	No positive controls	0
8	Sample treatment (surface water)	Not required for tap water	2
9	Polymer ID	No polymer identification performed for the water samples	0
Total			8

	Lahens et al. 2018 (Surface)		
1	Sampling methods	Location, date, materials, method (grab and trawl), season mentioned, depth and net type not mentioned.	1
2	Sample size	0.3 L (fibres), or 60 s with net and flowmeter, then rinsed in glass container (fragments, unknown volume)	1
3	Sample processing and storage	Stored in glass container, rinsing not mentioned.	1
4	Lab preparation	Not mentioned.	0
5	Clean air conditions	Not mentioned.	0
6	Negative controls	Not mentioned.	0
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	SDS at 70°C, enzymatic and peroxide digestion at 40°C	1
9	Polymer ID	76 fibres out of a total of 725, and 57 fragments of a total of 368, analysed with ATR-FTIR.	1
Total			5

	Lares et al, 2018 (Surface)		
1	Sampling methods	Method (Grab), materials, date, depth not mentioned	1
2	Sample size	Volume sampled 18.5-30L. Insufficient volume sampled and did not justify the cause for selecting volume.	0
3	Sample processing and storage	Samples sieved upon collection and transferred to laboratory in sealed beakers, storage details were provided, unclear if containers were rinsed.	1
4	Lab preparation	Filters and petri dishes were examined under microscope, surfaces wiped thrice with non-synthetic wipes, glass and metal dishes used.	2
5	Clean air conditions	Samples kept covered as much as possible. Negative samples run in parallel (from sampling in the field), and examined for occurring contamination.	1
6	Negative controls	Controls treated and analysed in parallel to actual samples.	2
7	Positive controls	No positive controls.	0
8	Sample treatment (surface water)	Samples dried at 75°C. H_2O_2 and Fe(II) digestion (75°C)	1
9	Polymer ID	Polymer identification (micro-FTIR and micro-Raman spectroscopy) on subsample(1.3-1.4%) of sorted particles and fibres.	1
Total			9

	Lares et al, 2018 (WWTP)		
1	Sampling methods	Method (Grab), materials, date, treatment mentioned.	2
2	Sample size	4 - 30L	0
3	Sample processing and storage	Stored in sealed beakers (rinsing not mentioned) .	1
4	Lab preparation	Filters and petri dishes were examined under microscope, surfaces wiped thrice with non-synthetic wipes, glass and metal dishes used.	2
5	Clean air conditions	Samples kept covered as much as possible. Negative samples run in parallel (from sampling in the field), and examined for occurring contamination.	1
6	Negative controls	Controls treated and analysed in parallel to actual samples.	2
7	Positive controls	No positive controls.	0
8	Sample treatment (surface water)	Samples dried at 75°C. H_2O_2 and Fe(II) digestion (75°C)	1
9	Polymer ID	Polymer identification (micro-FTIR and micro-Raman spectroscopy) on subsample(1.3-1.4%) of sorted particles and fibres.	1
Total			10

	Leslie et al, 2017 (Surface)		
1	Sampling methods	Method (bulk sampling with glass jars), location and materials used mentioned. Date not mentioned.	1
2	Sample size	Samples were collected in 2 L glass jars; a 50 or 100 g subsample was analysed.	0
3	Sample processing and storage	Glass jars, pre-rinsed with MQ water	2
4	Lab preparation	Not mentioned.	0
5	Clean air conditions	No laminar flow hood, but procedural blanks included.	1
6	Negative controls	Procedural blanks, corrected for fibres, number of blanks unknown.	1
7	Positive controls	No positive controls.	0
8	Sample treatment (surface water)	No sample treatment.	0
9	Polymer ID	No polymer identification performed for the water samples.	0
Total			5

	Leslie et al, 2017 (WWTP)		
1	Sampling methods	Materials, methods known, date and treatment unknown	1
2	Sample size	Maximum sample size assumed to be 2 L since container volume size is 2 L.	0
3	Sample processing and storage	Stored in glass jars (pre-cleaned)	2
4	Lab preparation	Precautions were taken during sampling to avoid sample contamination the field. Precautions were taken in the laboratory by measuring blanks during analysis. No cleaning mentioned.	0
5	Clean air conditions	Mitigation of airborne contamination by analysing procedural blanks.	1
6	Negative controls	Controls treated and analysed in parallel to actual samples and reported a mean of 2 fibres per blank. Fibre concentrations reported were corrected for the blanks, number of controls unknown.	1
7	Positive controls	No positive controls.	0
8	Sample treatment (surface water)	No digestion of sample.	0
9	Polymer ID	Polymer identification performed only for sediment and biota samples from study and WW samples were assumed to have similar particles as the other components.	0
Total			5

	Magnusson and Noren, 2014 (WWTP)		
1	Sampling methods	Method (Ruttern sampler), materials, treatment and date mentioned.	2
2	Sample size	IF: 2L. EF: 1000 L.	2
3	Sample processing and storage	Samples were stored in petri dishes, no mention of rinsing	1
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	Not mentioned	0
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	Not mentioned	0
9	Polymer ID	ATR- FTIR analyses for small subset of sorted particles .	1
Total			6

	Mani et al, 2015 (Surface)		
1	Sampling methods	Method (manta trawl), location, materials, date.	2
2	Sample size	60-250 m^3	2
3	Sample processing and storage	Bottles flushed with tap water	1
4	Lab preparation	Cotton coats, plastic/glassware rinsed and covered, cleaning of surfaces not mentioned.	1
5	Clean air conditions	No laminar flow hood, but blanks were run	1
6	Negative controls	Blanks were done for part of the process, not clear how many and if samples were corrected for blanks	1
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	SDS (70 °C), enzymes (37 °C), H_2O_2 (37 °C)	1
9	Polymer ID	ATR-FTIR on 118 out of 25 956 particles.	1
Total			10

	Mason et al., 2016 (WWTP)		
1	Sampling methods	Method (pump), flow-rate, date, location, treatments mentioned	2
2	Sample size	≥500L	2
3	Sample processing and storage	Preserved in isopropyl alcohol, no mention of container rinsing.	1
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	Blanks included (n=7), values recorded	2
7	Positive controls	No positive controls	0
8	Sample treatment (surface water)	WPO with Fe(II) (temperature not mentioned)	1
9	Polymer ID	No polymer identification	0
Total			8

	Mason et al., 2016b (Surface)		
1	Sampling methods	Method (manta trawl), date, location mentioned.	2
2	Sample size	Volume not mentioned/calculated, 30 min trawling.	1
3	Sample processing and storage	Stored in isopropyl alcohol, no mention of container rinsing.	1
4	Lab preparation	Not mentioned.	0
5	Clean air conditions	Not mentioned.	0
6	Negative controls	Six blanks included, no particles found.	2
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	WPO with Fe(II) catalyst (temperature not mentioned)	1
9	Polymer ID	Subset of >4.75 mm particles (59%) analysed with ATR-FTIR. Subset of particles 0.355- 0.999 µm (20%) analysed with SEM/EDS.	1
Total			8

	Mason et al, 2018 (Bottle)		
1	Sampling methods	Brand, lot, origin. No mention of flushing or shaking of bottles, polymer of bottle cap.	1
2	Sample size	Replicated bottles, total volume > 5-6 L	2
3	Sample processing and storage	Bottles opened in laminar flow hood	2
4	Lab preparation	Cotton lab coats, cleaning of lab and equipment not sufficient (once a week)	1
5	Clean air conditions	Laminar flow hood	2
6	Negative controls	Blanks included and fully reported	2
7	Positive controls	Positive controls included, but only for < 100 um particles	1
8	Sample treatment (surface water)	Not required for bottled water	2
9	Polymer ID	ATR-FTIR analysis on ~1000 particles (50%) of >100 um (not 50% of entire sample)	1
Total			14

	McCormick et al., 2014 (Surface)		
1	Sampling methods	Method (neuston net), date, location, materials mentioned. Depth not mentioned.	1
2	Sample size	Volume not mentioned, 20 min trawling	1
3	Sample processing and storage	Stored in Nalgene containers, no rinsing mentioned, at 4°C	1
4	Lab preparation	Not mentioned.	0
5	Clean air conditions	Not mentioned.	0
6	Negative controls	Four negative controls included, values corrected for the controls.	2
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	WPO with Fe(II) catalyst at 75°C	1
9	Polymer ID	Not mentioned.	0
Total			6

	McCormick et al., 2016 (Surface)		
1	Sampling methods	Method (neuston net) location, date mentioned. Depth not mentioned	1
2	Sample size	Trawl for 15-20 min, volume not mentioned.	1
3	Sample processing and storage	Stored in container (rinsing not mentioned) and at 4°C.	1
4	Lab preparation	Not mentioned.	0
5	Clean air conditions	Not mentioned.	0
6	Negative controls	Blanks included (n=5) and accounted for.	2
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	WPO with Fe (II) at 75°C	1
9	Polymer ID	Subset analysed (n = 8 particles) with Pyrolysis GC-MS.	1
Total			7

	Michielssen et al, 2016 (WWTP)		
1	Sampling methods	Method, treatment, date, location mentioned	2
2	Sample size	Sampling volumes met for influent (1-2 L) but insufficient volume sampled for effluent (34-38 L).	1
3	Sample processing and storage	Samples were stored in plastic containers (rinsed with DI water) at 4°C until analysis.	2
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	A blank control sample was processed in parallel with samples. Blank was not accounted for as only 1 fibre was found. No triplicates were performed.	1
7	Positive controls	No positive controls.	0
8	Sample treatment (surface water)	No digestion of sample.	0
9	Polymer ID	No polymer identification.	0
Total			6

	Miller et al, 2017 (Surface)		
1	Sampling methods	Location, method (grab), materials, depth mentioned, no date mentioned	1
2	Sample size	142 samples of 1 L	0
3	Sample processing and storage	rinsed glass jars, rinsed with tap water	1
4	Lab preparation	Pre-rinsed (with tap water) materials, cotton lab coats, cleaning of surfaces not mentioned	1
5	Clean air conditions	Triple rinsed and covered, no clean air	1
6	Negative controls	Many blanks, corrected for air blanks, not for water blanks (negligible)	2
7	Positive controls	not reported	0
8	Sample treatment (surface water)	No digestion	0
9	Polymer ID	14 fibres were checked (14%) using micro- FTIR spectroscopy	1
Total			7

	Mintenig et al., 2017 (WWTP)		
1	Sampling methods	Method (pump), location, treatment, materials, date mentioned	2
2	Sample size	≥390 L, but clogging reported	2
3	Sample processing and storage	Filtration units sealed and stored at 4 °C.	2
4	Lab preparation	Lab coats, rinsing of materials, negative controls, no mention of cleaning work surfaces	1
5	Clean air conditions	No laminar flow cabinet, but negative samples run in parallel	1
6	Negative controls	Triplicate negative controls.	2
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	Enzyme digestion + WPO, heating up to 70°C	1
9	Polymer ID	All sorted MP > 500 µm analysed with ATR- FTIR, for MP < 500 µm, 25% of filter surface analysed with FTIR imaging.	2
Total			13

	Mintenig et al., 2019 (Tap)		
1	Sampling methods	Date, location, method (pump), flow rate, running before sampling, source, characteristics	2
2	Sample size	1200 – 2500 L	2
3	Sample processing and storage	Milli-Q rinsing, closed, kept at 4°C	2
4	Lab preparation	Cotton lab coats, non-synthetic fabric, lab surfaces wiped, equipment rinsed with milli-Q and covered	2
5	Clean air conditions	No clean room or laminar flow hood, however samples were kept close and blanks were run	1
6	Negative controls	Blanks (n=4) were included and samples were corrected for the mean	2
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	0.01 M HCl, H_2O_2 at 40°C	2
9	Polymer ID	All particles analysed, whole filter surface analysed with FTIR imaging.	2
Total			15

	Mintenig et al., 2019 (Ground water)		
1	Sampling methods	Date, location, method (pump), depth, flow rate, source, characteristics	2
2	Sample size	300 – 1000 L or until sieve clogging	1
3	Sample processing and storage	Milli-Q rinsing, closed, kept at 4°C	2
4	Lab preparation	Cotton lab coats, non-synthetic fabric, lab surfaces wiped, equipment rinsed with milli-Q and covered	2
5	Clean air conditions	No clean room or laminar flow hood, however samples were kept close and blanks were run	1
6	Negative controls	Blanks (n=4) were included and samples were corrected for the mean	2
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	0.01 M HCl, H_2O_2 at 40°C	2
9	Polymer ID	All particles analysed, whole filter surface analysed with FTIR imaging.	2
Total			14

	Murphy et al, 2016 (WWTP)		
1	Sampling methods	Treatment, method, materials mentioned. Date not mentioned, location unclear.	1
2	Sample size	IF: 30 L EF: Did not meet either > 500 L or clogging criteria. Study only filtered 50 L of EF before the sieves became clogged.	1
3	Sample processing and storage	Sieved on site, stored in glass bottles (Cleaned with distilled water) with distilled water, closed off.	2
4	Lab preparation	Cotton lab coats and natural fabric was worn at all times, surfaces wiped down and equipment cleaned and examined for MP contamination.	2
5	Clean air conditions	Monitoring MP contamination on lab benches via tape-lifting method and airborne particulates by atmospheric deposition on filters in petri dishes during sample processing. No clean air conditions.	1
6	Negative controls	Insufficient form of a control. Did not identify items found on filters and thus were improperly reported and negative controls were not considered in final results.	1
7	Positive controls	No positive controls.	0
8	Sample treatment (surface water)	No digestion of sample	0
9	Polymer ID	4/24th (16.6%) of filter analysed with micro-FTIR spectroscopy.	1
Total			9

	Oßmann et al. 2018 (Bottle)		
1	Sampling methods	Age of bottle, label material, usage type (single-use, reusable), carbonation reported, production batch not mentioned.	1
2	Sample size	0.5 – 1.0 L is adequate for the smallest size fraction, but not for the larger size fraction that was also targeted.	1
3	Sample processing and storage	Exterior of bottles cleaned and dried in laminar flow box prior to transferring samples.	2
4	Lab preparation	Cotton lab coats and glassware rinsed with SDS, 50% ethanol and ultrapure water. Wiping of surfaces not mentioned but analysis was carried out in clean room.	2
5	Clean air conditions	Clean room and laminar flow box.	2
6	Negative controls	7 blanks but did not mention if reported concentrations accounted for blanks.	2
7	Positive controls	No positive controls.	0
8	Sample treatment (surface water)	EDTA and SDS added to samples. 50% ethanol used to remove foam.	2
9	Polymer ID	4.4 % filter area analysed with micro-Raman spectroscopy (particle sizes ≥ 1 µm)	1
Total			13

	Pivokonsky et al., 2018 (raw & treated drinking water)		
1	Sampling methods	Source of (surface) water, characteristics, date, treatments, materials and method mentioned. Location of DWTPs and their source waters not specified.	1
2	Sample size	1 L is adequate for the smallest size fraction, but not for the larger size fraction that was also targeted.	1
3	Sample processing and storage	Samples stored in 1L pre-cleaned glass bottles at 4°C.	2
4	Lab preparation	Cotton clothing, equipment rinsed but wiping of surfaces not mentioned.	1
5	Clean air conditions	Lab air filtered with HEPA air filters. This doesn't avoid sample contamination from cloths or synthetic particles that are already in the lab, however procedural blanks were included.	1
6	Negative controls	Triplicate negative controls each sampling day, contaminated with <5% of MP concentration in samples, so neglected.	2
7	Positive controls	No positive controls mentioned	0
8	Sample treatment (surface water)	WPO treatment with Fe(II) and heated to 75°C.	1
9	Polymer ID	Micro-FTIR (25% of filter surface, for >10 um) and micro-Raman imaging (25% of filter surface, for 1 - 10 um). Corrected MP numbers by percentages of non-plastic particles.	2
Total			11

	Rodrigues et al., 2018 (Surface)		
1	Sampling methods	Method (pump), materials, date, location, depth.	2
2	Sample size	1.2m^3 per site	2
3	Sample processing and storage	Stored in glass flasks (not rinsed) in fridge	1
4	Lab preparation	Not mentioned	1
5	Clean air conditions	Not mentioned	0
6	Negative controls	Negative controls included, but no procedural blanks.	1
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	H_2O_2 digestion at 75°C	1
9	Polymer ID	Subset analysed with ATR-FTIR, but unknown amount.	1
Total			9

	Schymanski et al., 2018 (Bottle)		
1	Sampling methods	Flushing with 50 mL, polymer of caps not mentioned for all bottles	1
2	Sample size	Per brand or batch, one bottle (750 - 1500 ml)	0
3	Sample processing and storage	Not relevant	2
4	Lab preparation	Very careful cleaning, including rinsing of exterior of bottles.	2
5	Clean air conditions	Laminar flow workbench	2
6	Negative controls	18 replica's for negative controls, values reported	2
7	Positive controls	No positive controls	0
8	Sample treatment (surface water)	Not relevant	2
9	Polymer ID	All filters analysed using micro- Raman spectroscopy (Single Particle Explorer).	2
Total			13

	Sighicelli et al., 2018 (Surface)		
1	Sampling methods	Location, method (manta trawl), depth, season mentioned	2
2	Sample size	Mean 240 m^3	2
3	Sample processing and storage	Stored in glass vials (rinsing not mentioned), in H_2O_2 (30% at 4°C) in fridge	1
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	No negative controls included	0
7	Positive controls	No positive controls included	0
8	Sample treatment (surface water)	Exclusively focussed on > 300 um, H_2O_2 (30% at 4°C) in fridge	2
9	Polymer ID	Total of 46% sorted particles analysed with ATR- FTIR.	1
Total			8

	Simon et al, 2018 (WWTP)		
1	Sampling methods	Collected sample with automatic sampler over 24 h. Raw wastewater filtered on site through 10 µm steel sieves. Treatment: S. Date not mentioned, locations not explicitly mentioned.	1
2	Sample size	Raw WW volume sampled was 1 L. Effluent sampled varied from 4.1-81.5 L. Volume standard for effluent was not met.	1
3	Sample processing and storage	Storage after sieving not explicitly mentioned.	0
4	Lab preparation	Precautions were taken such as minimizing plastic tools for sampling and analysis, muffling of steel filters, covering glassware with aluminium foils, no mention of cleaning surfaces.	1
5	Clean air conditions	Mitigation of airborne contamination by keeping samples closed with aluminium foil.	1
6	Negative controls	Blanks were run in triplicates and followed the same treatment as samples and accounted for in results.	2
7	Positive controls	Positive controls were performed with triplicate analysis.	2
8	Sample treatment (surface water)	Raw WW sample incubated with cellulase enzyme for 48 h at 40°C. Wet peroxide oxidation with Fe(II) and H_2O_2 was performed in ice-bath.	2
9	Polymer ID	2-6% of homogenized sample transferred on transmission/ reflectance window, all analysed with FTIR- imaging.	1
Total			11

	Su et al., 2016 (Surface)		
1	Sampling methods	Method (plankton net and bulk surface), location, depth, date and season mentioned	2
2	Sample size	Plankton net (volume not explicitly mentioned) and 5L bulk sample.	1
3	Sample processing and storage	Samples stored in methyl aldehyde at 4°C, containers rinsed	1
4	Lab preparation	Lab coats, negative controls included, all equipment rinsed three times with filtered (0.45 um) tap water, cleaning of surfaces not mentioned.	1
5	Clean air conditions	Mitigation by keeping samples closed, negative controls included	1
6	Negative controls	Negative controls (number unknown) included and analysed	1
7	Positive controls	Not mentioned.	0
8	Sample treatment (surface water)	WPO at 65°C	1
9	Polymer ID	Subset of sorted particles (113 from the total 1805) analysed with micro-FTIR spectroscopy or SEM/EDS.	1
Total			9

	Talvitie et al., 2015 (WWTP)		
1	Sampling methods	Method (pump), materials, treatment, date mentioned	2
2	Sample size	0.3 - 285 L, Volume < 1L for some samples	1
3	Sample processing and storage	Not mentioned	0
4	Lab preparation	Rinsing of equipment mentioned (tap water), clothing not mentioned, cleaning of work surfaces not mentioned	0
5	Clean air conditions	No clean air conditions	0
6	Negative controls	Number of blanks unknown , no contamination found	1
7	Positive controls	No positive controls	0
8	Sample treatment (surface water)	No sample treatment, particles ≥ 20 um	0
9	Polymer ID	No polymer identification	0
Total			4

	Talvitie et al., 2017 (WWTP)		
1	Sampling methods	Treatment, materials, methods, location, date mentioned	2
2	Sample size	Influent: 0.1L, effluent 2L (20 um sieve)	0
3	Sample processing and storage	Storage in clean petri dishes, all material rinsed with tap water	1
4	Lab preparation	Not mentioned.	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	Triplicate negative controls	2
7	Positive controls	No positive controls	0
8	Sample treatment (surface water)	No sample treatment, particles ≥20 um included	0
9	Polymer ID	Subset of sorted particles (from 3 effluent samples) analysed with FTIR imaging.	1
Total			6

	Talvitie et al., 2017b (WWTP)		
1	Sampling methods	Method, date, materials, treatments described in detail	2
2	Sample size	Some sample volumes too small (0.4 L influent, 140 L effluent), but mentioned that this could result in false zero's.	1
3	Sample processing and storage	Storage in petri dishes or in container (rinsed with tap water), depending on sample method and stored in fridge	1
4	Lab preparation	Rinsing of equipment with tap water, negative controls included (tap water), no other precautions mentioned, no cleaning of surfaces mentioned.	1
5	Clean air conditions	Careful handling of samples, negative controls included	1
6	Negative controls	Triplicate negative controls included, no contamination found.	2
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	Not mentioned	0
9	Polymer ID	All sorted particles and fibres analysed with FTIR-imaging.	2
Total			10

	Vermaire et al., 2017 (Surface)		
1	Sampling methods	Depth of sampling, materials, season, method mentioned	2
2	Sample size	Partly 100 L, partly 100 000 L (different methods)	1
3	Sample processing and storage	Manta net was backwashed with river water between samples, the cod-end was washed with deionized water. Packed in whirl-pak bag and stored in fridge	2
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	11 negative controls included: unfiltered tap water (from filtered source), values reported and corrected for	2
7	Positive controls	No positive controls included	0
8	Sample treatment (surface water)	H_2O_2 at 80°C	1
9	Polymer ID	Not included	0
Total			8

	Vermaire et al., 2017 (WWTP)		
1	Sampling methods	Depth and method mentioned. Treatments not mentioned	1
2	Sample size	300 L	0
3	Sample processing and storage	Packed and stored in fridge (whirl-pak bag)	2
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	11 negative controls included: unfiltered tap water (from filtered source), values reported and corrected for	2
7	Positive controls	No positive controls included	0
8	Sample treatment (surface water)	H_2O_2 at 80°C	1
9	Polymer ID	Not included	0
Total			6

	Vollertsen et al., 2017 (WWTP)		
1	Sampling methods	Waste water treatment not mentioned, date not mentioned	0
2	Sample size	1L influent, 3x clogging effluent (0.5 – 108 litres per filter)	2
3	Sample processing and storage	Raw waste water stored in glass jar. Treated WW was filtered on site over 3 filters of 10um, particles from filter were concentrated in 5 mL ethanol. Storage of treated WW not explicitly mentioned.	1
4	Lab preparation	Not mentioned	0
5	Clean air conditions	Not mentioned	0
6	Negative controls	Not mentioned	0
7	Positive controls	Spike raw waste water (recovery mentioned)	2
8	Sample treatment (surface water)	SDS + Enzyme digestion + H_2O_2 with unknown catalyst	1
9	Polymer ID	Micro- FTIR spectroscopy, however, analysed filter surfaces unknown	1
Total			7

	Wang et al., 2017 (Surface)		
1	Sampling methods	Method (pump), location, date mentioned, depth unknown	1
2	Sample size	20 L	0
3	Sample processing and storage	glass jars (not rinsed), in formalin solution, in fridge	1
4	Lab preparation	Rinsing of materials three times with distilled water, covered with aluminium foil, stereomicroscopic check of petri dishes, lab coat, cleaning of workspace	2
5	Clean air conditions	Closed samples, negative controls included	1
6	Negative controls	Negative controls (triplicate) for field- and lab work included, accounted for	2
7	Positive controls	Not mentioned	0
8	Sample treatment (surface water)	H_2O_2 at room temperature	2
9	Polymer ID	Analysis for a subset of pre- sorted particles (2 particles per location) with SEM and micro- FTIR spectroscopy.	1
Total			10

	Wang et al, 2018 (Surface)		
1	Sampling methods	Date, location, depth, method (pump), materials	2
2	Sample size	20 L, but concentrations high enough	1
3	Sample processing and storage	rinsing of filter with distilled water into glass bottle (unclear if rinsed), formalin storage	1
4	Lab preparation	cotton lab coat, gloves, rinsing and cleaning of equipment and surfaces	2
5	Clean air conditions	laminar flow hood	2
6	Negative controls	Field blank tests, plus lab procedural blanks (triplicate)	2
7	Positive controls	Included with 92.7% recovery	2
8	Sample treatment (surface water)	30% H_2O_2. effects tested (no effect found)	2
9	Polymer ID	Raman on 50 particles per lake (the total is unclear) analysed with micro- Raman spectroscopy.	1
Total			15

	Xiong et al, 2018 (Surface)		
1	Sampling methods	Date, location, method (trawl), depth mentioned	2
2	Sample size	No volume reported, data expressed as #/km^2.	1
3	Sample processing and storage	Stored in glass bottle (rinsing not mentioned) and preserved with 5% methyl aldehyde.	0
4	Lab preparation	Nitrile gloves, cotton lab coat, shower cap (plastic), covered container, desktop, hands, and clothes cleaned with sticky dust drum.	1
5	Clean air conditions	Fume hood, samples covered when not used, blanks included	1
6	Negative controls	Blanks included. Not indicated how many and if corrections for blanks were done	1
7	Positive controls	No positive controls	0
8	Sample treatment (surface water)	30% H_2O_2, 60°C, overnight	1
9	Polymer ID	For samples with a low MP concentration (<100 particles all particles analysed, and 10-15% of particles analysed when sample concentrations were > 100 particles. Analysis done with micro- Raman spectroscopy.	1
Total			8

	Zhang et al, 2015 (Surface)		
1	Sampling methods	Location, trawl, , materials, date, depth mentioned	2
2	Sample size	Trawl, volume unclear	1
3	Sample processing and storage	Methyl aldehyde and stored at 4 C, no rinsing of containers	0
4	Lab preparation	No information provided	0
5	Clean air conditions	No information provided	0
6	Negative controls	No information provided	0
7	Positive controls	No information provided	0
8	Sample treatment (surface water)	no digestion	0
9	Polymer ID	50 - 100 particles per site analysed with ATR-FTIR, but total MP numbers unknown.	1
Total			4

	Zhang et al, 2017 (Surface)		
1	Sampling methods	Method (surface trawling), location, date, materials	2
2	Sample size	Trawl, volume unclear	1
3	Sample processing and storage	Methyl aldehyde and stored at 4 °C, containers rinsed	1
4	Lab preparation	Cotton coat, containers washed and covered, cleaning work surfaces not mentioned.	1
5	Clean air conditions	Laminar flow hood	2
6	Negative controls	No information provided	0
7	Positive controls	No information provided	0
8	Sample treatment (surface water)	No information provided	0
9	Polymer ID	All presorted particles analysed with micro-Raman spectroscopy.	2
Total			9

	Ziajahromi et al., 2017 (WWTP)		
1	Sampling methods	Treatment, materials method (pump), date mentioned.	2
2	Sample size	Sample volume 3-200L for effluent (until clogging)	2
3	Sample processing and storage	Storage in clean petri dishes (rinsing not mentioned) and sealed in aluminium foil.	1
4	Lab preparation	Materials rinsed with ultra pure water, no wiping of surface, but negative controls included	1
5	Clean air conditions	Use of fume hood, but samples covered and negative controls included	1
6	Negative controls	Negative controls included, number of controls not mentioned.	1
7	Positive controls	Positive controls for sampling and analyses, only part of the process, number of controls unclear	1
8	Sample treatment (surface water)	Heating up to 90°C, WPO at 60 °C	1
9	Polymer ID	All pre-sorted particles analysed using ATR-FTIR.	2
Total			12

Table S4 Pairwise comparisons of microplastic number concentrations per water type, using Wilcoxon rank sum test, P value adjustment method: bonferroni. Statistically significant differences (p<0.05) are indicated in bold font.

	WWTP Influent	WWTP Effluent	Lake	River	Canal	Ground water	Untreated DWTP water	Treated Tap Water
WWTP EF	**0.00085**	-						
Lake	**<2E-16**	1						
River	**<2E-16**	**<2E-16**	<2E-16					
Canal	**5.6E-10**	**1.6E-8**	5.7E-8	1				
Groundwater	1	1	1	1	1			
U. DWTP water	1	1	**0.01194**	**9.5E-5**	**0.00188**	1		
T. Tap water	**<2E-16**	1	**1.3E-15**	**<2E-16**	**3.2E-8**	1	**0.00983**	
Bottled wat.	**2.8E-6**	**6.2E-6**	**<2E-16**	**<2E-16**	**1.6E-14**	1	**0.04146**	**<2E-16**

References

1. Anderson, P., Warrack, S., Langen, V., Challis, J., Hanson, M., & Rennie, M. (2017). Microplastic contamination in Lake Winnipeg, Canada. *Environmental Pollution, 225*, 223-231.
2. Baldwin, A., Corsi, S., & Mason, S. (2016). Plastic Debris in 29 Great Lakes Tributaries: Relations to Watershed Attributes and Hydrology. *Environmental Science and Technology, 50*(19), 10377-10385.
3. Browne, M., Crump, P., Niven, S., Teuten, E., Tonkin, A., Galloway, T., & Thompson, R. (2011). Accumulation of microplastic on shorelines woldwide: Sources and sinks. *Environmental Science and Technology, 45*(21), 9175-9179.
4. Cable, R., Beletsky, D., Beletsky, R., Wigginton, K., Locke, B., & Duhaime, M. (2017). Distribution and Modeled Transport of Plastic Pollution in the Great Lakes, the World's Largest Freshwater Resource. *Frontiers in Environmental Science, 5*.
5. Carr, S., Liu, J., & Tesoro, A. (2016). Transport and fate of microplastic particles in wastewater treatment plants. *Water Research, 91*, 174-182.
6. Di, M., & Wang, J. (2018). Microplastics in surface waters and sediments of the Three Gorges Reservoir, China. *Science of the Total Environment, 616-617*, 1620-1627.
7. Dris, R., Gasperi, J., Rocher, V., & Tassin, B. (2018). Synthetic and non-synthetic anthropogenic fibers in a river under the impact of Paris Megacity: Sampling methodological aspects and flux estimations. *Science of the Total Environment, 618*, 157-164.
8. Dris, R., Gasperi, J., Rocher, V., Saad, M., Renault, N., & Tassin, B. (2015). Microplastic contamination in an urban area: a case study in Greater Paris. *Environ. Chem., 12*(5), 592-599.
9. Dyachenko, A., Mitchell, J., & Arsem, N. (2017). Extraction and identification of microplastic particles from secondary wastewater treatment plant (WWTP) effluent. *Anal. Methods, 9*(9), 1412-1418.
10. Eriksen, M., Mason, S., Wilson, S., Box, C., Zellers, A., Edwards, W., . . . Amato, S. (2013). Microplastic pollution in the surface waters of the Laurentian Great Lakes. *Marine Pollution Bulletin, 77*(1-2), 177-182.
11. Estahbanati, S., & Fahrenfeld, N. (2016). Influence of wastewater treatment plant discharges on microplastic concentrations in surface water. *Chemosphere, 162*, 277-284.

12. Faure, F., Demars, C., Wieser, O., Kunz, M., & De Alencastro, L. (2015). Plastic pollution in Swiss surface waters: Nature and concentrations, interaction with pollutants. *Environmental Chemistry, 12*(5), 582-591.
13. Fischer, E., Paglialonga, L., Czech, E., & Tamminga, M. (2016). Microplastic pollution in lakes and lake shoreline sediments - A case study on Lake Bolsena and Lake Chiusi (central Italy). *Environmental Pollution, 213*, 648-657.
14. Free, C., Jensen, O., Mason, S., Eriksen, M., Williamson, N., & Boldgiv, B. (2014). High-levels of microplastic pollution in a large, remote, mountain lake. *Marine Pollution Bulletin, 85*(1), 156-163.
15. Hendrickson, E., Minor, E., & Schreiner, K. (2018). Microplastic Abundance and Composition in Western Lake Superior As Determined via Microscopy, Pyr-GC/MS, and FTIR. *Environmental Science and Technology, 52*(4), 1787-1796.
16. Hoellein, T., McCormick, A., Hittie, J., London, M., Scott, J., & Kelly, J. (2017). Longitudinal patterns of microplastic concentration and bacterial assemblages in surface and benthic habitats of an urban river. *Freshwater Science, 36*(3), 491-507.
17. Kosuth, M., Mason, S., & Wattenberg, E. (2018). Anthropogenic contamination of tap water, beer, and sea salt. *PLoS ONE, 13*(4).
18. Lahens, L., Strady, E., Kieu-Le, T., Dris, R., Boukerma, K., Rinnert, E., . . . Tassin, B. (2018). Macroplastic and microplastic contamination assessment of a tropical river (Saigon River, Vietnam) transversed by a developing megacity. *Environmental Pollution, 236*, 661-671.
19. Lares, M., Ncibi, M., Sillanpää, M., & Sillanpää, M. (2018). Occurrence, identification and removal of microplastic particles and fibers in conventional activated sludge process and advanced MBR technology. *Water Research, 133*, 236-246.
20. Leslie, H., Brandsma, S., van Velzen, M., & Vethaak, A. (2017). Microplastics en route: Field measurements in the Dutch river delta and Amsterdam canals, wastewater treatment plants, North Sea sediments and biota. *Environment International, 101*, 133-142.
21. Magnusson, K., & Norén, F. (2014). Screening of microplastic particles in and down-stream a wastewater treatment plant. *IVL Swedish Environmental Research Institute, C 55*, 22.
22. Mani, T., Hauk, A., Walter, U., & Burkhardt-Holm, P. (2015). Microplastics profile along the Rhine River. *Scientific Reports, 5*.
23. Mason, S., Garneau, D., Sutton, R., Chu, Y., Ehmann, K., Barnes, J., . . . Rogers, D. (2016). Microplastic pollution is widely detected in US municipal wastewater treatment plant effluent. *Environmental Pollution, 218*, 1045-1054.
24. Mason, S., Kammin, L., Eriksen, M., Aleid, G., Wilson, S., Box, C., . . . Riley, A. (2016). Pelagic plastic pollution within the surface waters of Lake Michigan, USA. *Journal of Great Lakes Research, 42*(4), 753-759.
25. Mason, S., Welch, V., & Neratko, J. (2018). *Synthetic polymer contamination in bottled water.*
26. McCormick, A., Hoellein, T., London, M., Hittie, J., Scott, J., & Kelly, J. (2016). Microplastic in surface waters of urban rivers: Concentration, sources, and associated bacterial assemblages. *Ecosphere, 7*(11).
27. McCormick, A., Hoellein, T., Mason, S., Schluep, J., & Kelly, J. (2014). Microplastic is an abundant and distinct microbial habitat in an urban river. *Environmental Science and Technology, 48*(20), 11863-11871.
28. Michielssen, M., Michielssen, E., Ni, J., & Duhaime, M. (2016). Fate of microplastics and other small anthropogenic litter (SAL) in wastewater treatment plants depends on unit processes employed. *Environmental Science: Water Research and Technology, 2*(6), 1064-1073.
29. Miller, R., Watts, A., Winslow, B., Galloway, T., & Barrows, A. (2017). Mountains to the sea: River study of plastic and non-plastic microfiber pollution in the northeast USA. *Marine Pollution Bulletin, 124*(1), 245-251.

30. Mintenig, S., Int-Veen, I., Löder, M., Primpke, S., & Gerdts, G. (2017). Identification of microplastic in effluents of waste water treatment plants using focal plane array-based micro-Fourier-transform infrared imaging. *Water Research, 108*, 365-372.
31. Mintenig, S., Löder, M., Primpke, S., & Gerdts, G. (2019). Low numbers of microplastics detected in drinking water from ground water sources. *Science of the Total Environment*.
32. Murphy, F., Ewins, C., Carbonnier, F., & Quinn, B. (2016). Wastewater Treatment Works (WwTW) as a Source of Microplastics in the Aquatic Environment. *Environmental Science and Technology, 50*(11), 5800-5808.
33. Oßmann, B., Sarau, G., Holtmannspötter, H., Pischetsrieder, M., Christiansen, S., & Dicke, W. (2018). Small-sized microplastics and pigmented particles in bottled mineral water. *Water Research*.
34. Pivokonsky, M., Cermakova, L., Novotna, K., Peer, P., Cajthaml, T., & Janda, V. (2018). Occurrence of microplastics in raw and treated drinking water. *Science of the Total Environment*.
35. Rodrigues, M., Abrantes, N., Gonçalves, F., Nogueira, H., Marques, J., & Gonçalves, A. (2018). Spatial and temporal distribution of microplastics in water and sediments of a freshwater system (Antuã River, Portugal). *Science of the Total Environment, 633*, 1549-1559.
36. Schymanski, D., Goldbeck, C., Humpf, H., & Fürst, P. (2018). Analysis of microplastics in water by micro-Raman spectroscopy: Release of plastic particles from different packaging into mineral water. *Water Research, 129*, 154-162.
37. Sighicelli, M., Pietrelli, L., Lecce, F., Iannilli, V., Falconieri, M., Coscia, L., . . . Zampetti, G. (2018). Microplastic pollution in the surface waters of Italian Subalpine Lakes. *Environmental Pollution, 236*, 645-651.
38. Simon, M., Alst, N., Vollertsen, J., Simon, M., van Alst, N., & Vollertsen, J. (2018). Quantification of microplastic mass and removal rates at wastewater treatment plants applying Focal Plane Array (FPA)-based Fourier Transform Infrared (FT-IR) imaging. *Water Research, 142*, 1-9.
39. Su, L., Xue, Y., Li, L., Yang, D., Kolandhasamy, P., Li, D., & Shi, H. (2016). Microplastics in Taihu Lake, China. *Environmental Pollution, 216*, 711-719.
40. Talvitie, J., Heinonen, M., Pääkkönen, J., Vahtera, E., Mikola, A., Setälä, O., & Vahala, R. (2015). Do wastewater treatment plants act as a potential point source of microplastics? Preliminary study in the coastal Gulf of Finland, Baltic Sea. *Water Science and Technology, 72*(9), 1495-1504.
41. Talvitie, J., Mikola, A., Koistinen, A., & Setälä, O. (2017). Solutions to microplastic pollution – Removal of microplastics from wastewater effluent with advanced wastewater treatment technologies. *Water Research, 123*, 401-407.
42. Talvitie, J., Mikola, A., Setï¿½lï¿½, O., Heinonen, M., & Koistinen, A. (2017). How well is microlitter purified from wastewater? – A detailed study on the stepwise removal of microlitter in a tertiary level wastewater treatment plant. *Water Research, 109*, 164-172.
43. Vermaire, J., Pomeroy, C., Herczegh, S., & Haggart, O. (2017). Microplastic abundance and distribution in the open water and sediment of the Ottawa River, Canada, and its tributaries. *Facets, 2*(1), 301-314.
44. Vollertsen, J., & Hansen, A. (2017). Microplastic in Danish wastewater Sources, occurrences and fate.
45. Wang, W., Ndungu, A., Li, Z., & Wang, J. (2017). Microplastics pollution in inland freshwaters of China: A case study in urban surface waters of Wuhan, China. *Science of the Total Environment, 575*, 1369-1374.
46. Wang, W., Yuan, W., Chen, Y., & Wang, J. (2018). Microplastics in surface waters of Dongting Lake and Hong Lake, China. *Science of the Total Environment, 633*, 539-545.
47. Xiong, X., Zhang, K., Chen, X., Shi, H., Luo, Z., & Wu, C. (2018). Sources and distribution of microplastics in China's largest inland lake – Qinghai Lake. *Environmental Pollution, 235*, 899-906.
48. Zhang, K., Gong, W., Lv, J., Xiong, X., & Wu, C. (2015). Accumulation of floating microplastics behind the Three Gorges Dam. *Environmental Pollution, 204*, 117-123.

49. Zhang, K., Xiong, X., Hu, H., Wu, C., Bi, Y., Wu, Y., . . . Liu, J. (2017). Occurrence and Characteristics of Microplastic Pollution in Xiangxi Bay of Three Gorges Reservoir, China. *Environmental Science and Technology, 51*(7), 3794-3801.
50. Ziajahromi, S., Neale, P., Rintoul, L., & Leusch, F. (2017). Wastewater treatment plants as a pathway for microplastics: Development of a new approach to sample wastewater-based microplastics. *Water Research, 112*, 93-99.

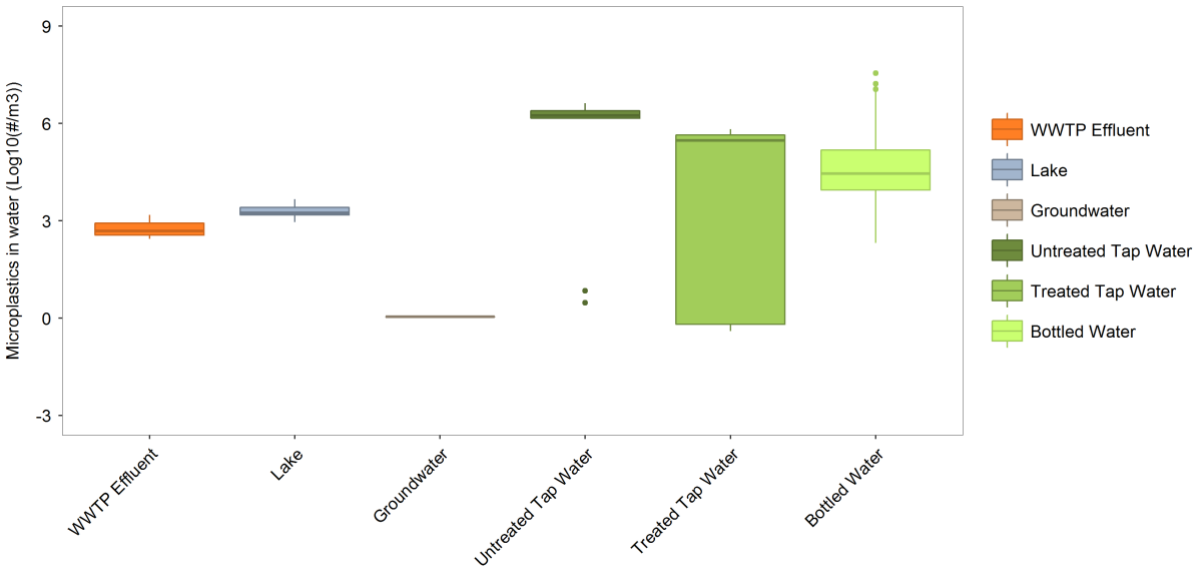

Figure S1. Box and whisker plot showing median and variation in microplastic number concentrations in individual samples taken from different water types. Data relate to individual samples unless only means were reported, in which case the mean value was taken into account n times, with n being the number of samples which the mean was based on. Only studies reporting number concentration with highest reliability scores were included (Wang et al. 2018; Mason et al., 2018; Ziajahromi et al. 2017). Additionally, data from four studies that only lacked positive controls were included (Ossman et al., 2018; Schymanski et al., 2018; Mintenig et al. 2019; Pivokonsky et al. 2018).