

Supplementary material

Microplastic in a stormwater pond

Kristina B. Olesen^a, Diana A. Stephansen^a, Nikki van Alst^a, Jes Vollertsen^a (2019)

^a *Department of Civil Engineering, Aalborg University, Denmark.*

Group name	Polymer included in the group
Acrylic	Acrylic Polyacrylonitrile (PAN Acrylic) Styrene acrylonitrile (SAN) Acrylic based paints
Others	Polyvinyl chloride (PVC) Polyvinyl alcohol (PVA) Polyvinyl acetate (PVAC) Polyurethane (PU) Polycarbonate Epoxy Ethylene vinyl acetate (EVA) Cellulose acetate PU based paints Alkyd based paints Silicone-based paints

Table S1: Major groups of the detected plastic materials containing different polymer materials.

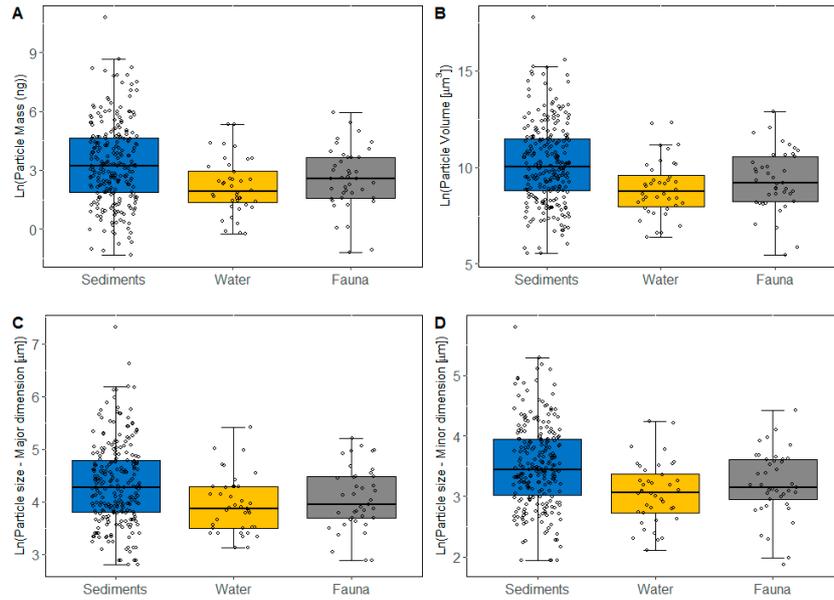


Figure S1: Boxplot of the microplastic particle mass (A), particle volume (B), particle size – major dimension (C) and particle size – minor dimension (D) in the sediments ($n=233$), water ($n=40$) and fauna ($n=41$) samples. The boundary of the box shows the 25th percentile and the 75th percentile, whereas the black line within the box marks the median. The length of the whiskers (error bars) represents the largest/smallest value within 1.5 interquartile range (IQR). Each hollow circle represents one of the identified MP. Data are plotted on a logarithmic scale.

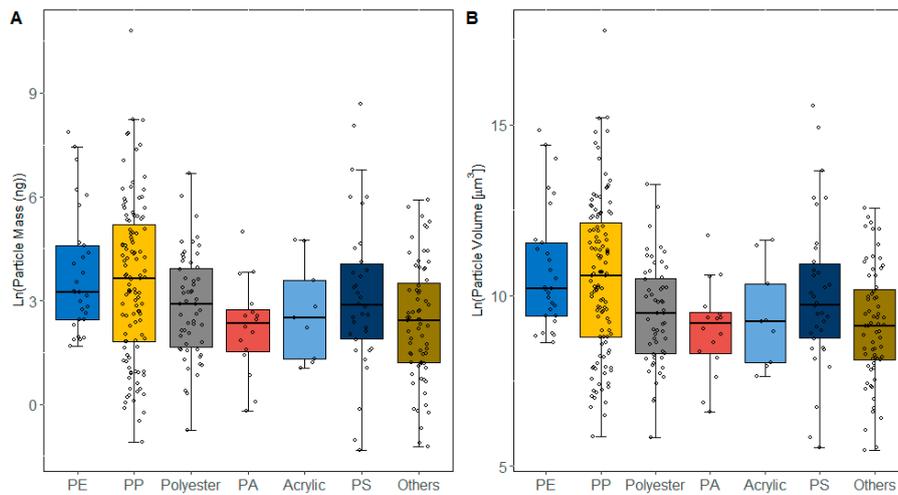


Figure S2: Boxplot of the grouped polymeric material with respect to particle mass (A) and particle volume (B). The boundary of the box shows the 25th percentile and the 75th percentile, whereas the black line within the box marks the median. The length of the whiskers (error bars) represents the largest/smallest value within 1.5 interquartile range (IQR). Each hollow circle represents one of the identified MP. Data are plotted on a logarithmic scale.

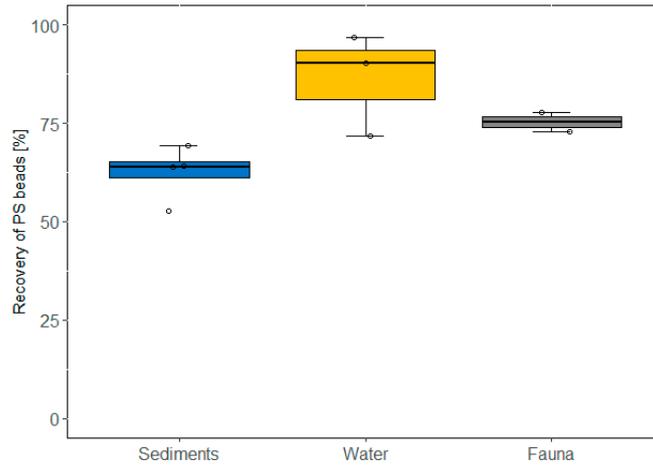


Figure S3: The recovery rates in percentage of 100 µm polystyrene beads from the sediments-protocol, water-protocol and fauna protocol. The beads were added to the sediments, water and fauna sample matrix and underwent the treatment described in the protocols. Microscopic analysis was used for the recovery experiments. The boundary of the box shows the 25th percentile and the 75th percentile, whereas the black line within the box marks the median. The length of the whiskers (error bars) represents the largest/smallest value within 1.5 interquartile range (IQR).

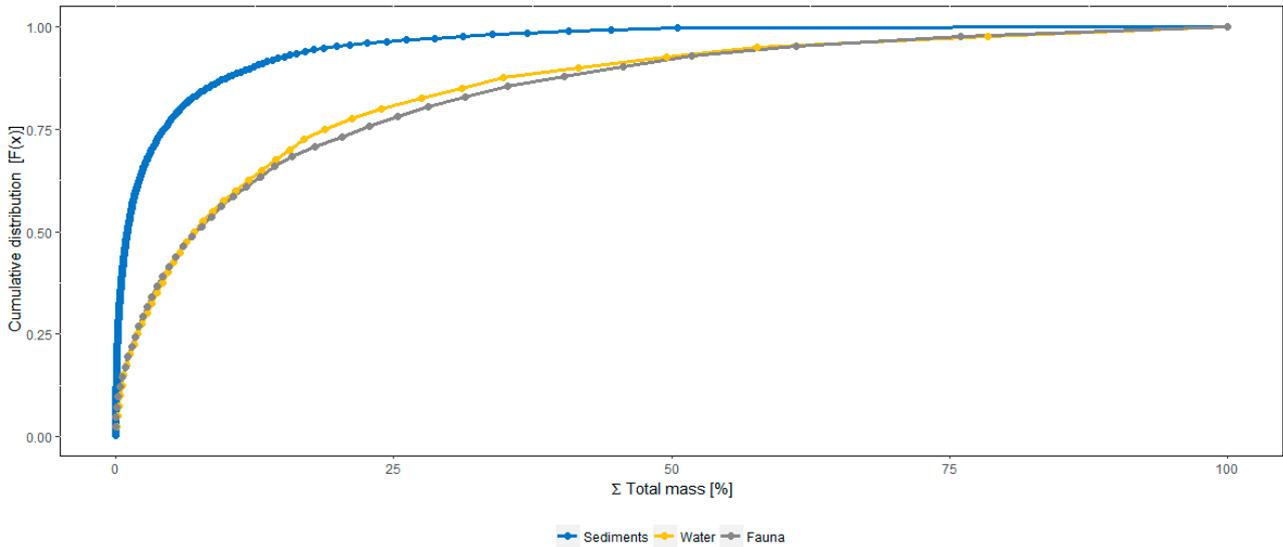


Figure S4: Cumulative particle distribution in sediments (blue), water (yellow) and fauna (grey) samples based on the summarised total particle mass. Each dot corresponds to a calculated microplastic particle mass, showing that one of the single particles detected in the sediments represents 50 % of the total mass whereas the single particle holding the largest mass in the water and fauna samples represent around 25 % of the total particle mass.

	Particle major dimension [μm]					Particle minor dimension [μm]				
	min	max	d10	d50	d90	min	max	d10	d50	d90
Sediments	16.5	1506.3	30.1	71.7	208.9	7.0	330.5	14.4	31.3	78.2
Water	22.9	224.9	28.2	47.4	107.8	8.2	69.8	10.1	21.0	35.3
Fauna	17.8	181.6	30.1	51.7	142.5	6.5	83.1	13.0	23.3	47.2
	Particle surface area [μm^2]					Particle volume [μm^3]				
	min	max	d10	d50	d90	min	max	d10	d50	d90
Sediments	90.8	390951.0	332.8	1784.8	11918.5	254.2	51677316	2001.3	22805.4	381941.5
Water	181.5	7986.0	142.0	756.3	3236.8	595.4	222815.8	1058.5	5589.9	56754.1
Fauna	90.8	11858	363	1089	4204.8	235.7	394295.2	2327.4	9850.8	70651.1
	Particle mass [ng]									
	min	max	d10	d50	d90					
Sediments	0.3	49093.5	2.3	25.2	397.2					
Water	0.8	211.7	1.3	6.6	66.2					
Fauna	0.3	374.6	3.2	13.1	81.9					

Table S2: Minimum (min), maximum (max), d10, d50 and d90 values of the cumulative distribution of the detected microplastic particles with respect to particle dimension (major and minor), surface area, volume and mass.

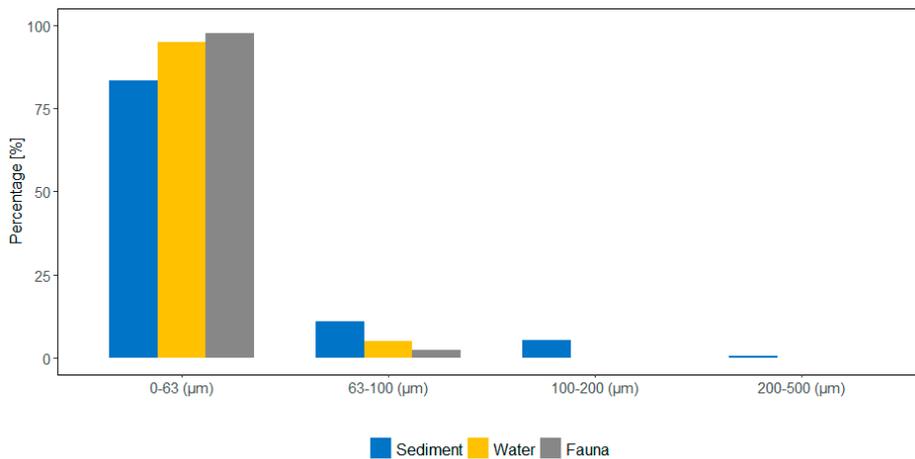


Figure S5: Abundance of microplastic particles in the size fraction smaller than 63 μm , 63-100 μm , 100-200 μm and 200-500 μm detected in the sediments, water and fauna samples with respect to the minor dimension of the microplastic particles.

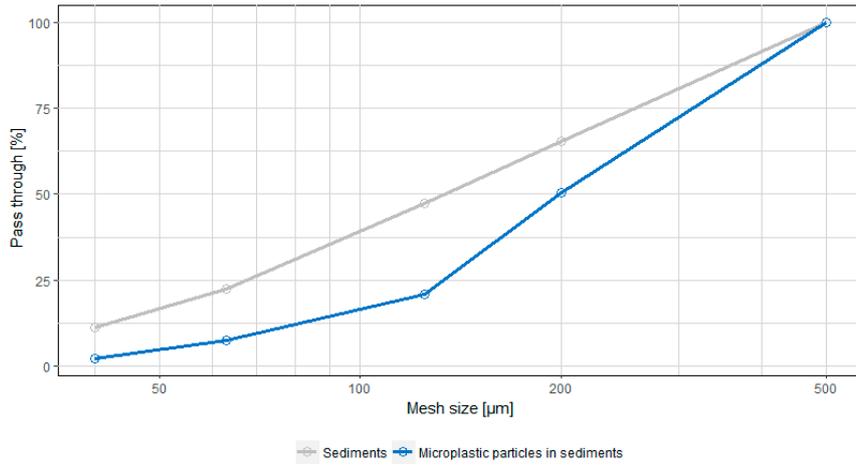


Figure S6: Comparison of the particle size distribution curve for the size fraction below 500 µm of the sediment (grey) and the microplastic particles detected in the sediment (blue). Data are plotted on a logarithmic scale.