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## Supplementary material for Manuscript “Micropollutants in Urban Stormwater Runoff of Different Land Uses”

### Tables

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### Figures

Figure S1: Schematic view of preparation of volume-proportional composite sample incorporating flow data measured in respective storm sewer during sampled rain event.

**Table S1.** List of monitored substances, analytical methods, and limit of quantification (LOQ).

Substance group	Substance	Device <sup>1</sup>	Method	Unit	LOQ
<b>Standard parameters</b>	BOD <sub>5</sub>		DIN EN 1899-1	mg L <sup>-1</sup>	3
	COD	photometric (cuvette)	DIN ISO15705	mg L <sup>-1</sup>	
	o-PO <sub>4</sub>	photometric	DIN EN 1189	mg L <sup>-1</sup>	0.01
	P (total)	ICP-AES	DIN EN ISO 11885	mg L <sup>-1</sup>	0.03
	TSS		DIN EN 872	mg L <sup>-1</sup>	
	NH <sub>4</sub> -N		DIN 38 406-E05-1	mg L <sup>-1</sup>	0.04
<b>Heavy metals</b>	Pb	ICP-AES or ICP-MSMS	DIN EN ISO 11885	µg L <sup>-1</sup>	10 or 0.5
	Cd	ICP-MSMS	DIN EN ISO 11885	µg L <sup>-1</sup>	0.05
	Cr	ICP-MSMS	DIN EN ISO 11885	µg L <sup>-1</sup>	0.2
	Cu	ICP-AES	DIN EN ISO 11885	µg L <sup>-1</sup>	10
	Ni	ICP-MSMS	DIN EN ISO 11885	µg L <sup>-1</sup>	0.5
	Ti	ICP-AES	DIN EN ISO 11885	µg L <sup>-1</sup>	2
	V	ICP-MSMS	DIN EN ISO 11885	µg L <sup>-1</sup>	0.1
	Zn	ICP-AES	DIN EN ISO 11885	µg L <sup>-1</sup>	15
<b>Tracer substances</b>	Caffeine	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.1
	Carbamazepine	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	Acesulfame	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.1
	FAA	LC-MSMS or LC-HRMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	Gabapentin	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.03
<b>Organophosphorus flame retardants (OPs)</b>	TBP	LC-HRMS	DIN 38407-F36	µg L <sup>-1</sup>	0.1
	TCEP	LC-HRMS	DIN 38407-F36	µg L <sup>-1</sup>	0.1
	TCP	LC-HRMS	DIN 38407-F36	µg L <sup>-1</sup>	0.1
	TDCP	LC-HRMS	DIN 38407-F36	µg L <sup>-1</sup>	0.1
	TBEP	LC-HRMS	DIN 38407-F36	µg L <sup>-1</sup>	0.1
<b>Phthalates</b>	Benzylbutylphthalate	GC-MSMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.3
	Dibutylphthalate	GC-MSMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.5
	Diethylphthalate	GC-MSMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.3
	Dimethylphthalate	GC-MSMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.3
	Dioctylphthalate	GC-MSMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.5
	DEHP	GC-MSMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.2
	DIDP + DINP	GC-MSMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.5
<b>Biocides/pesticides</b>	Carbendazim	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	Cybutryne	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	Diazinon	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	Diuron	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.03
	Tebuconazole	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	2,4-D	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	2,6-DCBA	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.03
	AMPA	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.1
	Glyphosate	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	Isoproturon	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.03
	Mecoprop	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	Terbutryn	LC-HRMS	DIN 38407-F36	µg L <sup>-1</sup>	0.01
	Thiacloprid	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.02
	DEET	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.04
	Imidacloprid	LC-HRMS	DIN 38407-F36	µg L <sup>-1</sup>	0.05
	Simazine	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.03
	Terbutylazine	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.03
	Desethylterbutylazine	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.03

Substance group	Substance	Device <sup>1</sup>	Method	Unit	LOQ
Industrial chemicals	BIT	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.03
	OIT	LC-MSMS	DIN 38407-F36	µg L <sup>-1</sup>	0.03
	Benzothiazole	LC-HRMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.05
	MTBT	LC-HRMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.05
	OH-Benzothiazole	LC-HRMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.02
	Benzotriazoles	LC-HRMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.05
	Tolyltriazoles	LC-HRMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.03
	PFOA	LC-HRMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.01
	PFOS	LC-HRMS	DIN EN ISO 18856	µg L <sup>-1</sup>	0.05
	Nonylphenols	GC-MS	DIN EN ISO 18857-2	µg L <sup>-1</sup>	5
	2-Phenylphenol	GC-MS	DIN EN ISO 18857-2	µg L <sup>-1</sup>	0.3
	4-tert-Octylphenol	GC-MS	DIN EN ISO 18857-2	µg L <sup>-1</sup>	0.4
	4-tert-Butylphenol	GC-MS	DIN EN ISO 18857-2	µg L <sup>-1</sup>	0.1
	Bisphenol F	GC-MS	DIN EN ISO 18857-2	µg L <sup>-1</sup>	0.3
Bisphenol A	GC-MS	DIN EN ISO 18857-2	µg L <sup>-1</sup>	0.2	
Fuel additive	MTBE			µg L <sup>-1</sup>	0.03
Other	Nicotine	LC-HRMS	DIN 38407-F36	µg L <sup>-1</sup>	0.2
Polycyclic aromatic hydrocarbons (PAHs)	Naphthalene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.05
	Acenaphthylene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.05
	Acenaphthene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.05
	Fluorene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Phenanthrene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Anthracene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Fluoranthene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Pyrene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Benzo[a]anthracene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Chrysene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Benzo[b]fluoranthene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Benzo[k]fluoranthene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Benzo[a]pyrene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.005
	Dibenz[a,h]anthracene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Benzo[g,h,i]perylene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Indeno[1,2,3-c,d]pyrene	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	PAH 16 EPA	GC-MSMS	DIN 38407-F39	µg L <sup>-1</sup>	0.01
	Organotin compounds	Monobutyltin			µg L <sup>-1</sup>
Dibutyltin				µg L <sup>-1</sup>	0.01
Tributyltin				µg L <sup>-1</sup>	0.01
Tetrabutyltin				µg L <sup>-1</sup>	0.01
Triphenyltin				µg L <sup>-1</sup>	0.01
Polybrominated diphenyl ethers (PBDEs)	BDE 28			µg L <sup>-1</sup>	0.01
	BDE 47			µg L <sup>-1</sup>	0.01
	BDE 99			µg L <sup>-1</sup>	0.01
	BDE 100			µg L <sup>-1</sup>	0.01
	BDE 153			µg L <sup>-1</sup>	0.01
	BDE 154			µg L <sup>-1</sup>	0.01
Polychlorinated biphenyls (PCBs)	Decabromodiphenyl ether			µg L <sup>-1</sup>	0.05
	Congener 28			µg L <sup>-1</sup>	0.05
	Congener 52			µg L <sup>-1</sup>	0.05
	Congener 101			µg L <sup>-1</sup>	0.05
	Congener 118			µg L <sup>-1</sup>	0.05

Substance group	Substance	Device <sup>1</sup>	Method	Unit	LOQ
	Congener 138			$\mu\text{g L}^{-1}$	0.05
	Congener 153			$\mu\text{g L}^{-1}$	0.05
	Congener 180			$\mu\text{g L}^{-1}$	0.05

orange coloured: never detected, therefore measurements were stopped after three months of monitoring.

<sup>1</sup>ICP-AES: Inductively Coupled Plasma - Atomic Emission Spectrometry

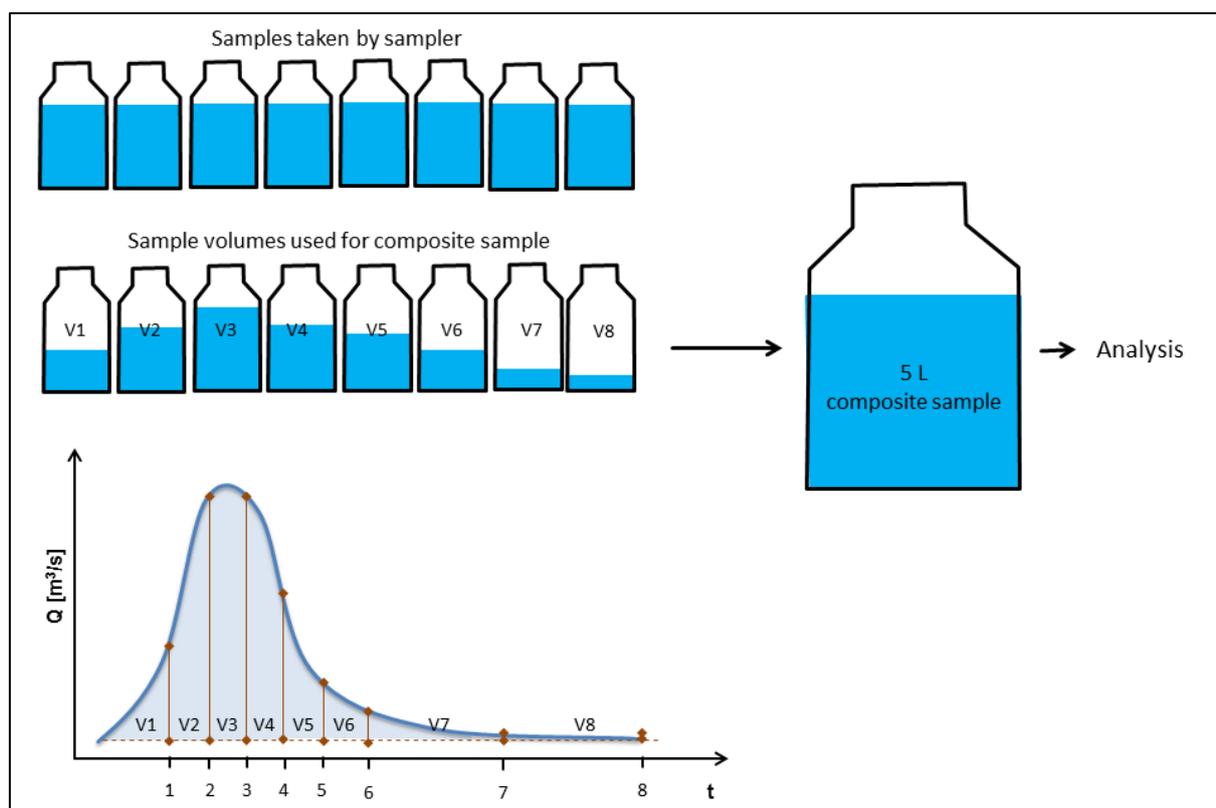
ICP-MSMS: Inductively Coupled Plasma – Tandem Mass Spectrometry

LC-MSMS: Liquid Chromatography – Tandem Mass Spectrometry

LC-HRMS: Liquid Chromatography – High Resolution Mass Spectrometry

GC-MS: Gas Chromatography – Mass Spectrometry

GC-MSMS: Gas Chromatography – Tandem Mass Spectrometry



**Figure S1.** Schematic view of preparation of volume-proportional composite sample incorporating flow data measured in respective storm sewer during sampled rain event.

**Table S2.** Results of Shapiro–Wilk test to test for normal distributions of concentrations per catchment type (prerequisite for application of analysis of variance (ANOVA)).

		p-values for normal distribution (ND) (Shapiro-Wilk Test)					
Compound		OLD	NEW	OFH	STR	COM	ND
<b>Metals</b>							
	Cu	0.00011	0.0068	0.65	0.0093	$1.7 \times 10^{-9}$	no
	Zn	0.000048	0.0024	0.0099	0.014	$3.5 \times 10^{-9}$	no
	Pb	0.000098	0.0072	0.73	0.0065	$3.6 \times 10^{-8}$	no
	Ti	0.00043	0.00021	0.26	0.021	$2.2 \times 10^{-9}$	no
	V	0.0025	0.0088	0.97	0.063	0.000015	no
	Cr	0.029	0.0046	0.16	0.022	0.0000024	no
	Ni	0.0066	0.0053	0.61	0.044	0.00012	no
	Cd	0.022	0.048	0.89	0.32	0.000088	no
<b>Tracer substances</b>							
	Caffeine	0.0059	0.053	0.031	0.000028	0.11	no
	Acesulfame	0.00078	-	0.0022	-	0.0000005	no
<b>Organophosphates</b>							
	TCPP	0.0045	0.22	-	0.0088	0.0000025	no
	TBEP	0.0086	0.0039	0.25	0.31	$1.3 \times 10^{-8}$	no
<b>Phthalates</b>							
	Diethylhexylphthalate	$6.8 \times 10^{-8}$	0.0051	0.039	0.00093	0.0000025	no
	DIDP + DINP	0.00019	0.029	0.62	0.0063	0.000018	no
<b>Biocides/Pesticides</b>							
	Mecoprop	0.00000037	0.0000081	0.0004	-	0.0000093	no
	Diuron	0.0011	-	0.013	-	-	no
	Carbendazim	0.00025	-	0.000027	-	0.0099	no
	Terbutryn	0.00082	-	0.0076	-	0.14	no
	Glyphosat	0.00000035	0.0013	0.0046	0.000015	0.00000022	no
<b>Industrial chemicals</b>							
<b>Benzothiazoles</b>							
	Benzothiazol	0.9	0.17	0.18	0.059	0.27	yes
	MTBT	0.00079	0.69	0.012	0.23	0.39	no
	Hydroxybenzothiazol	0.1	0.019	0.023	0.0049	0.044	no
<b>Benzotriazoles</b>							
	Benzotriazole	$4.9 \times 10^{-8}$	0.042	0.85	0.31	0.0046	no
	Tolyltriazoles	0.0000024	0.04	0.011	0.21	0.0000014	no
<b>PAH</b>							
	Chrysene	0.000011	0.000013	0.0085	0.93	0.21	no
	PAH 16 EPA	0.00021	0.0001	0.0037	0.076	0.13	no
	Benzo[a]pyrene	0.000018	-	0.00073	0.021	0.0018	no
	Benzo[a]anthracene	0.0028	0.0026	0.025	0.81	0.22	no
	Benzo[g,h,i]perylene	0.000047	-	0.00019	0.12	0.0013	no
	Pyrene	0.000037	0.000014	0.0021	0.018	0.022	no
	Benzo[k]fluoranthene	0.000051	-	-	0.018	0.00009	no
	Indeno[1,2,3-c,d]pyrene	0.013	0.0002	0.0059	0.083	0.13	no
	Anthracene	0.00023	-	-	0.0061	0.003	no
	Fluoranthene	0.000065	0.000024	0.0033	0.011	0.034	no
	Fluorene	0.0035	-	-	0.0014	-	no
	Dibenz[a,h]anthracene	0.000049	-	-	0.02	-	no
	Benzo[b]fluoranthene	0.0044	0.0026	0.042	0.83	0.77	no
	Phenanthrene	0.011	0.000062	0.0048	0.22	0.16	no
<b>Others</b>							
	Nicotine	0.00052	0.00014	-	0.0082	0.000023	no



**Table S4.** Overview of results of statistical analysis to evaluate the statistical significance of concentration differences. Red: concentrations significantly higher in comparison to at least 2 catchments, blue: concentrations significantly lower in comparison to at least 2 catchments.

	OLD	NEW	OFH	STR	COM
<b>Standard parameters</b>					
o-PO4-P	Red	Green	Red	Green	Blue
P	Red	Blue	Red	Red	Blue
COD	Green	Green	Green	Red	Green
TSS	Green	Green	Green	Red	Green
BOD	Green	Green	Green	Red	Green
<b>Metals</b>					
Cu	Blue	Blue	Green	Red	Red
Zn	Red	Blue	Blue	Green	Red
Pb	Green	Blue	Green	Green	Green
Ti	Green	Green	Green	Red	Green
V	Green	Green	Green	Red	Green
Cr	Green	Green	Green	Red	Green
Ni	Blue	Blue	Green	Red	Red
Cd	Blue	Blue	Green	Red	Red
<b>Tracer substances</b>					
Acesulfam	Red	Green	Green	Green	Red
Caffeine	Red	Blue	Blue	Green	Red
<b>Organophosphates</b>					
TCPP	Green	Green	Blue	Green	Green
TBEP	Green	Red	Blue	Blue	Red
<b>Phthalates</b>					
DEHP	Green	Blue	Blue	Red	Red
DIDP + DINP	Blue	Blue	Blue	Red	Red
<b>Pesticides/Biocides</b>					
Mecoprop	Red	Green	Green	Blue	Green
Diuron	Red	Blue	Red	Green	Green
AMPA	Green	Blue	Green	Green	Green
Carbendazim	Red	Blue	Red	Blue	Green
Terbutryn	Red	Blue	Red	Blue	Green
Isoproturon	Green	Green	Red	Green	Blue
Glyphosat	Green	Blue	Green	Green	Green
<b>Industrial chemicals</b>					
Hydroxybenzothiazole	Green	Green	Green	Red	Green
Tolyltriazole	Green	Green	Green	Red	Blue
PFOA	Red	Blue	Red	Blue	Red
Benzotriazole	Red	Green	Blue	Red	Blue
Benzo[thiazole]	Blue	Blue	Green	Red	Red
MTBT	Red	Blue	Red	Red	Blue
4-tert-Butylphenol	Green	Green	Green	Green	Green
<b>PAH</b>					
Chrysene	Red	Blue	Red	Red	Red
Sum of PAH 16	Red	Blue	Red	Red	Green
Benzo[a]pyrene	Red	Blue	Red	Red	Red
Benzo[a]anthracene	Red	Blue	Red	Red	Red
Benzo[g,h,i]perylene	Red	Blue	Red	Red	Green
Pyrene	Red	Blue	Red	Red	Green
Benzo[k]fluoranthene	Red	Blue	Red	Red	Red
Indeno[1,2,3-c,d]pyrene	Red	Blue	Red	Red	Red
Anthracene	Red	Blue	Red	Red	Green
Dibenz[a,h]anthracene	Green	Blue	Green	Green	Green
Fluoranthene	Red	Blue	Red	Red	Green
Fluorene	Red	Blue	Red	Red	Green
Benzo[b]fluoranthene	Green	Blue	Green	Green	Green
Phenanthrene	Red	Blue	Red	Red	Green