



Figure S1: Overview map of Karlsruhe: (a) the average content of dissolved oxygen of the multiple measurements [mg/l]; (b) contaminated sites of the soil protection and contaminated site register (Bodenschutz- und Altlastenkataster) of Karlsruhe (modified after Stadt Karlsruhe, 2006; Kühlers et al., 2012; Wickert et al., 2006); (c) average nitrate concentration [mg/l] of the repeated measurements; (d) iron concentration [mg/l] of the repeated measurements and (e) the phosphate concentration [mg/l] of the repeated measurements at the bottom of the measurement wells.

**Table S1: Well locations, information, sampled properties and result of the evaluation (GWT=groundwater temperature).**

Measuring point	Location	Area classification	Depth [m]	Average GWT [°C]	SD GWT [-]	Relative amount of detritus [-]	Average dissolved oxygen [mg/l]	Average GFI [-]	Amount crustaceans (acc. to UBA) [%]	Amount oligochaetes (acc. to UBA) [%]	Total amount of individuals [-]	Numbers of taxa [-]	Ecological condition (acc. to UBA)
T101	Lammstr. No.7	Urban area	39.0	14.4	0.05	3	0.97	0	0	0	0	0	Faunistic evaluation not possible
T102	Tulla Bad	Urban area	10.0	14.0	2.99	2	1.45	5	100	0	4	2	Natural
T104	Arbeitsamt - Rankestr.	Urban area	15.8	12.5	1.28	3	1.07	2	0	0	0	0	Faunistic evaluation not possible
T105	Fritz-Erlor-Str. No.21	Urban area	9.3	14.4	3.29	3	1.29	6	0	100	1	1	Faunistic evaluation not possible
T106	Schloßplatz / Schloßbezirk	Urban area	11.0	14.2	2.60	3	4.02	9	86	14	7	3	Natural
T123	Sophienstr. - Grillparzerstr.	Urban area	14.0	12.8	1.65	1	2.18	2	0	100	3	2	Affected
T124	Kaiserplatz	Urban area	13.0	14.9	1.95	3	1.97	5	0	0	2	1	Affected
T125	Kriegsstr. No.141	Urban area	11.8	15.0	2.32	1	3.64	4	0	100	103	3	Affected
T128	Südenstr. - Brauerstr.	Urban area	9.5	13.2	3.21	2	5.50	11	0	100	13	2	Affected
T129	Schule Beiertheim	Urban area	8.5	12.2	3.67	1	2.31	6	91	9	124	4	Natural
T320	Südbeckenstr. No.16	Urban area	9.0	12.6	3.43	1	2.62	6	0	100	252	1	Affected
T322	Rheinhafenbad	Urban area	10.0	15.9	2.99	2	3.45	8	0	100	6	2	Affected
T402	Am Fasanengarten - Parkstr.	Urban area	9.0	12.4	3.43	2	3.68	9	50	50	4	4	Affected
T411	Gewann Blösse	Urban area	10.9	11.3	2.64	3	5.74	11	0	100	34	2	Affected
T412	Theodor- Heuss - Allee	Urban area	10.0	11.4	2.99	1	4.47	6	100	0	6	4	Natural
T517	Auer Str. - Reichenbachstr.	Urban area	9.0	12.8	3.43	2	2.84	8	100	0	5	1	Natural
T524	Dornwaldstr.	Urban area	9.0	11.5	3.43	2	1.77	6	99	1	275	2	Natural
T401	Area next to the Wildpark-Stadion	Urban area	11.0	14.2	2.60	2	8.90	10	0	100	8	1	Affected
T109	Erzbergerstr.	Urban area	13.7	14.1	1.76	1	4.86	4	92	8	38	4	Natural
T108	Edgar-von-Gierke-Str. - Siegfried-Kühn-Str.	Urban area	12.0	14.9	2.26	2	6.12	8	79	21	25	4	Affected
T114	Allotment garden at the Alb	Urban area	12.8	15.4	2.01	1	8.25	6	13	88	171	4	Affected
T115	Sonnenstr. – Zietenstr.	Urban area	13.5	14.8	1.81	1	4.83	4	89	11	23	4	Natural
T117	Sonnenstr. – Zietenstr.	Urban area	13.0	17.0	1.95	3	6.24	8	92	8	74	4	Natural

T118	Schoemperlenstr.	Urban area	13.7	16.1	1.76	1	8.45	6	29	71	10	3	Affected
T112	Wattstr. – Annweilerstr.	Urban area	12.0	14.5	2.26	2	6.87	8	100	0	204	4	Natural
T111	Field near Kaiserslauterner-Str.	Urban area	8.9	13.4	3.48	3	5.75	14	77	23	96	4	Affected
T113	Hertzstr. – St. Barbara-Weg	Urban area	11.0	17.5	2.60	1	3.35	5	0	100	1	1	Affected
3Kalmi	Kalmitweg No.3	Urban area	15.5	15.3	1.34	1	6.44	3	77	23	13	3	Affected
2Windhor	Wilhelm-Windhorststr. - Schänzle	Urban area	15.2	15.8	1.34	2	8.64	6	20	80	353	4	Affected
1F-Lust-	Franz-Lust-Str. – Kußmaulstr.	Urban area	15.2	17.3	1.34	2	5.95	5	65	35	630	3	Affected
T107	Molkestr. – Willy-Brandt-Allee	Urban area	10.1	16.2	2.95	1	4.90	7	66	34	130	3	Affected
NOM-011		Forest area	14.9	10.7	1.47	1	3.42	3	100	0	15	1	Natural
NOM-017		Forest area	15.0	10.9	1.45	3	7.20	7	97	3	476	5	Natural
SOM-020		Forest area	15.0	10.7	1.45	1	5.81	3	50	50	9	4	Affected
SOM-018		Forest area	27.0	10.3	0.26	3	12.75	2	90	10	31	2	Natural
SWM-005	Hardtwald	Forest area	15.5	10.5	1.34	2	8.72	6	26	74	358	3	Affected
NWM-009		Forest area	15.0	10.8	1.45	2	10.69	7	43	57	90	4	Affected
NWM-006		Forest area	14.8	10.7	1.49	1	5.00	3	86	14	16	3	Natural
NOM-014		Forest area	15.0	10.5	1.45	1	9.92	5	67	33	23	3	Affected

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**Table S2: Taxa-site matrix of the invertebrate fauna of each water gauge.**

Official designation of the water gauges		T101	T102	T104	T105	T106	T123	T124	T125	T128	T129	T320	T322	T402	T411	T412	T517	T524	Number of individuals	Percentage	T401	T109	T108	
<i>Crustacea</i>	<i>Amphipoda</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	6	0	
	<i>Cyclopoida</i>	0	0	0	0	5	0	0	0	0	76	0	0	1	0	0	5	0	87	10	0	27	14	
	<i>Parastenocaris</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	
	<i>Bathynelleacea</i>	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	272	274	33	0	0	1
	<i>Nauplia</i>	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0
Amount <i>Crustacea</i>		0	2	0	0	6	0	0	0	0	77	0	0	1	0	3	5	272	366	44	0	33	15	
Amount <i>Crustacea</i> %		0	50	0	0	86	0	0	0	0	62	0	0	25	0	50	100	99			0	87	60	
Amount <i>Amphipoda</i> %		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0			0.0	15.8	0.0	
Amount <i>Cyclopoida</i> %		0.0	0.0	0.0	0.0	71.4	0.0	0.0	0.0	0.0	61.3	0.0	0.0	25.0	0.0	0.0	100.0	0.0			0.0	71.1	56.0	
Amount <i>Parastenocaris</i> %		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0			0.0	0.0	0.0	
Amount <i>Bathynelleacea</i> %		0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	98.9			0.0	0.0	4.0	
Amount <i>Nauplia</i> %		0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	
<i>Nematoda</i>		0	2	0	0	0	0	2	65	5	0	0	0	1	0	1	0	0	76	9	0	2	6	
<i>Oligochaeta</i>		0	0	0	1	1	2	0	37	8	8	252	3	1	33	0	0	3	349	42	8	3	4	
<i>Acari</i>		0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	
<i>Mikrurbellaria</i>		0	0	0	0	0	0	0	1	0	39	0	3	0	1	2	0	0	46	5	0	0	0	
Amount others		0	2	0	1	1	3	2	103	13	47	252	6	3	34	3	0	3	473	56	8	5	10	
Total amount		0	4	0	1	7	3	2	103	13	124	252	6	4	34	6	5	275	839	100	8	38	25	
Amount <i>Oligochaeta</i> %		0.0	0.0	0.0	100.0	14.3	66.7	0.0	35.9	61.5	6.5	100.0	50.0	25.0	97.1	0.0	0.0	1.1			100.0	7.9	16	
Amount <i>Nematoda</i> %		0.0	50.0	0.0	0.0	0.0	0.0	100.0	63.1	38.5	0.0	0.0	0.0	25.0	0.0	16.7	0.0	0.0			0.0	5.3	24	
Amount <i>Acari</i> %		0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0			0.0	0.0	0	
Amount <i>Microturbellaria</i> %		0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	31.5	0.0	50.0	0.0	2.9	33.3	0.0	0.0			0.0	0.0	0	

Official designation of the water gauges	T114	T115	T117	T118	T112	T111	T113	3Kalm itw	2Wind hor	1F- Lust-	T107	NOM- 011	NOM- 017	SOM- 020	SOM- 018	SWM- 005	NWM- 009	NWM- 006	NOM- 014	Number of individuals	Percentage	Number of all individuals	Percentage of all
<i>Amphipoda</i>	2	0	0	0	0	0	0	0	0	10	0	0	41	3	0	0	2	0	0	64	2.3	66	1.8
<i>Cyclopoida</i>	6	15	64	2	171	0	0	8	19	0	84	15	299	1	28	76	36	12	12	889	31.8	976	26.9
<i>Parastenocaris</i>	0	0	0	0	0	11	0	2	48	402	0	0	119	0	0	16	0	0	0	598	21.4	599	16.5
<i>Bathynelleacea</i>	0	2	1	0	31	62	0	0	0	0	0	0	0	0	0	0	0	0	0	97	3.5	371	10.2
<i>Nauplia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	2	0.1
Amount <i>Crustacea</i>	8	17	65	2	202	73	0	10	67	412	84	15	459	4	28	92	38	12	12	1648	59.0	2014	55.4
Amount <i>Crustacea</i> %	5	74	88	20	99	76	0	77	19	65	65	100	96	44	90	26	42	75	52				
Amount <i>Amphipoda</i> %	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	8.6	33.3	0.0	0.0	2.2	0.0	0.0				
Amount <i>Cyclopoida</i> %	3.5	65.2	86.5	20.0	83.8	0.0	0.0	61.5	5.4	0.0	64.6	100.0	62.8	11.1	90.3	21.2	40.0	75.0	52.2				
Amount <i>Parastenocaris</i> %	0.0	0.0	0.0	0.0	0.0	11.5	0.0	15.4	13.6	63.8	0.0	0.0	25.0	0.0	0.0	4.5	0.0	0.0	0.0				
Amount <i>Bathynelleacea</i> %	0.0	8.7	1.4	0.0	15.2	64.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Amount <i>Nauplia</i> %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
<i>Nematoda</i>	107	4	3	3	1	1	0	0	12	0	2	0	2	1	0	0	1	2	5	152	5.4	228	6.3
<i>Oligochaeta</i>	56	2	6	5	1	22	1	3	274	218	44	0	15	4	3	266	51	2	6	994	35.6	1343	37.0
<i>Acari</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	2	0.1
<i>Mikrurbellaria</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	46	1.3
Amount others	163	6	9	8	2	23	1	3	286	218	46	0	17	5	3	266	52	4	11	1146	41.0	1619	44.6
Total amount	171	23	74	10	204	96	1	13	353	630	130	15	476	9	31	358	90	16	23	2794	100.0	3633	100
Amount <i>Oligochaeta</i> %	32.7	8.7	8.1	50.0	0.5	22.9	100.0	23.1	77.6	34.6	33.8	0.0	3.2	44.4	9.7	74.3	56.7	12.5	26.1				
Amount <i>Nematoda</i> %	62.6	17.4	4.1	30.0	0.5	1.0	0.0	0.0	3.4	0.0	1.5	0.0	0.4	11.1	0.0	0.0	1.1	12.5	21.7				
Amount <i>Acari</i> %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Amount <i>Microturbellaria</i> %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				

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