



**Marie Skłodowska-Curie
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“HypoTRAIN”**

**Hyporheic Zone Processes – A training network for enhancing
the understanding of complex physical, chemical and
biological process interactions**

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Deliverable D2.2

**Validated rate measurements (C, N, P) in the HZ of natural streams incl.
focus sites**

Dissemination Level of Deliverable:

PU	Public	X
CO	Confidential, only for the members of the consortium (including the Commission Services)	

Validated rate measurements (C, N, P) in the HZ of natural streams incl. focus sites

At the same study sites introduced in D1.2 (“Data on origin of hyporheic water”), dissolved organic carbon (DOC), nitrate (NO_3^-), ammonium (NH_4^+) and phosphorous (P) were sampled from sediment pore water using one dialysis sampler (peeper, Fig. 1) per study site. The so-called peepers had seven chambers with a centre-to-centre separation of 5 cm (35 cm total length, vertical resolution of 5 cm). The capacity of each chamber was 20 ml. These devices were filled with deionized water and covered by a polysulfone membrane (dialysis membrane) with a pore size of 0.2 μm (HT-Tuffryn 200; Pall Gelman Laboratory). The peepers were deoxygenated in deionized water, using nitrogen gas for 24 h and were then installed parallel to the surface water flow direction in May 2016. Peepers were inserted vertically into the sediment to a depth of 30 cm with one chamber above the sediment in the free flowing water. Following the protocols, peepers were allowed to equilibrate with surrounding pore-water for 21 days. After this period, they were removed from the sediment. Water from the chambers was collected by piercing the membrane with a syringe. Samples were immediately filtered using cellulose acetate membrane syringe filters (0.45 μm) and preserved. Finally, water samples were analyzed in the laboratory using photometry and chromatography techniques. Concentrations of DOC, NO_3^- , NH_4^+ and P in mg/L are available in Table 1.



Figure 1. Left: Parts of the dialysis sampler (peeper). Middle: Image of the peeper after piercing the dialysis membrane. Right: Peeper installed in the riverbed.

Table 1. Concentration of dissolved organic carbon (DOC), nitrate (NO_3^-), ammonium (NH_4^+) and phosphorous (P) in mg/L at different sites and depths.

Site	Depth	hydrology	P	DOC	NH_4^+	NO_3^-
1	0	UW	0.70	9.67	0.71	5.11
1	5	UW	5.61	8.61	2.32	0.18
1	10	UW	6.05	9.19	2.30	0.16
1	15	UW	5.39	8.49	2.20	0.13
1	20	UW	5.12	8.31	2.10	0.15
1	25	UW	4.96	8.01	2.13	0.28
1	30	UW	5.16	8.22	2.16	0.13
2	0	DW	0.43	10.73	0.11	7.99
2	5	DW	0.41	9.42	0.22	1.07
2	10	DW	2.75	8.14	2.47	0.15
2	15	DW	4.25	8.77	3.11	0.15
2	20	DW	3.84	9.61	3.01	0.13
2	25	DW	3.83	12.84	3.09	0.10
2	30	DW	4.91	19.69	3.88	0.15
3	0	UW	0.42	11.36	0.11	8.05
3	5	UW	0.29	10.72	1.21	2.84
3	10	UW	2.72	15.63	4.88	0.11
3	15	UW	2.23	21.25	6.85	0.11
3	20	UW	2.30	21.28	8.19	0.10
3	25	UW	1.74	26.71	7.94	0.12
3	30	UW	2.11	33.10	7.49	0.12
4	0	DW	0.42	10.43	0.18	7.89
4	5	DW	0.48	9.69	0.06	3.40
4	10	DW	0.33	9.19	0.05	0.54
4	15	DW	0.42	8.86	0.10	0.57
4	20	DW	1.02	9.11	0.30	0.36
4	25	DW	3.16	10.60	0.74	0.00
4	30	DW	3.36	11.11	1.29	0.00
5	0	UW	0.40	11.26	0.17	7.77
5	5	UW	0.43	10.70	0.22	7.53
5	15	UW	2.21	11.32	3.90	0.14
5	20	UW	2.71	11.95	10.43	0.15
5	25	UW	3.57	15.22	14.92	0.13
5	30	UW	2.69	22.85	14.08	0.11
5	35	UW	2.51	28.20	16.52	0.11
6	0	DW	0.07	8.33	0.03	0.33
6	5	DW	0.29	7.14	0.46	0.00
6	10	DW	0.31	7.98	1.10	0.00
6	15	DW	1.20	8.97	1.33	0.00
6	20	DW	1.46	9.43	2.01	0.00
6	25	DW	1.75	10.23	3.35	0.00
6	30	DW	1.84	23.03	4.13	0.00