

- 1 Beyond aquatic and terrestrial: a multitaxon, large-scale perspective
- 2 reveals the distinct biodiversity of non-perennial rivers

3 López-Rojo et al.

4 SUPPLEMENTARY TABLES & FIGURES

5 **Supplementary Table 1.** Location and main characteristics of sampled NPR reaches, ordered alphabetically by
 6 country name. Temp. = mean annual air temperature; Precip. = mean annual precipitation.

Reach name	Country	Latitude WSG84	Longitude WSG84	Köppen class	Days since dry	Days since wetting	Distance to PR (km)	%NPR network	Precip. (mm)	Temp. (°C)
Chouly	Algeria	34.850	1.167	BSk	104	73	4.00	25	400	20.0
Boukiou		35.061	1.564	BSk	115	15	NA	80	250	22.0
Tafna		34.700	1.308	BSk	120	16	0.60	15	350	17.0
Dam	Australia	-32.148	116.123	Csa	NA	NA	1.20	80	900	22.6
Curtis Ck		-32.230	116.114	Csa	NA	NA	1.70	95	900	22.6
Seldom		-32.242	116.088	Csa	NA	NA	NA	95	900	22.6
G stream	Canada	49.269	-122.559	Cfb	60	250	0.15	4	3017	9.1
Gough Creek West		49.462	-123.634	Cfb	35	270	NA	75	2225	8.1
Zygos	Cyprus	34.781	32.941	Csa	30	240	6.00	57	435	20.0
Řička	Czechia	49.243	16.742	Dfb	7	202	0.32	10	600	8.0
Křtinský potok		49.293	16.723	Dfb	85	185	0.20	20	600	8.0
Járkovec		48.862	17.398	Dfb	20	222	0.70	100	550	10.0
Gránický potok		48.867	16.025	Dfb	27	202	1.00	10	550	10.0
Sudoměřický potok		48.845	17.316	Dfb	7	227	0.50	25	550	10.0
Candover Brook	United Kingdom	51.157	-1.155	Cfb	32	140	5.10	52	753	10.2
River Gade		51.794	-0.509	Cfb	10	180	0.40	20	724	10.2
Misbourne		51.698	-0.701	Cfb	30	90	3.00	50	817	10.1
Ver		51.784	-0.379	Cfb	20	150	6.17	48	704	10.8
Ingressin	France	48.662	5.766	Cfb	50	180	NA	23	NA	NA
Pantoux		48.678	5.820	Cfb	14	170	NA	NA	NA	NA
Campettine		42.285	9.227	Csa	22	128	0.06	100	995	12.3
Cuticci		42.323	9.149	Csa	29	140	0.26	100	995	12.3
Sorbellu		42.269	9.097	Csb	42	165	0.08	100	995	12.3
Hémilly		49.041	6.487	Cfb	60	145	4.37	100	800	10.9
Courbe Ligne Aval		48.442	7.063	Cfb	45	210	0.30	60	1100	9.7
Alme	Germany	51.621	8.658	Cfb	56	93	8.36	5	828	9.5
Demnitzer Millbrook		52.365	14.192	Cfb	57	171	2.00	90	500	9.5
Fredersdorfer Millbrook		52.499	13.721	Cfb	56	77	NA	80	500	9.5
Megyei	Hungary	46.106	18.029	Cfa	60	210	0.90	45	730	10.3
Sormás		46.135	17.999	Cfa	140	180	0.20	35	730	10.3
Ogna	Italy	45.939	10.006	Dfb	150	30	NA	100	1200	9.0
Colla		44.371	7.627	Csa	30	270	4.00	10	996	11.7
Varaita		44.584	7.522	Cfa	15	240	2.00	5	758	12.7

7 *Continuation Supplementary Table 1*

Reach name	Country	Latitude WSG84	Longitude WSG84	Köppen class	Days since dry	Days since wetting	Distance to PR (km)	%NPR network	Precip. (mm)	Temp. (°C)
Po	Italy	44.637	7.359	Cfa	15	240	1.00	5	1065	9.3
Sangone		45.023	7.511	Cfa	90	30	4.00	10	934	12.4
Pellice		44.829	7.368	Cfa	30	270	5.00	5	1130	12.2
Torrente Cosa		46.160	12.896	Cfa	14	276	3.71	67.5	1900	13.1
Emanon Stream	New Zealand	-43.291	171.715	Cfb	10	64	0.30	28	967	8.3
Lower Farm Stream		-43.007	171.805	Cfb	35	54	0.45	11	1700	9.1
Ribeira da Fórnea	Portugal	40.075	-8.248	Csb	91	34	2.55	100	1500	11.2
Ribeira da Pena		40.112	-8.143	Csb	100	30	0.61	100	1500	11.2
Ribeira Maior		40.125	-8.181	Csb	74	35	0.95	100	1500	11.2
Ribeira das Quelhas		40.069	-8.169	Csb	91	38	1.73	100	1500	8.7
Ribeira do Coentral Grande		40.072	-8.179	Csb	78	38	0.96	100	1500	8.7
Keiskama	South Africa	-32.714	27.019	Cfb	96	35	0.84	88.37	450	16.2
Kwelera		-32.845	28.000	Cfa	96	35	NA	72.73	352	25.0
Kowie		-33.369	26.690	BSh	126	45	NA	57.14	600	19.2
Ngubhu		-27.539	31.243	Cwa	150	45	NA	90	781	19.2
Thalu		-27.516	31.219	Cwa	150	45	NA	100	781	19.2
Sanana	Spain	41.620	1.912	Cfa	9	10	6.1	69	420	15.5
Artikutza		43.199	-1.805	Cfb	30	90	0.03	99	1327	11.6
Aizkorri		42.975	-2.391	Cfb	15	90	NA	95	1028	10.4
Parra		38.229	-1.090	BWk	45	90	0.50	90	325	18.0
Rogativa		38.123	-2.223	BSk	35	60	2.20	65	583	14.3
Serranos		37.941	-1.069	BWh	17	45	0.10	90	304	19.0
Cigüela		39.413	-3.310	BSk	47	153	12.00	30	402	15.6
Algars		40.896	0.250	BSk	34	270	4.00	32.3	500	12.5
Ternelles		39.894	2.997	Csa	100	117	NA	100	809	17.5

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Supplementary. Table 2. Significant indicator taxa among habitat combinations for each taxonomic group. Numbers indicate the count of taxa identified as indicative of... by indicator taxa analysis ($p < 0.05$, $IndVal$ statistic > 0.5). Percentages in parentheses represent the proportion of all significant indicator taxa within each taxonomic group. Aquatic reference includes taxa associated exclusively with PR. Aquatic affinity includes taxa shared between PR and one or more NPR habitats. NPR affinity include taxa restricted to NPR habitats (flowing, dry or both). Terrestrial affinity includes taxa shared between soil and one or more NPR habitats. Terrestrial reference includes taxa associated exclusively with soil.

	Aquatic ref	Aquatic affinity			NPR affinity			Terrestrial affinity			Terrestrial ref
Taxonomic group	PR	NPR flowing + PR	NPR dry + PR	NPR flowing + NPR dry + PR	NPR flowing	NPR flowing + NPR dry	NPR_dry	NPR dry + NPR flowing + Soil	NPR flowing + Soil	NPR dry + Soil	Soil
Invertebrates (morphologically)	7 (5%)	68 (47%)	0	2 (1%)	4 (3%)	0	12 (8%)	0	0	43 (29%)	10 (7%)
Invertebrates (eDNA)	69 (8%)	63 (8%)	24 (3%)	205 (25%)	13 (2%)	20 (2%)	13 (2%)	102 (12%)	31 (4%)	104 (13%)	178 (22%)
Meiofauna	9 (6%)	16 (10%)	9 (6%)	99 (65%)	5 (3%)	3 (2%)	1 (1%)	8 (5%)	2 (1%)	0	1 (1%)
Algae	11 (3%)	51 (14%)	23 (6%)	215 (59%)	14 (4%)	7 (2%)	1 (<1%)	28 (8%)	2 (1%)	8 (2%)	7 (2%)
Fungi	3 (1%)	9 (3%)	4 (1%)	28 (9%)	6 (2%)	9 (3%)	4 (1%)	115 (37%)	25 (8%)	65 (21%)	46 (15%)
Protozoa	26 (3%)	90 (12%)	18 (2%)	226 (29%)	12 (2%)	32 (4%)	20 (3%)	191 (25%)	25 (3%)	61 (8%)	69 (9%)
Archaea	5 (9%)	1 (2%)	8 (15%)	26 (47%)	0	1 (2%)	2 (4%)	4 (25%)	1 (2%)	5 (9%)	2 (4%)
Bacteria	118 (3%)	171 (5%)	174 (5%)	1401 (41%)	39 (1%)	57 (2%)	49 (1%)	908 (27%)	112 (3%)	152 (4%)	237 (7%)

19 **Supplementary Table 3.** Taxonomic assignment of the strongest indicator taxa identified by IndVal analysis ($p <$
20 0.05 , IndVal statistic [$stat$] > 0.5) for each taxonomic group and habitat or habitat combination. Taxa are shown
21 at the lowest taxonomic level assigned for each dataset. For habitat categories containing more than ten significant
22 indicator taxa with $stat > 0.5$, only the ten taxa with the highest indicator values are shown. NA: taxonomic level
23 not assigned

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Taxonomic group	Habitat	stat	Phylum/Division	Class	Order	Family
Invertebrates (morphology)	NPR dry+Soil	0.892	Arthropoda	Insecta	Hymenoptera	Formicidae
		0.809	Arthropoda	Insecta	Coleoptera	Carabidae
		0.802	Arthropoda	Insecta	Coleoptera	Staphylinidae
		0.675	Arthropoda	Arachnida	Araneae	Lycosidae
		0.588	Arthropoda	Arachnida	Araneae	Linyphiidae
		0.513	Arthropoda	Insecta	Orthoptera	Gryllidae
		0.500	Arthropoda	Arachnida	Araneae	Gnaphosidae
	NPR flowing + PR	0.939	Arthropoda	Insecta	Diptera	Chironomidae
		0.870	Arthropoda	Insecta	Ephemeroptera	Baetidae
		0.799	Arthropoda	Insecta	Diptera	Simuliidae
		0.798	Arthropoda	Insecta	Diptera	Ceratopogonidae
		0.731	Arthropoda	Insecta	Coleoptera	Elmidae
		0.706	Arthropoda	Insecta	Ephemeroptera	Leptophlebiidae
		0.692	Arthropoda	Insecta	Trichoptera	Hydropsychidae
		0.667	Arthropoda	Insecta	Ephemeroptera	Heptageniidae
		0.665	Arthropoda	Insecta	Trichoptera	Limnephilidae
		0.633	Arthropoda	Malacostraca	Amphipoda	Gammaridae
Invertebrates (eDNA)	NPR dry + NPR flowing + PR	0.793	Nematoda	Chromadorea	Monhysterida	Monhysteridae
		0.779	Annelida	Clitellata	Tubificida	NA
		0.777	Nematoda	Chromadorea	Monhysterida	Monhysteridae
		0.761	Annelida	Clitellata	Crassiclitellata	Aelosomatidae
		0.712	Nematoda	Chromadorea	Monhysterida	Monhysteridae
		0.698	Arthropoda	Hexanauplia	Harpacticoida	NA
		0.695	Annelida	Clitellata	Enchytraeida	Enchytraeidae
		0.694	Nematoda	Chromadorea	Monhysterida	Monhysteridae
		0.694	Annelida	Clitellata	NA	NA
		0.688	Platyhelminthes	Rhabditophora	Macrostomida	Macrostomidae
	NPR dry + NPR flowing + Soil	0.728	Arthropoda	Arachnida	Sarcoptiformes	Alicorhagiidae
		0.689	Arthropoda	Arachnida	Sarcoptiformes	NA
		0.671	Arthropoda	Collembola	Symphyleona	NA
		0.664	Nematoda	Enoplea	Enoplida	Alaimidae
		0.649	Arthropoda	Arachnida	Trombidiformes	Rhagidiidae
		0.644	Nematoda	Chromadorea	Rhabditida	NA
		0.627	Arthropoda	Arachnida	Trombidiformes	NA
		0.617	Arthropoda	Arachnida	Sarcoptiformes	NA
		0.610	Arthropoda	Collembola	Poduromorpha	Tullbergiidae
		0.603	Annelida	Clitellata	Enchytraeida	Enchytraeidae

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Taxonomic group	Habitat	stat	Phylum/Division	Class	Order	Family
Invertebrates (eDNA)	NPR dry + Soil	0.645	Arthropoda	Collembola	Entomobryomorpha	NA
		0.619	Arthropoda	Arachnida	Mesostigmata	Parasitidae
		0.615	Arthropoda	Arachnida	Trombidiformes	Cocceupodidae
		0.564	Arthropoda	Collembola	Entomobryomorpha	NA
		0.562	Arthropoda	Arachnida	Sarcoptiformes	NA
		0.559	Arthropoda	Arachnida	Mesostigmata	NA
		0.555	Arthropoda	Arachnida	Trombidiformes	Eupodidae
		0.548	Arthropoda	Arachnida	Trombidiformes	Cocceupodidae
		0.540	Annelida	Clitellata	Enchytraeida	Enchytraeidae
		0.535	Nematoda	Enoplea	Dorylaimida	Qudsianematidae
	Soil	0.604	Nematoda	Chromadorea	Rhabditida	Bunonematidae
		0.578	Arthropoda	Arachnida	Mesostigmata	Veigaiidae
		0.538	Arthropoda	Collembola	Poduromorpha	Tullbergiidae
		0.536	Nematoda	Enoplea	Dorylaimida	NA
		0.520	Arthropoda	Collembola	Poduromorpha	Tullbergiidae
		0.511	Annelida	Clitellata	NA	NA
		0.509	Nematoda	Chromadorea	Rhabditida	Aphelenchidae
		0.501	Arthropoda	Protura	Eosentomata	Eosentomidae
Meiofauna	NPR dry + NPR flowing + PR	0.829	Rotifera	Eurotatoria	Ploima	NA
		0.807	Gastrotricha	Gastrotricha	Chaetonotida	Chaetonotidae
		0.774	Gastrotricha	Gastrotricha	Chaetonotida	Chaetonotidae
		0.748	Gastrotricha	Gastrotricha	Chaetonotida	Chaetonotidae
		0.746	Gastrotricha	Gastrotricha	Chaetonotida	Chaetonotidae
		0.736	Gastrotricha	Gastrotricha	Chaetonotida	NA
		0.709	Gastrotricha	Gastrotricha	Chaetonotida	Chaetonotidae
		0.705	Gastrotricha	Gastrotricha	Chaetonotida	NA
		0.691	Gastrotricha	Gastrotricha	Chaetonotida	NA
		0.680	Rotifera	Eurotatoria	Ploima	Lepadellidae
	NPR dry + NPR flowing + Soil	0.547	Rotifera	Eurotatoria	NA	NA
		0.539	Rotifera	Eurotatoria	NA	NA
	NPR flowing + Soil	0.504	Tardigrada	Eutardigrada	Parachela	NA
Algae	NPR dry + NPR flowing + PR	0.781	Bacillariophyta	Bacillariophyceae	Cocconeidales	Achnanthidiaceae
		0.724	Bacillariophyta	Bacillariophyceae	Cymbellales	Gomphonemataceae
		0.709	Rhodophyta	Florideophyceae	Batrachospermales	NA
		0.683	Bacillariophyta	Bacillariophyceae	Cymbellales	Gomphonemataceae
		0.682	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae
		0.682	Bacillariophyta	Bacillariophyceae	Naviculales	Naviculaceae
		0.676	Bacillariophyta	Bacillariophyceae	Bacillariales	Bacillariaceae
		0.672	Ochrophyta	Chrysophyceae	Chromulinales	Paraphysomonadaceae
		0.671	Bacillariophyta	Bacillariophyceae	Bacillariales	Bacillariaceae
		0.667	Bacillariophyta	Bacillariophyceae	Mastogloiales	Achnanthaceae

Taxonomic group	Habitat	stat	Phylum/Division	Class	Order	Family
Algae	NPR dry + NPR flowing + Soil	0.693	Ochrophyta	Chrysophyceae	Chromulinales	Chromulinaceae
		0.688	Ochrophyta	Chrysophyceae	Chromulinales	
		0.683	Ochrophyta	Chrysophyceae	Chromulinales	Chromulinaceae
		0.663	Ochrophyta	Synurophyceae	Synurales	Mallomonadaceae
		0.622	Ochrophyta	Chrysophyceae	Chromulinales	Chromulinaceae
		0.619	Ochrophyta	Chrysophyceae	Chromulinales	Chromulinaceae
		0.615	Ochrophyta	Chrysophyceae	Chromulinales	Chromulinaceae
		0.567	Ochrophyta	Chrysophyceae	Chromulinales	Chromulinaceae
		0.560	Ochrophyta	Chrysophyceae	Chromulinales	Oikomonadaceae
		0.560	Dinoflagellata	Dinophyceae	NA	NA
	NPR flowing + PR	0.583	Bacillariophyta	Fragilariophyceae	Licmophorales	Ulnariaceae
		0.572	Bacillariophyta	Fragilariophyceae	Licmophorales	Ulnariaceae
		0.568	Ochrophyta	Chrysophyceae	Chromulinales	Paraphysomonadaceae
		0.543	Bacillariophyta	Coscinodiscophyceae	Melosirales	Stephanopyxidaceae
		0.535	Ochrophyta	Cryptophyceae	Cyathomonadacea	Goniomonadaceae
		0.503	Rhodophyta	Florideophyceae	Batrachospermales	NA
Fungi	NPR dry + NPR flowing + PR	0.668	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Alphamycetaceae
		0.577	Ascomycota	Leotiomycetes	Helotiales	Discinellaceae
		0.574	Chytridiomycota	Chytridiomycetes	Cladochytriales	Nowakowskiellaceae
		0.572	Chytridiomycota	Chytridiomycetes	Lobulomycetales	Lobulomycetaceae
		0.552	Chytridiomycota	Chytridiomycetes	Rhizophydiales	NA
		0.540	Chytridiomycota	Chytridiomycetes	Rhizophydiales	NA
		0.536	Chytridiomycota	Chytridiomycetes	Cladochytriales	Nowakowskiellaceae
		0.499	Chytridiomycota	Chytridiomycetes	Rhizophydiales	Halomycetaceae
		0.489	Chytridiomycota	Chytridiomycetes	Rhizophydiales	NA
		0.488	Chytridiomycota	Chytridiomycetes	Lobulomycetales	Lobulomycetaceae
	NPR dry + NPR flowing + Soil	0.761	Ascomycota	Orbiliomycetes	Orbiliales	Orbiliaceae
		0.679	Ascomycota	Dothideomycetes	Venturiales	NA
		0.668	Mucoromycota	Mucoromycetes	Mucorales	Mucoraceae
		0.666	Basidiomycota	Agaricomycetes	Agaricales	Pluteaceae
		0.663	Mucoromycota	Glomeromycetes	Glomerales	Glomeraceae
		0.659	Ascomycota	Sordariomycetes	Hypocreales	Ophiocordycipitaceae
		0.650	Ascomycota	Dothideomycetes	Venturiales	Sympoventuriaceae
		0.638	Ascomycota	Sordariomycetes	Xylariales	Xylariaceae
		0.637	Basidiomycota	Tremellomycetes	Filobasidiales	Filobasidiaceae
		0.625	Mucoromycota	Glomeromycetes	NA	NA
	NPR dry + Soil	0.617	Mucoromycota	Glomeromycetes	Glomerales	Glomeraceae
		0.502	Basidiomycota	Agaricomycetes	Agaricales	Clavariaceae

Taxonomic group	Habitat	stat	Phylum/Division	Class	Order	Family
Protozoa	NPR dry + NPR flowing + PR	0.776	Ciliophora	Spirotrichea	Urostylida	Holostichidae
		0.754	Ciliophora	Spirotrichea	Urostylida	Holostichidae
		0.709	Ciliophora	Spirotrichea	Sporadotrichida	Oxytrichidae
		0.706	Ciliophora	Litostomatea	Haptorida	Lacrymariidae
		0.676	Cercozoa	Sarcomonadea	Glissomonadida	Viridiraptoridae
		0.673	Ciliophora	Oligohymenophorea	Sessilida	NA
		0.673	Cercozoa	Imbricatea	Euglyphida	Cyphoderiidae
		0.666	Discosea	Flabellinia	Vannellida	Vannellidae
		0.661	Ciliophora	Oligohymenophorea	NA	NA
		0.657	Ciliophora	Litostomatea	Haptorida	Lacrymariidae
	NPR dry + NPR flowing + Soil	0.794	Cercozoa	Thecofilosea	Cryomonadida	Rhogostomidae
		0.780	Ciliophora	Colpodea	Cyrtolophosidida	Platyophryidae
		0.774	Ciliophora	Colpodea	Colpodida	Colpodidae
		0.767	Ciliophora	Spirotrichea	Sporadotrichida	Gonostomatidae
		0.754	Ciliophora	Colpodea	NA	NA
		0.744	Ciliophora	Colpodea	NA	NA
		0.736	Cercozoa	Sarcomonadea	Cercomonadida	Cercomonadidae
		0.734	Ciliophora	Colpodea	NA	NA
		0.734	Ciliophora	Colpodea	Cyrtolophosidida	Cyrtolophosididae
		0.728	Cercozoa	Thecofilosea	Cryomonadida	Rhogostomidae
Protozoa	NPR dry + Soil	0.674	Ciliophora	Colpodea	Colpodida	Colpodidae
		0.615	Ciliophora	Oligohymenophorea	Pleuronematida	Cyclidiidae
		0.602	Cercozoa	Imbricatea	Euglyphida	Euglyphidae
		0.597	Cercozoa	Imbricatea	Euglyphida	Euglyphidae
		0.595	Ciliophora	Litostomatea	Haptorida	Pseudoholophryidae
		0.588	Cercozoa	Imbricatea	Euglyphida	Euglyphidae
		0.534	Cercozoa	Thecofilosea	Cryomonadida	Rhogostomidae
		0.522	Cercozoa	Sarcomonadea	Cercomonadida	Cercomonadidae
		0.521	Ciliophora	Spirotrichea	Urostylida	Urostylidae
		0.507	Ciliophora	Colpodea	Cyrtolophosidida	NA
	NPR flowing + PR	0.610	Cercozoa	Thecofilosea	Tectofilosida	Chlamydophryidae
		0.599	Choanozoa	Choanoflagellata	Craspedida	Salpingoecidae
		0.585	Ciliophora	Oligohymenophorea	Sessilida	Vorticellidae
		0.572	Euglenozoa	Euglenida	Heteronematales	Lentomonadidae
		0.565	Ciliophora	Oligohymenophorea	Philasterida	Uronematidae
		0.562	Cercozoa	Thecofilosea	Tectofilosida	Chlamydophryidae
		0.560	Ciliophora	Heterotrichea	Heterotrichida	Stentoridae
		0.550	Ciliophora	Oligohymenophorea	Peniculida	Frontoniidae
		0.543	Ciliophora	Oligohymenophorea	Pleuronematida	NA
		0.538	Ciliophora	Oligohymenophorea	Hymenostomatida	NA

Taxonomic group	Habitat	stat	Phylum/Division	Class	Order	Family
Archaea	NPR dry + NPR flowing + PR	0.812	Nitrososphaerota	Nitrososphaeria	Nitrosopumilales	Nitrosopumilaceae
		0.703	Euryarchaeota	Methanobacteria	Methanobacteriales	Methanobacteriaceae
		0.684	Nitrososphaerota	Nitrososphaeria	Nitrosopumilales	Nitrosopumilaceae
		0.646	Euryarchaeota	Methanomicrobia	NA	NA
		0.644	Nitrososphaerota	Nitrososphaeria	Candidatus Nitrosocaldales	Candidatus Nitrosocaldaceae
		0.622	Thermoproteota	Thermoprotei	Thermofilales	Thermofilaceae
		0.613	Thermoproteota	Thermoprotei	Thermofilales	Thermofilaceae
		0.600	Candidatus Thermoplasmatota	Thermoplasmata	Methanomassiliicoccales	Methanomassiliicoccaeae
	NPR dry + NPR flowing + Soil	0.637	Candidatus Thermoplasmatota	Thermoplasmata	Methanomassiliicoccales	Methanomassiliicoccaeae
		0.599	Candidatus Thermoplasmatota	Thermoplasmata	Methanomassiliicoccales	Methanomassiliicoccaeae
		0.568	Candidatus Thermoplasmatota	Thermoplasmata	Methanomassiliicoccales	Methanomassiliicoccaeae
Bacteria	NPR dry + NPR flowing + PR	0.858	Pseudomonadota	Alphaproteobacteria	Rhodobacterales	Paracoccaceae
		0.850	Pseudomonadota	Alphaproteobacteria	Rhodobacterales	Paracoccaceae
		0.846	Thermodesulfobacteriota	Desulfuromonadia	Geobacterales	Geobacteraceae
		0.842	Actinomycetota	Acidimicrobiia	Acidimicrobiales	NA
		0.841	Pseudomonadota	Alphaproteobacteria	Rhodobacterales	Paracoccaceae
		0.832	Actinomycetota	Thermoleophilia	Miltoncostaeales	Miltoncostaeaceae
		0.831	Pseudomonadota	Alphaproteobacteria	Hyphomicrobiales	Hyphomicrobiaceae
		0.830	Actinomycetota	Actinomycetes	Sporichthyales	Sporichthyaceae
		0.827	Pseudomonadota	Alphaproteobacteria	Hyphomicrobiales	NA
	NPR dry + NPR flowing + Soil	0.782	Actinomycetota	Thermoleophilia	Solirubrobacterales	NA
		0.778	Pseudomonadota	Alphaproteobacteria	Hyphomicrobiales	Hyphomicrobiaceae
		0.778	Bacteroidota	Chitinophagia	Chitinophagales	Chitinophagaceae
		0.767	Pseudomonadota	Gammaproteobacteria	Steroidobacterales	Steroidobacteraceae
		0.762	Actinomycetota	Actinomycetes	Micrococcales	Micrococcaceae
		0.752	Bacteroidota	Chitinophagia	Chitinophagales	Chitinophagaceae
		0.751	Pseudomonadota	Alphaproteobacteria	Hyphomicrobiales	Reyraneliaceae
		0.745	Verrucomicrobiota	Spartobacteria	Chthoniobacterales	Chthoniobacteraceae

36 **Supplementary Table 4.** Results of linear mixed-effects models testing the overall effect of environmental variables
37 on position and deviation of NPR flowing- and dry-phase communities along the aquatic–terrestrial continuum.
38 Sum Sq: sum of squares; Mean Sq: mean square; MunDF: numerator degrees of freedom; DenDF: denominator
39 degrees of freedom; F value: F test value; Pr(>F): p-value associated with the F test

		Position NPR flow						Deviation NPR flow					
		Sum Sq	Mean Sq	Num DF	Den DF	F value	Pr(>F)	Sum Sq	Mean Sq	Num DF	Den DF	F value	Pr(>F)
Days since rewetting	Days since	0.115	0.115	1	53	6.495	0.014	0.038	0.038	1	53	4.354	0.042
	Group	1.682	0.240	7	366	13.533	0.000	0.778	0.111	7	366	12.619	0.000
	Days since:Group	0.205	0.029	7	366	1.649	0.120	0.206	0.029	7	366	3.341	0.002
Distance to PR	Distance	0.045	0.045	1	43	2.657	0.110	0.008	0.008	1	43	0.916	0.344
	Group	1.680	0.240	7	298	14.186	0.000	1.050	0.150	7	298	17.575	<2e-16
	Distance:Group	0.293	0.042	7	298	2.472	0.018	0.085	0.012	7	298	1.417	0.198
%NPR network	%NPR	0.062	0.062	1	55	3.625	0.062	0.021	0.021	1	55	2.317	0.134
	Group	2.238	0.320	7	381	18.668	0.000	0.739	0.106	7	381	11.477	0.000
	%NPR:Group	0.856	0.122	7	381	7.137	0.000	0.067	0.010	7	381	1.037	0.405
Temperature	Temperature	0.029	0.029	1	54	1.612	0.210	0.186	0.186	1	54	21.314	0.000
	Group	1.342	0.192	7	375	10.811	0.000	0.428	0.061	7	375	7.011	0.000
	Temp:Group	0.554	0.079	7	375	4.461	0.000	0.266	0.038	7	375	4.354	0.000
Precipitation	Precipitation	0.031	0.031	1	54	1.643	0.205	0.167	0.167	1	54	19.191	0.000
	Group	1.540	0.220	7	375	11.523	0.000	1.326	0.189	7	375	21.727	0.000
	Prec:Group	0.041	0.006	7	375	0.303	0.952	0.264	0.038	7	375	4.334	0.000

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		Position NPR dry						Deviation NPR dry					
		Sum Sq	Mean Sq	Num DF	Den DF	F value	Pr(>F)	Sum Sq	Mean Sq	Num DF	Den DF	F value	Pr(>F)
Days since dry	Days since	0.014	0.014	1	53	0.710	0.403	0.029	0.029	1	53	2.926	0.093
	Group	2.898	0.414	7	366	21.729	0.000	0.829	0.118	7	366	11.854	0.000
	Days since:Group	0.373	0.053	7	366	2.793	0.008	0.088	0.013	7	366	1.254	0.273
Distance to PR	Distance	0.047	0.047	1	43	2.184	0.147	0.016	0.016	1	43	1.985	0.166
	Group	3.604	0.515	7	298	23.708	0.000	0.933	0.133	7	298	16.199	0.000
	Distance:Group	0.152	0.022	7	298	1.001	0.430	0.091	0.013	7	298	1.577	0.142
%NPR network	%NPR	0.061	0.061	1	55	2.807	0.100	0.036	0.036	1	55	3.428	0.069
	Group	2.075	0.296	7	380	13.744	0.000	0.804	0.115	7	380	10.965	0.000
	%NPR:Group	0.231	0.033	7	380	1.531	0.155	0.041	0.006	7	380	0.555	0.792
Temperature	Temperature	0.011	0.011	1	54	0.553	0.460	0.362	0.362	1	54	34.716	0.000
	Group	2.098	0.300	7	374	14.919	0.000	0.284	0.041	7	374	3.884	0.000
	Temp:Group	0.826	0.118	7	374	5.876	0.000	0.084	0.012	7	374	1.155	0.328
Precipitation	Precipitation	0.005	0.005	1	54	0.210	0.648	0.214	0.214	1	54	21.261	0.000
	Group	1.236	0.177	7	374	8.035	0.000	1.299	0.186	7	374	18.479	0.000
	Prec:Group	0.120	0.017	7	374	0.778	0.606	0.232	0.033	7	374	3.297	0.002

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Supplementary Table 5. Results of linear models testing the taxon-specific effect of environmental variables on position and deviation of NPR communities in flowing and dry conditions. Df: degrees of freedom; Sum Sq: sum of squares; Mean Sq: mean square; F value: F test value; Pr(>F): p-value associated with the F test

		Position NPR flow					Deviation NPR flow				
		Df	Sum Sq	Mean Sq	F value	Pr(>F)	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Days since wetting	Inverts eDNA	1	0.196	0.196	10.957	0.002	1	0.080	0.080	5.533	0.022
	Inverts morpho	1	0.008	0.008	1.290	0.262	1	0.010	0.010	0.602	0.442
	Meiofauna	1	0.361	0.361	15.895	0.000	1	0.244	0.244	13.150	0.001
	Algae	1	0.089	0.089	3.584	0.064	1	0.009	0.009	0.563	0.456
	Fungi	1	0.054	0.054	2.804	0.100	1	0.000	0.000	0.015	0.904
	Protozoa	1	0.105	0.105	5.639	0.021	1	0.000	0.000	0.002	0.962
	Bacteria	1	0.131	0.131	4.321	0.042	1	0.023	0.023	2.407	0.127
	Archaea	1	0.010	0.010	0.100	0.753	1	0.082	0.082	4.155	0.047
	Inverts eDNA	1	0.195	0.195	11.124	0.002	1	0.018	0.018	1.212	0.276
	Inverts morpho	1	0.002	0.002	0.327	0.570	1	0.000	0.000	0.000	0.993
	Meiofauna	1	0.458	0.458	17.183	0.000	1	0.092	0.092	4.372	0.041
	Algae	1	0.131	0.131	4.547	0.037	1	0.032	0.032	1.944	0.169
	Fungi	1	0.083	0.083	4.477	0.039	1	0.007	0.007	0.591	0.445
	Protozoa	1	0.064	0.064	3.377	0.072	1	0.002	0.002	0.159	0.691
	Bacteria	1	0.158	0.158	5.158	0.027	1	0.010	0.010	1.066	0.306
	Archaea	1	0.216	0.216	2.306	0.135	1	0.038	0.038	1.920	0.171
	Inverts eDNA	1	0.003	0.003	0.180	0.674	1	0.002	0.002	0.171	0.681
	Inverts morpho	1	0.009	0.009	1.866	0.180	1	0.045	0.045	3.097	0.086
	Meiofauna	1	0.013	0.013	0.423	0.519	1	0.000	0.000	0.014	0.908
	Algae	1	0.029	0.029	1.180	0.284	1	0.037	0.037	2.180	0.147
	Fungi	1	0.062	0.062	3.327	0.075	1	0.001	0.001	0.111	0.741
	Protozoa	1	0.056	0.056	3.141	0.083	1	0.030	0.030	2.837	0.099
	Bacteria	1	0.056	0.056	1.832	0.183	1	0.005	0.005	0.444	0.509
	Archaea	1	0.354	0.354	4.557	0.039	1	0.012	0.012	0.581	0.450
	Inverts eDNA	1	0.054	0.054	2.640	0.110	1	0.188	0.188	15.421	0.000
	Inverts morpho	1	0.000	0.000	0.000	0.998	1	0.001	0.001	0.037	0.848
	Meiofauna	1	0.402	0.402	14.549	0.000	1	0.437	0.437	29.596	0.000
	Algae	1	0.148	0.148	5.207	0.026	1	0.226	0.226	17.073	0.000
	Fungi	1	0.021	0.021	1.053	0.309	1	0.027	0.027	2.168	0.147
	Protozoa	1	0.001	0.001	0.060	0.808	1	0.084	0.084	8.544	0.005
	Bacteria	1	0.031	0.031	0.928	0.340	1	0.131	0.131	16.939	0.000
	Archaea	1	0.102	0.102	1.081	0.303	1	0.085	0.085	4.534	0.038
Precipitation	Inverts eDNA	1	0.052	0.052	2.530	0.118	1	0.310	0.310	31.161	0.000
	Inverts morpho	1	0.010	0.010	1.773	0.189		0.032	0.032	2.203	0.144
	Meiofauna	1	0.000	0.000	0.008	0.931	1	0.250	0.250	13.684	0.001
	Algae	1	0.023	0.023	0.756	0.389	1	0.189	0.189	13.590	0.001
	Fungi	1	0.057	0.057	2.974	0.090	1	0.107	0.107	9.877	0.003
	Protozoa	1	0.021	0.021	1.036	0.313	1	0.116	0.116	12.441	0.001
	Bacteria	1	0.046	0.046	1.383	0.245	1	0.104	0.104	12.614	0.001
	Archaea	1	0.042	0.042	0.442	0.509	1	0.003	0.003	0.170	0.682

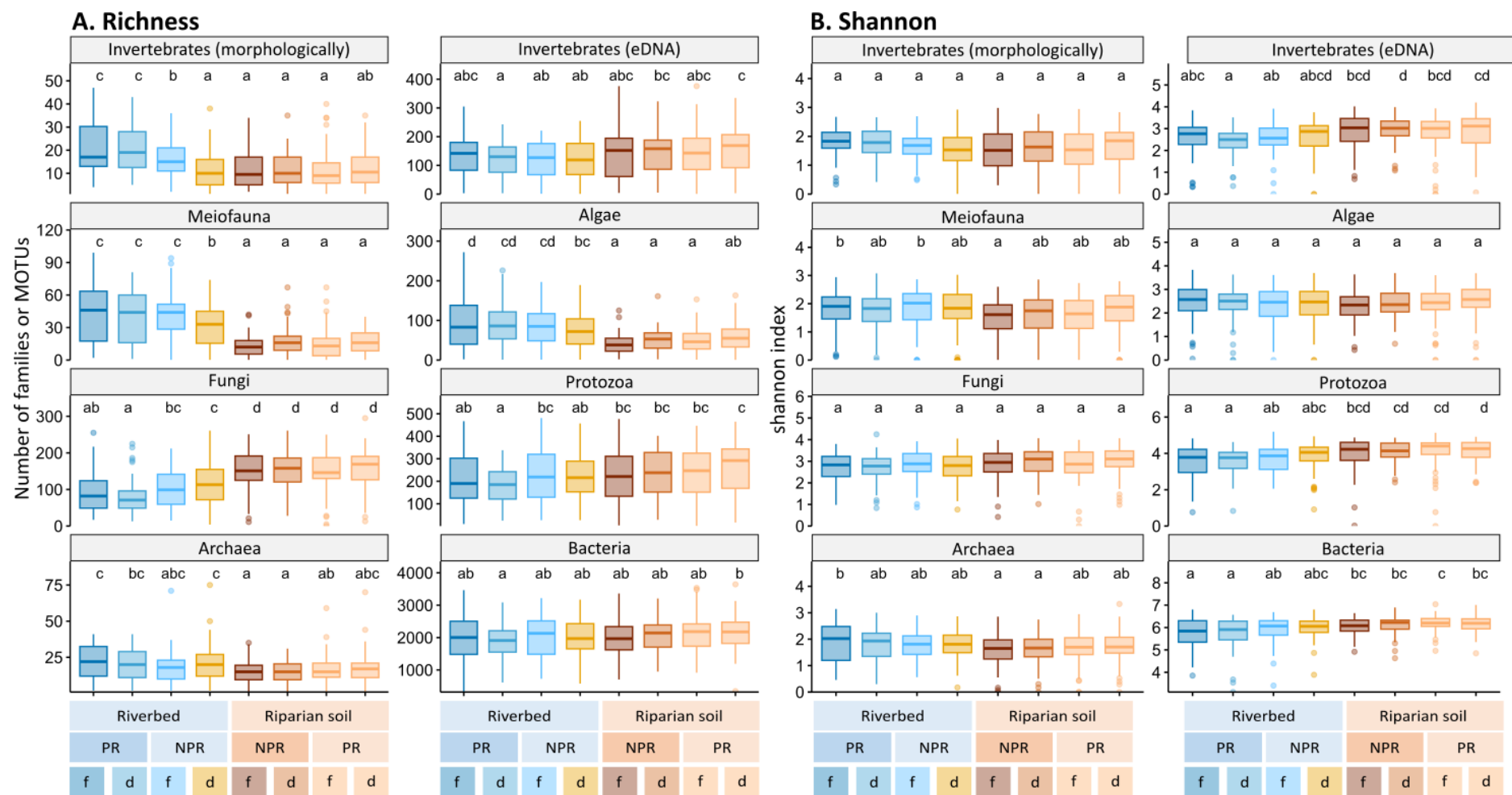
		Position NPR dry					Deviation NPR dry				
		Df	Sum Sq	Mean Sq	F value	Pr(>F)	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Days since dry	Inverts eDNA	1	0.071	0.071	2.531	0.118	1	0.085	0.085	6.170	0.016
	Inverts morpho	1	0.002	0.002	0.151	0.699	1	0.030	0.030	1.886	0.176
	Meiofauna	1	0.315	0.315	6.762	0.012	1	0.097	0.097	4.314	0.043
	Algae	1	0.005	0.005	0.130	0.720	1	0.000	0.000	0.001	0.975
	Fungi	1	0.008	0.008	0.345	0.560	1	0.002	0.002	0.132	0.718
	Protozoa	1	0.026	0.026	0.964	0.331	1	0.020	0.020	1.905	0.173
	Bacteria	1	0.039	0.039	0.879	0.353	1	0.007	0.007	0.773	0.383
	Archaea	1	0.036	0.036	0.413	0.523	1	0.008	0.008	0.341	0.562
	Inverts eDNA	1	0.046	0.046	1.566	0.218	1	0.020	0.020	1.686	0.201
	Inverts morpho	1	0.002	0.002	0.158	0.694	1	0.014	0.014	1.063	0.309
	Meiofauna	1	0.018	0.018	0.333	0.567	1	0.077	0.077	4.918	0.032
	Algae	1	0.064	0.064	1.646	0.206	1	0.030	0.030	2.631	0.112
	Fungi	1	0.082	0.082	3.861	0.056	1	0.003	0.003	0.277	0.602
	Protozoa	1	0.071	0.071	3.076	0.087	1	0.026	0.026	2.833	0.100
	Bacteria	1	0.169	0.169	3.824	0.057	1	0.003	0.003	0.349	0.558
	Archaea	1	0.072	0.072	0.730	0.398	1	0.012	0.012	0.548	0.463
NPR network %	Inverts eDNA	1	0.255	0.255	10.247	0.002	1	0.025	0.025	1.728	0.194
	Inverts morpho	1	0.001	0.001	0.093	0.762	1	0.001	0.001	0.061	0.807
	Meiofauna	1	0.206	0.206	4.046	0.049	1	0.074	0.074	3.467	0.068
	Algae	1	0.020	0.020	0.513	0.477	1	0.026	0.026	1.511	0.224
	Fungi	1	0.087	0.087	3.884	0.054	1	0.012	0.012	0.899	0.347
	Protozoa	1	0.019	0.019	0.718	0.400	1	0.010	0.010	0.940	0.337
	Bacteria	1	0.107	0.107	2.441	0.124	1	0.017	0.017	1.832	0.181
	Archaea	1	0.002	0.002	0.017	0.898	1	0.063	0.063	2.591	0.113
Distance to PR	Inverts eDNA	1	0.036	0.036	1.381	0.245	1	0.315	0.315	36.913	0.000
	Inverts morpho	1	0.043	0.043	2.848	0.098	1	0.101	0.101	6.312	0.015
	Meiofauna	1	0.585	0.585	13.573	0.001	1	0.250	0.250	14.385	0.000
	Algae	1	0.027	0.027	0.683	0.412	1	0.129	0.129	8.405	0.005
	Fungi	1	0.001	0.001	0.052	0.820	1	0.045	0.045	3.635	0.062
	Protozoa	1	0.026	0.026	1.095	0.300	1	0.179	0.179	24.471	0.000
	Bacteria	1	0.115	0.115	2.845	0.097	1	0.158	0.158	23.179	0.000
	Archaea	1	0.102	0.102	1.145	0.289	1	0.112	0.112	4.723	0.034
Temperature	Inverts eDNA	1	0.011	0.011	0.412	0.524	1	0.365	0.365	47.927	0.000
	Inverts morpho	1	0.017	0.017	1.101	0.299	1	0.008	0.008	0.430	0.515
	Meiofauna	1	0.001	0.001	0.027	0.870	1	0.168	0.168	8.883	0.004
	Algae	1	0.005	0.005	0.119	0.731	1	0.156	0.156	10.525	0.002
	Fungi	1	0.044	0.044	2.076	0.155	1	0.135	0.135	12.612	0.001
	Protozoa	1	0.004	0.004	0.178	0.675	1	0.160	0.160	20.780	0.000
	Bacteria	1	0.063	0.063	1.528	0.222	1	0.102	0.102	13.024	0.001
	Archaea	1	0.006	0.006	0.064	0.801	1	0.002	0.002	0.083	0.774
Precipitation	Inverts eDNA	1	0.011	0.011	0.412	0.524	1	0.365	0.365	47.927	0.000
	Inverts morpho	1	0.017	0.017	1.101	0.299	1	0.008	0.008	0.430	0.515
	Meiofauna	1	0.001	0.001	0.027	0.870	1	0.168	0.168	8.883	0.004
	Algae	1	0.005	0.005	0.119	0.731	1	0.156	0.156	10.525	0.002
	Fungi	1	0.044	0.044	2.076	0.155	1	0.135	0.135	12.612	0.001
	Protozoa	1	0.004	0.004	0.178	0.675	1	0.160	0.160	20.780	0.000
	Bacteria	1	0.063	0.063	1.528	0.222	1	0.102	0.102	13.024	0.001
	Archaea	1	0.006	0.006	0.064	0.801	1	0.002	0.002	0.083	0.774

Supplementary Table 6. Number of samples, reads and unique sequences (= molecular operational taxonomic units, MOTUs) for the Eukaryota (Euka02) and Bacteria/Archaea (Bact03) markers for the two first filtering steps, done per library (lib).

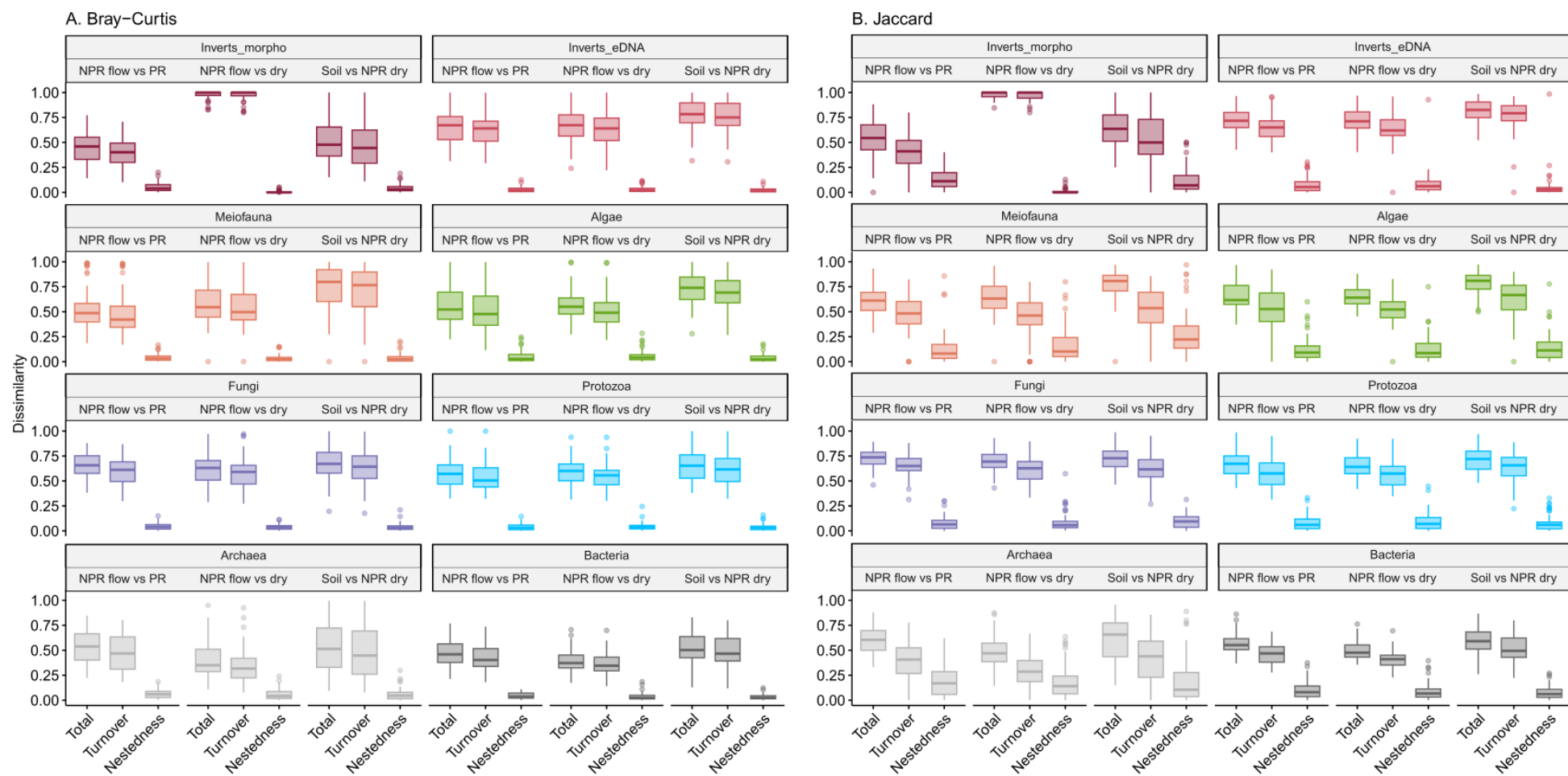
Filtering step	Euka02			Bact03		
	Samples	Reads	MOTUs	Samples	Reads	MOTUs
Raw data	lib1: 844	lib1: 39424061	lib1: 2291236	lib1: 844	lib1: 24044538	Lib1: 7566775
	lib2: 843	lib2: 33442844	lib2: 2003724	lib2: 843	lib2: 29020856	lib2: 8794511
	lib3: 843	lib3: 37273845	lib3: 2141990	lib3: 843	lib3: 22140708	lib3: 7048436
	lib4: 843	lib4: 40718361	lib4: 2266244	lib4: 843	lib4: 27694152	lib4: 8451228
	lib5: 842	lib5: 38226744	lib5: 2207096	lib5: 842	lib5: 27243992	lib5: 8205970
	lib6: 827	lib6: 39632396	lib6: 2232136	lib6: 827	lib6: 29238816	lib6: 8961379
	lib7: 827	lib7: 40329948	lib7: 2148366	lib7: 827	lib7: 25816082	lib7: 8104830
	lib8: 827	lib8: 37956061	lib8: 2137160	lib8: 827	lib8: 27597867	lib8: 8495001
Basic filter (singletons, length)	lib1: 844	lib1: 35907379	lib1: 597203	lib1: 844	lib1: 17666073	lib1: 1197405
	lib2: 843	lib2: 29789442	lib2: 514966	lib2: 843	lib2: 21625405	lib2: 1410795
	lib3: 843	lib3: 34100459	lib3: 561355	lib3: 843	lib3: 16198841	lib3: 1115810
	lib4: 843	lib4: 37204500	lib4: 596883	lib4: 843	lib4: 20582825	lib4: 1351217
	lib5: 842	lib5: 35161459	lib5: 574602	lib5: 842	lib5: 20346060	lib5: 1323823
	lib6: 827	lib6: 35261929	lib6: 581860	lib6: 827	lib6: 21661892	lib6: 1404980
	lib7: 827	lib7: 36185641	lib7: 567235	lib7: 827	lib7: 18944128	lib7: 1252046
	lib8: 827	lib8: 34254438	lib8: 564157	lib8: 827	lib8: 20412608	lib8: 1330128

Supplementary Table 7. Number of samples, PCR replicates, reads and unique sequences (= molecular operational taxonomic units, MOTUs) for the Eukaryota (Euka02) and Bacteria/Archaea (Bact03) marker for each of the filtering steps done after merging the libraries.

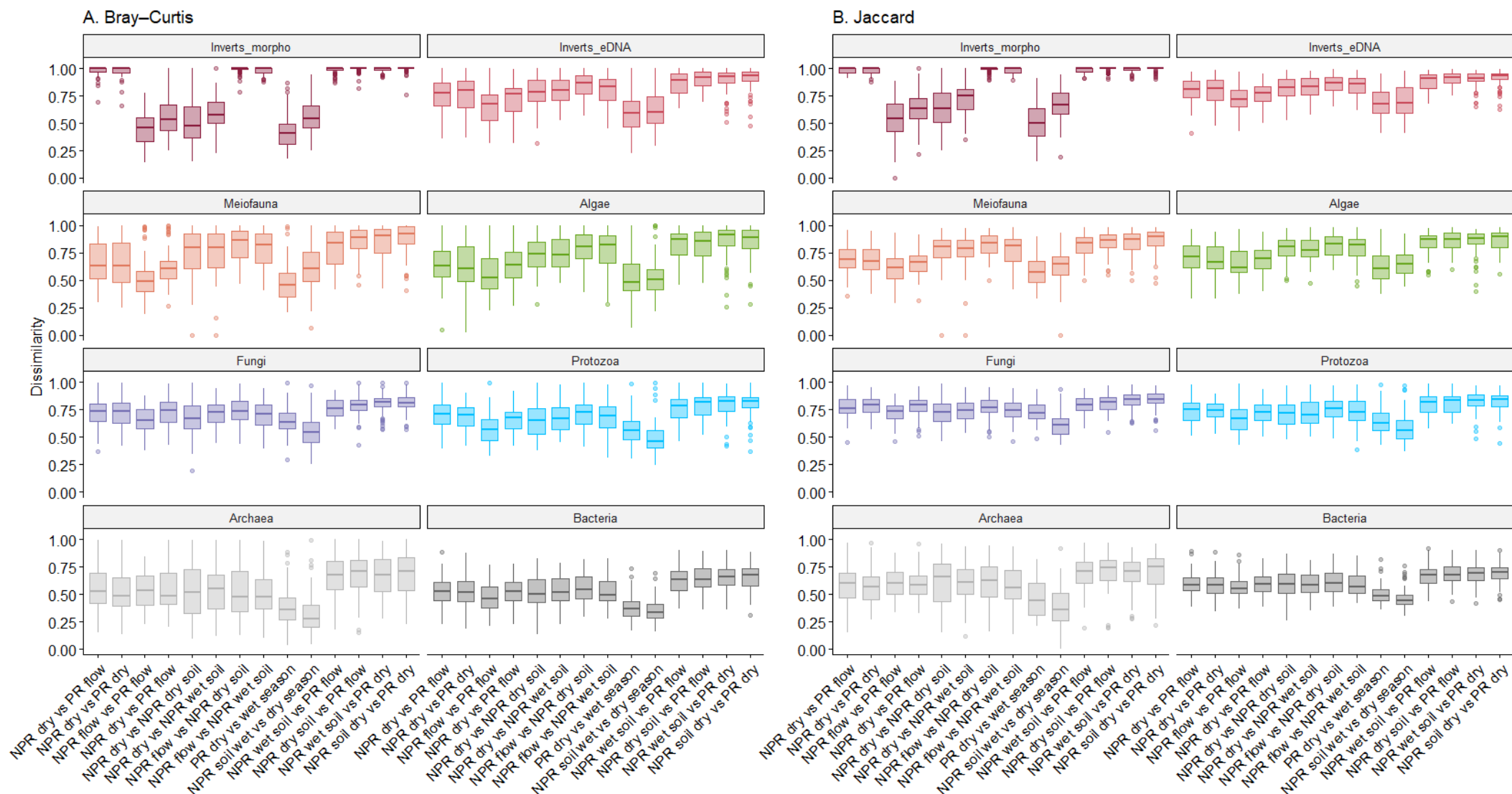
Filtering step	Euka02				Bact03			
	Samples	PCR replicates	Reads	MOTUs	Samples	PCR replicates	Reads	MOTUs
obiclean and keep only head sequences	2232	6696	217340451	61397	2232	6696	90461917	153155
Dataset cleaning: after removal of dysfunctional PCRs, contaminants and non-target taxa	2207	6459	162602293	57934	2228	6643	82029261	150902
Final curated dataset (after taxonomic assignment, MOTUs aggregation and samples pooling)	2115	6433	161676472	30036	2136	6616	81441270	44122



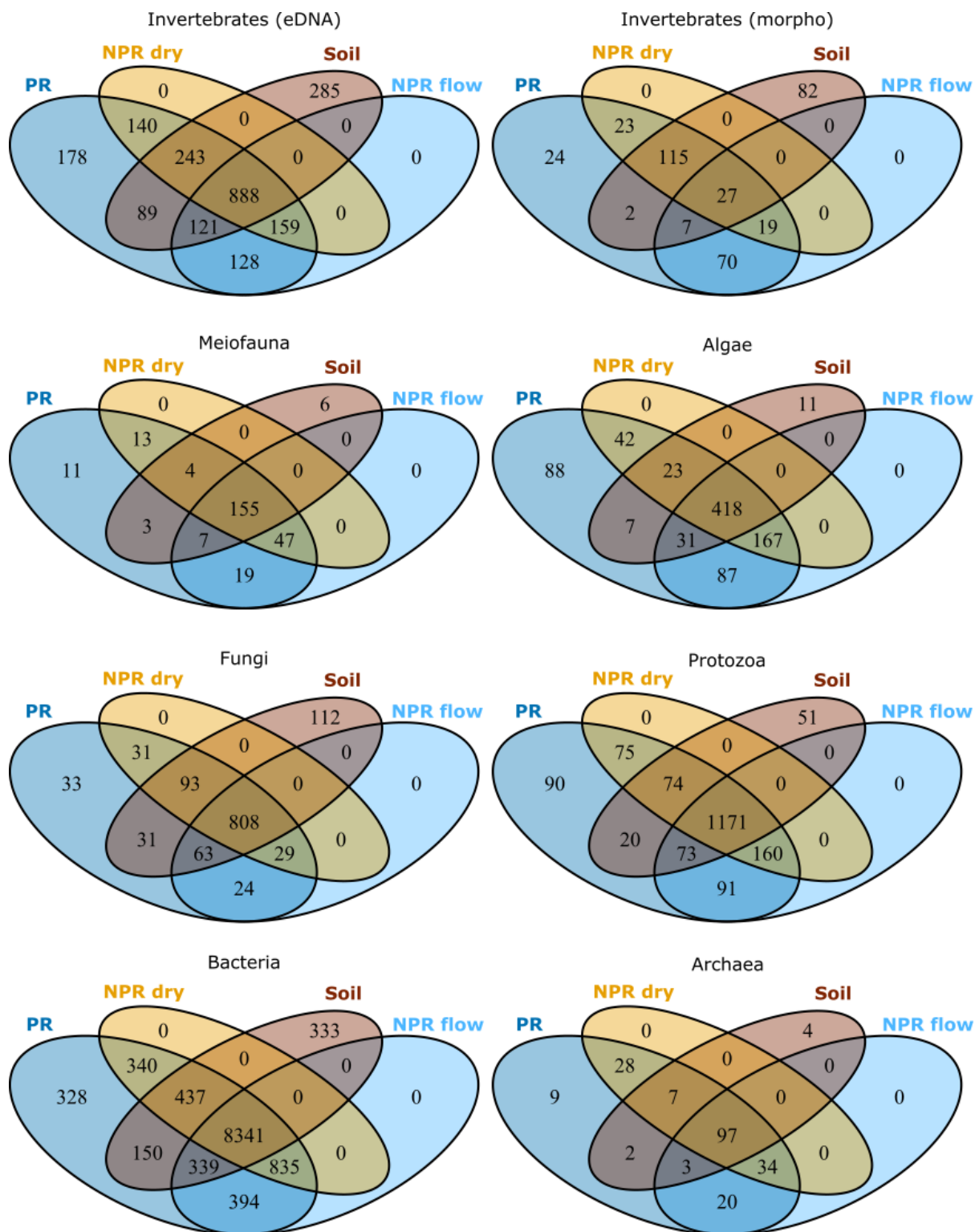
Supplementary Figure 1. Alpha diversity (A. richness and B. Shannon index) for each taxonomic group, habitat (riverbed, riparian zone), reach type (perennial [PR], non-perennial [NPR]) and sampling (dry [d], flowing[f]). Different letters indicate statistically significant differences. The Simpson index is not shown, as there were no significant differences for any group.



64 **Supplementary Figure 2.** Partitioning of Bray-Curtis (A) and Jaccard (B) dissimilarity into turnover and nestedness for the comparisons: NPR flow vs PR, NPR flow vs NPR
65 dry and Soil vs NPR dry.



67 **Supplementary Figure 3.** Beta diversity based on A. Bray-Curtis and B. Jaccard dissimilarity of the comparisons used to calculate the relative position and deviation in the
68 continuum. Wet soil = soil of the flowing campaign; Dry soil = soil of the dry sampling; Wet vs dry season = sample of flowing vs dry sampling.



Supplementary Figure 4. Venn diagrams showing taxa shared among or exclusive to perennial and non-perennial reaches, flowing and dry conditions, and riverbed and riparian habitats. PR = perennial riverbed (both hydrological phases, aquatic reference state), Soil = NPR riparian soil (both phases, terrestrial reference state), NPR flow = NPR riverbed in flowing conditions and NPR dry = NPR riverbed in dry conditions. Numbers indicate the number of families (for morphologically-based invertebrates) and the number of MOTUs (for all other groups).