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River runoff in Switzerland in a changing climate – runoff regime changes and their time of emergence

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Table S1: Overview of the main characteristics of the 93 catchments

ID	station	river	area (km2)	mean altitude (masl)	min altitude (masl)	max altitude (masl)	glaciation (%)
2020	Bellinzona	Ticino	1517.5	1679	220	3345	0
2033	Ilanz	Vorderrhein	774	2026	685	3557	1.8
2034	Payerne	Broye	415.9	724	368	1574	0
2044	Andelfingen	Thur	1701.6	773	354	2431	0
2056	Seedorf	Reuss	833.2	2005	432	3598	6.4
2070	Emmenmatt	Emme	443	1072	562	2161	0
2078	Le Prese	Poschiavino	167.7	2161	962	3875	3.9
2084	Ingenbohl	Muota	316.6	1364	425	2731	0
2087	Andermatt	Reuss	190.2	2276	1125	3598	2.9
2104	Weesen	Linth	1061.5	1580	416	3557	1.6
2106	Muenchenstein	Birs	887.3	733	256	1424	0
2112	Appenzell	Sitter	74.4	1254	445	2431	0
2122	Moutier	Birse	185.8	927	493	1424	0
2126	Waengi	Murg	80.1	654	456	1113	0
2132	Neftenbach	Toess	343.3	659	380	1298	0
2141	Tiefencastel	Albula	529	2127	837	3317	0.5
2151	Oberwil	Simme	343.7	1639	778	3208	2.4
2155	Wiler	Emme	924.1	871	430	2161	0
2159	Belp	Guerbe	116.1	849	508	2128	0
2160	Broc	Sarine	636.3	1501	674	3207	0
2167	Ponte Tresa	Tresa	609.1	805	198	2207	0
2176	Zuerich	Sihl	342.6	1047	402	2223	0
2179	Thoerishaus	Sense	351.2	1076	524	2182	0
2181	Halden	Thur	1085	914	445	2431	0
2185	Chur	Plessur	264.4	1865	545	2923	0
2202	Liestal	Ergolz	261.2	591	296	1181	0
2203	Aigle	Grande Eau	131.6	1566	384	3167	0.8
2210	Ocourt	Doubs	1275.4	960	407	1448	0
2219	Oberried	Simme	34.7	2335	1075	3208	22.6
2232	Adelboden	Allenbach	28.8	1855	1093	2833	0
2256	Pontresina	Rosegbach	66.5	2701	1720	3981	21.7
2262	Pontresina	Berninabach	106.9	2608	1783	3981	14.4
2270	Combe des Sarrasins	Doubs	998.5	985	553	1448	0
2276	Isenthal	Grosstalbach	43.9	1810	767	2961	6.7
2299	Erstfeld	Alpbach	20.7	2181	629	3129	19.7
2300	Euthal	Minster	59.1	1352	642	2223	0
2303	Jonschwil	Thur	492.9	1027	535	2431	0
2304	Zernez	Ova dal Fuorn	55.3	2333	1666	3114	0
2305	Herisau	Glatt	16.7	836	624	1145	0

2307	Sonceboz	Suze	127.2	1044	634	1595	0
2308	Goldach	Goldach	50.4	840	391	1245	0
2312	Salmsach	Aach	47.4	476	391	609	0
2319	Zernez	Ova da Cluozza	26.9	2361	1468	3115	0
2321	Pregassona	Cassarate	75.8	991	272	2198	0
2342	Brig	Saltina	76.5	2017	661	3407	2.5
2343	Huttwil	Langeten	59.9	765	566	1123	0
2355	Davos	Landwasser	183.7	2223	1453	3180	0
2356	Cavergno	Riale di Calneggia	23.9	1982	645	2866	0
2366	La Roesa	Poschiavino	14.1	2286	1707	3012	0
2368	Locarno	Maggia	926.9	1534	191	3208	0
2369	Yvonand	Mentue	105.3	683	436	946	0
2370	Le Noirmont	Doubs	1046.7	985	503	1448	0
2372	Mollis	Linth	600.2	1737	427	3557	2.9
2374	Mogelsberg	Necker	88.1	962	604	1513	0
2386	Frauenfeld	Murg	213.3	596	381	1113	0
2409	Eggiwil	Emme	124.4	1283	562	2161	0
2412	Vuippens	Sionge	43.4	872	674	1457	0
2415	Rheinsfelden	Glatt	417.4	506	340	1105	0
2419	Reckingen	Rhone	214.3	2301	1307	3598	11.8
2420	Lumino	Moesa	471.9	1668	229	3169	0
2426	Mels	Seez	106.1	1796	469	3073	0
2432	Ecublens	Venoge	227.6	694	372	1662	0
2434	Olten	Duennern	233.8	714	390	1383	0
2450	Zofingen	Wigger	366.2	662	419	1393	0
2461	Magliaso	Magliasina	34.4	927	269	1904	0
2468	St. Gallen	Sitter	261.1	1045	445	2431	0
2469	Hondrich	Kander	490.7	1846	558	3675	5.1
2471	Murgenthal	Murg	183.4	659	410	1123	0
2474	Buseno	Calancasca	120.5	1930	503	3169	0.2
2477	Zug	Lorze	100.2	822	411	1556	0
2478	Soyhieres	Birse	569.5	811	380	1424	0
2479	Delemont	Sorne	213.9	785	408	1326	0
2480	Boudry	Areuse	377.7	1084	427	1573	0
2481	Buochs	Engelberger Aa	228	1605	432	3137	2.5
2486	Vevey	Veveyse	64.5	1108	372	1959	0
2487	Werthenstein	Kleine Emme	311.5	1171	525	2290	0
2491	Buerglen	Schaechen	107.9	1722	436	3221	1.5
2493	Gland	Promenthouse	119.8	1035	372	1667	0
2494	Pollegio	Ticino	443.8	1794	277	3120	0
2497	Nebikon	Luthern	104.7	754	474	1393	0
2498	Castrisch	Glenner	380.9	2014	685	3345	1.1
2500	Ittigen	Worble	67.1	678	494	954	0
2603	Langnau	Ilfis	187.4	1047	681	2045	0
2604	Biberbrugg	Biber	31.9	1008	602	1515	0
2605	Lavertezzo	Verzasca	185.1	1663	463	2837	0
2607	Oberwald	Goneri	38.4	2378	1353	3120	4

2609	Einsiedeln	Alp	46.7	1161	660	1783	0
2610	Vicques	Scheulte	72.7	797	419	1292	0
2612	Lavertezzo	Riale di Pincascia	44.5	1713	463	2520	0
2617	Muestair	Rom	128.5	2188	1167	3196	0
2629	Agno	Vedeggio	99.9	921	198	2198	0
2630	Sion	Sionne	27.6	1575	485	3084	0
2634	Emmen	Kleine Emme	478.3	1058	425	2290	0

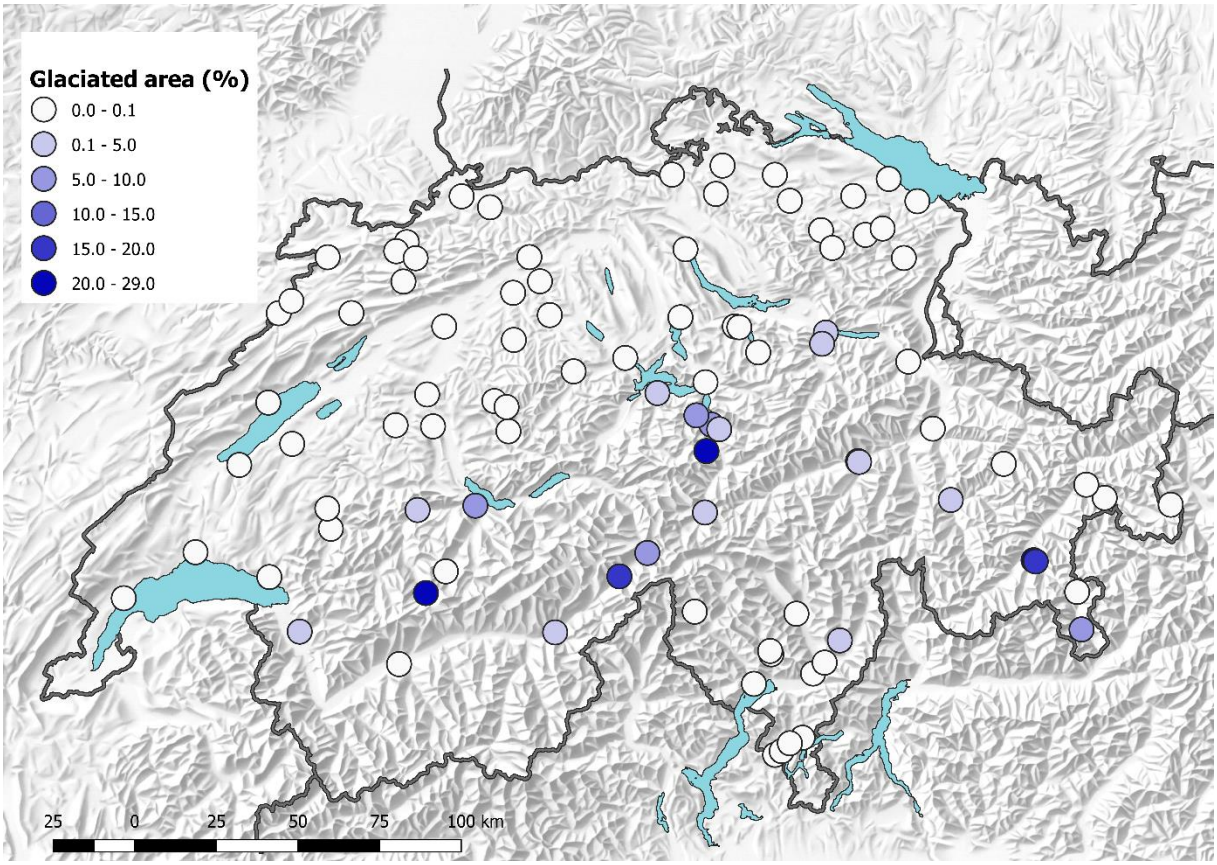

Figure S1: Degree of modelled glaciated area in the reference period.

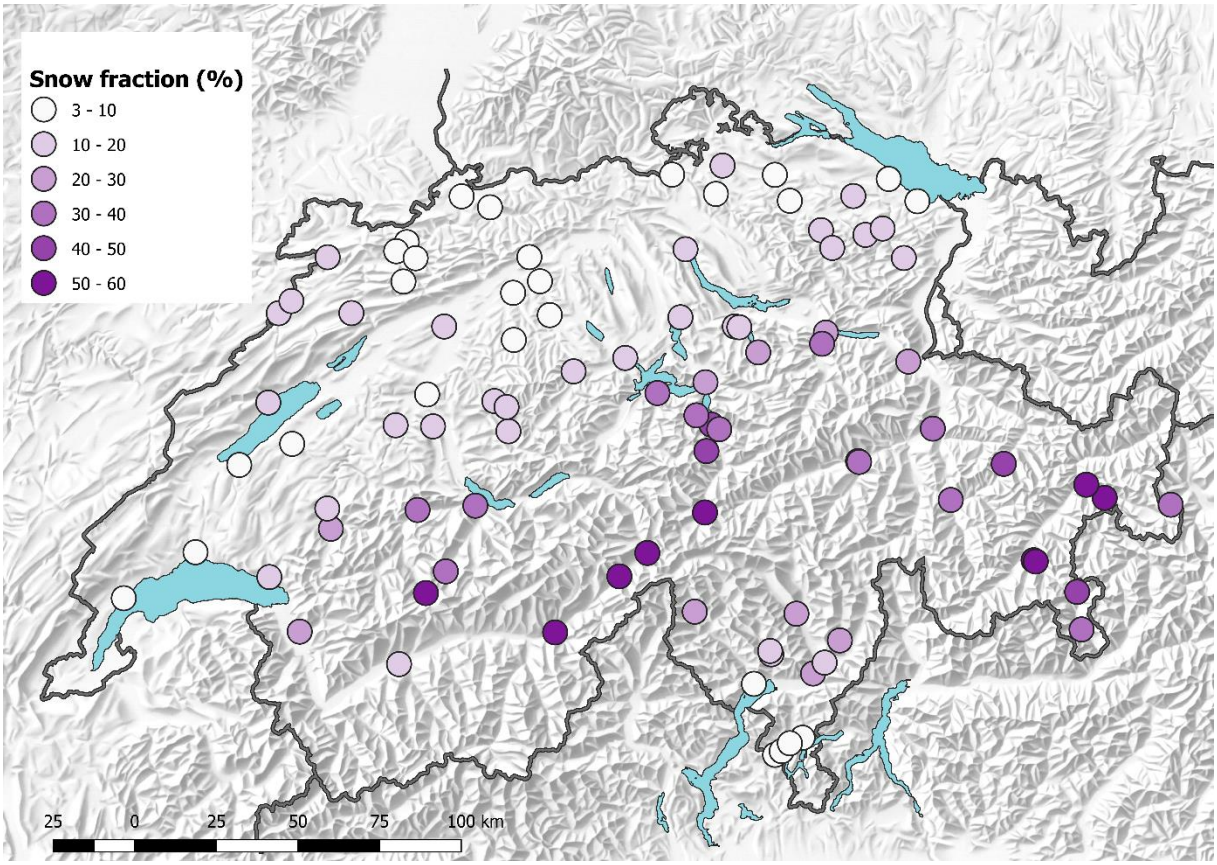

Figure S2: Median of modelled fraction of annual precipitation falling as snow in the reference period.

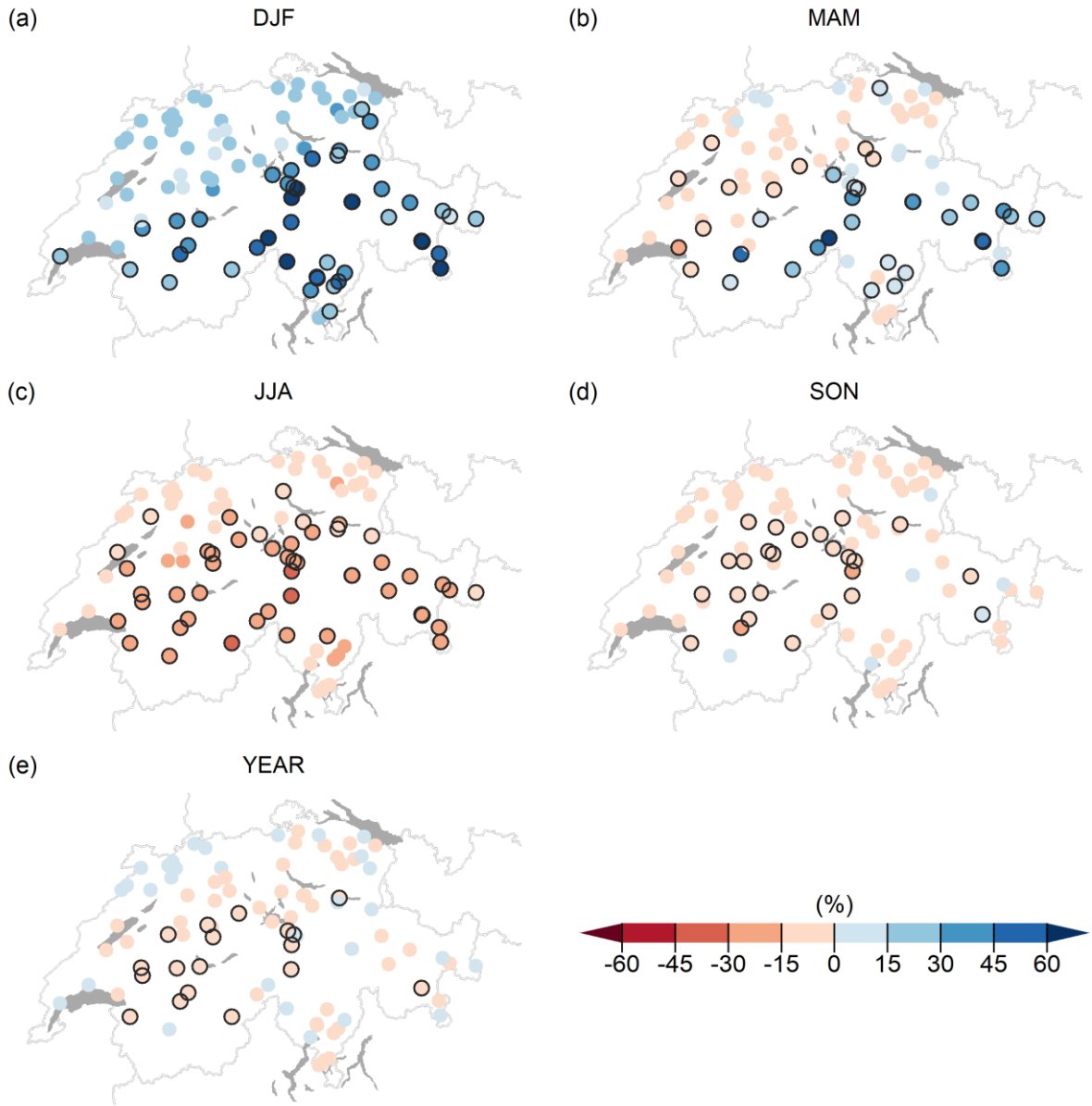

Figure S3: Multimodel median of seasonal and annual mean changes of runoff under RCP4.5 by 2070–2099 for winter (a), spring (b), summer (c), autumn (d), and annual means (e). Black circles indicate catchments whose direction of change agrees across at least 90%the models.

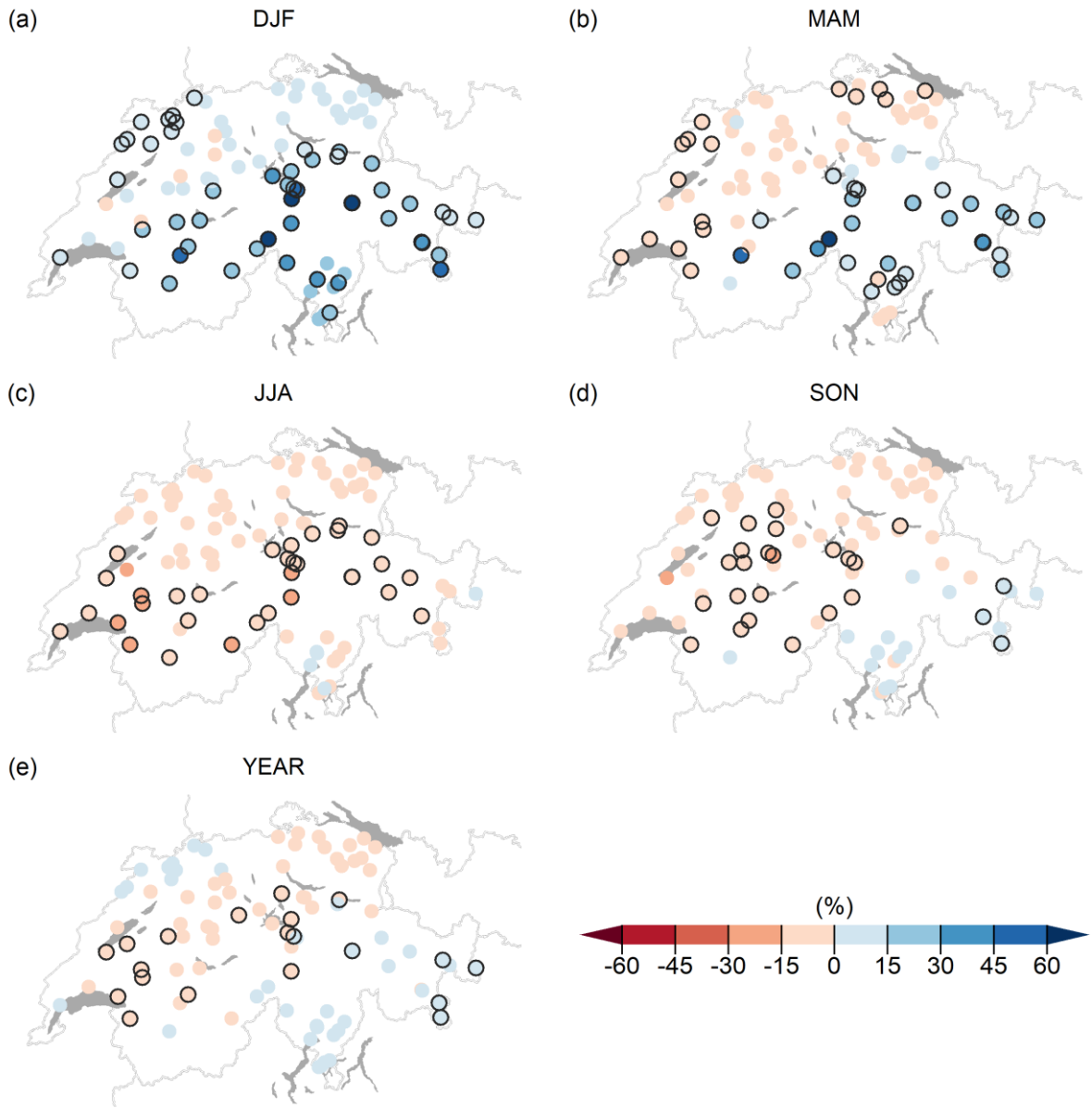

Figure S4: Multimodel median of seasonal and annual mean changes of runoff under RCP2.6 by 2045–2074 for winter (a), spring (b), summer (c), autumn (d), and annual means (e). Black circles indicate catchments whose direction of change agrees across at least 90%the models.

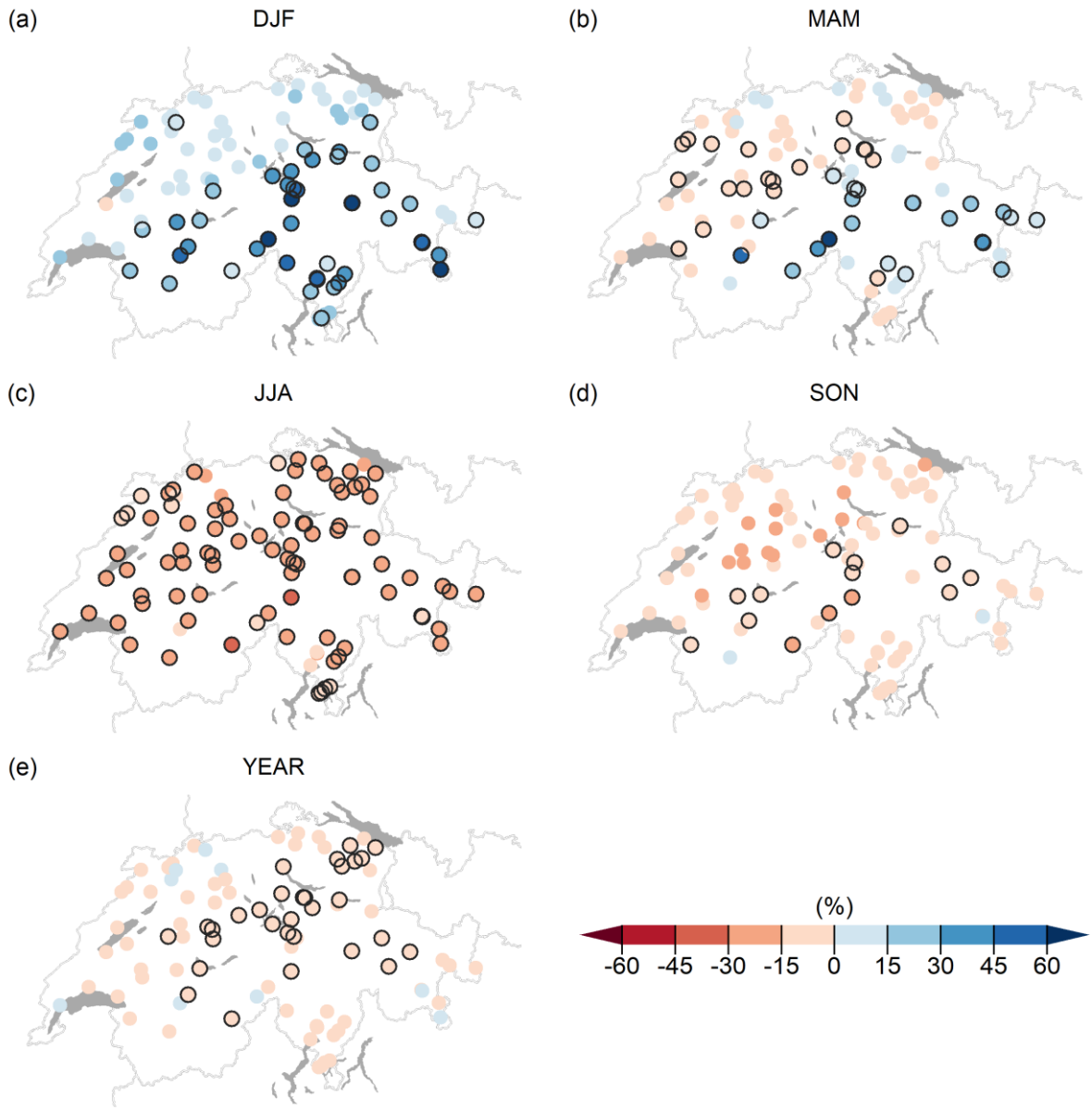

Figure S5: Multimodel median of seasonal and annual mean changes of runoff under RCP4.5 by 2045–2074 for winter (a), spring (b), summer (c), autumn (d), and annual means (e). Black circles indicate catchments whose direction of change agrees across at least 90%the models.

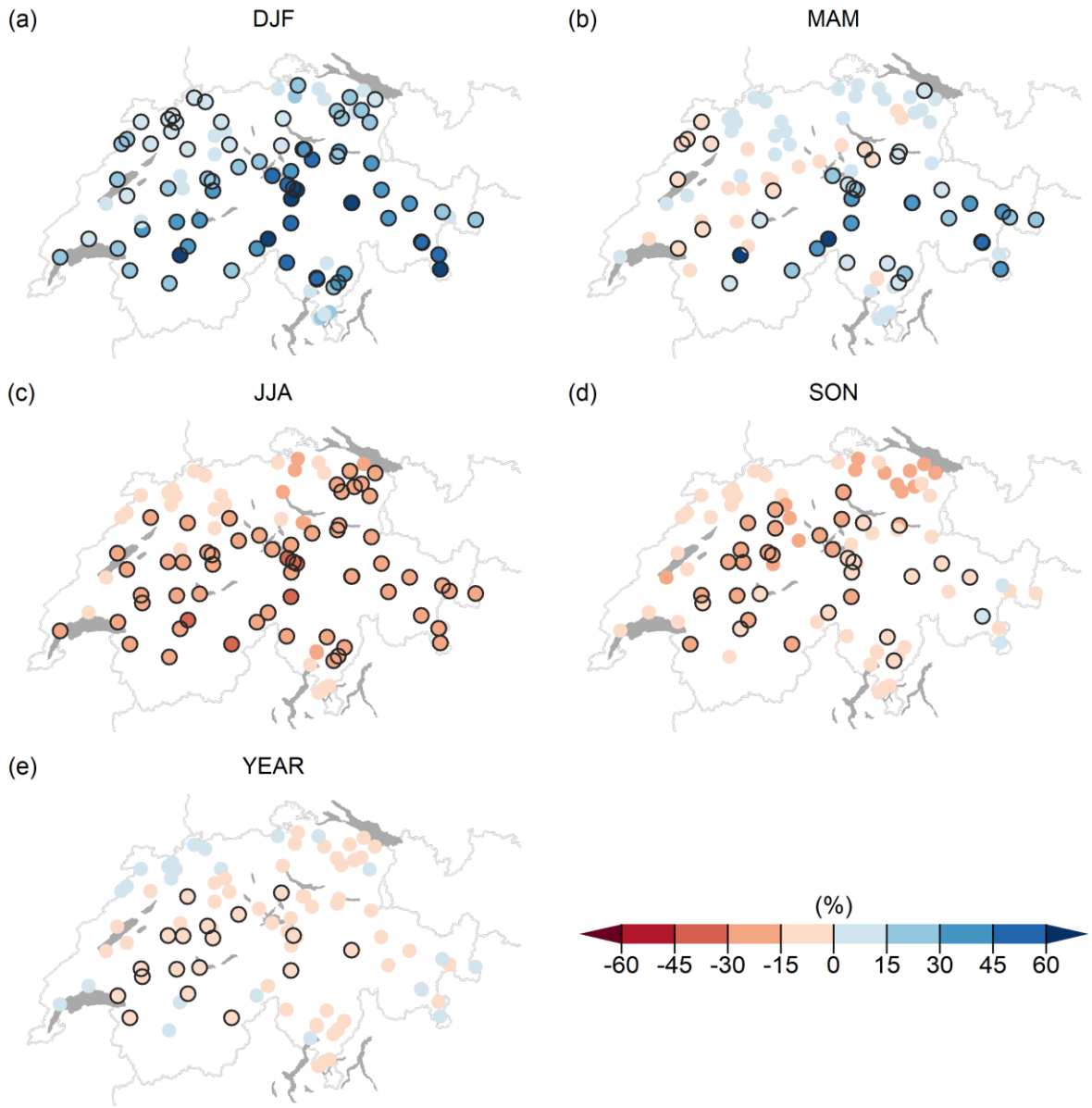

Figure S6: Multimodel median of seasonal and annual mean changes of runoff under RCP8.5 by 2045–2074 for winter (a), spring (b), summer (c), autumn (d), and annual means (e). Black circles indicate catchments whose direction of change agrees across at least 90%the models.

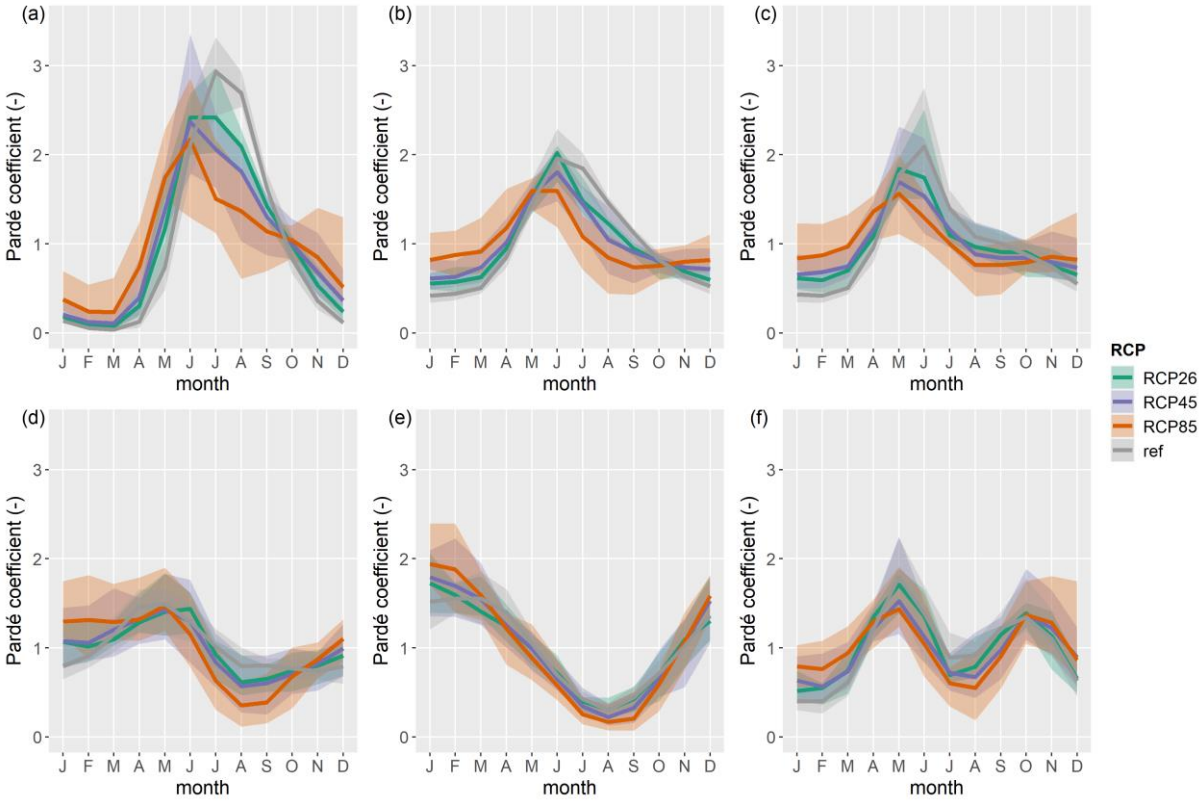

Figure S7: Pardé coefficients for the six representative catchments Rosegbach (a), Kander (b), Plessur (c), Emme (d), Venoge (e), and Verzasca (f). Thick lines represent the multi-model median for the reference period (grey), for 2070–2099under RCP2.6 (turquoise), for 2070–2099under RCP4.5 (blue), and for 2070–2099under RCP8.5 (orange). Shadings show the full model range for each RCP.

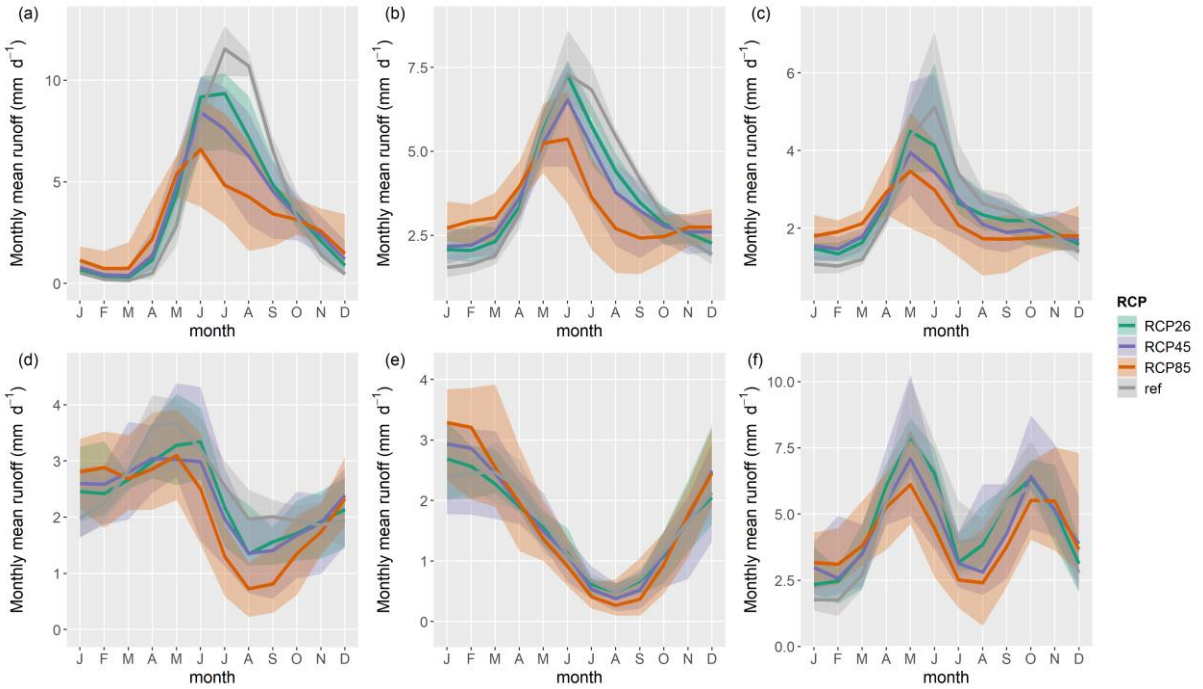

Figure S8: Runoff regimes for the six representative catchments Rosegbach (a), Kander (b), Plessur (c), Emme (d), Venoge (e), and Verzasca (f). Thick lines represent the multi-model median for the reference period (grey), for 2070–2099under RCP2.6 (turquoise), for 2070–2099under RCP4.5 (blue), and for 2070–2099under RCP8.5 (orange). Shadings show the full model range for each RCP.

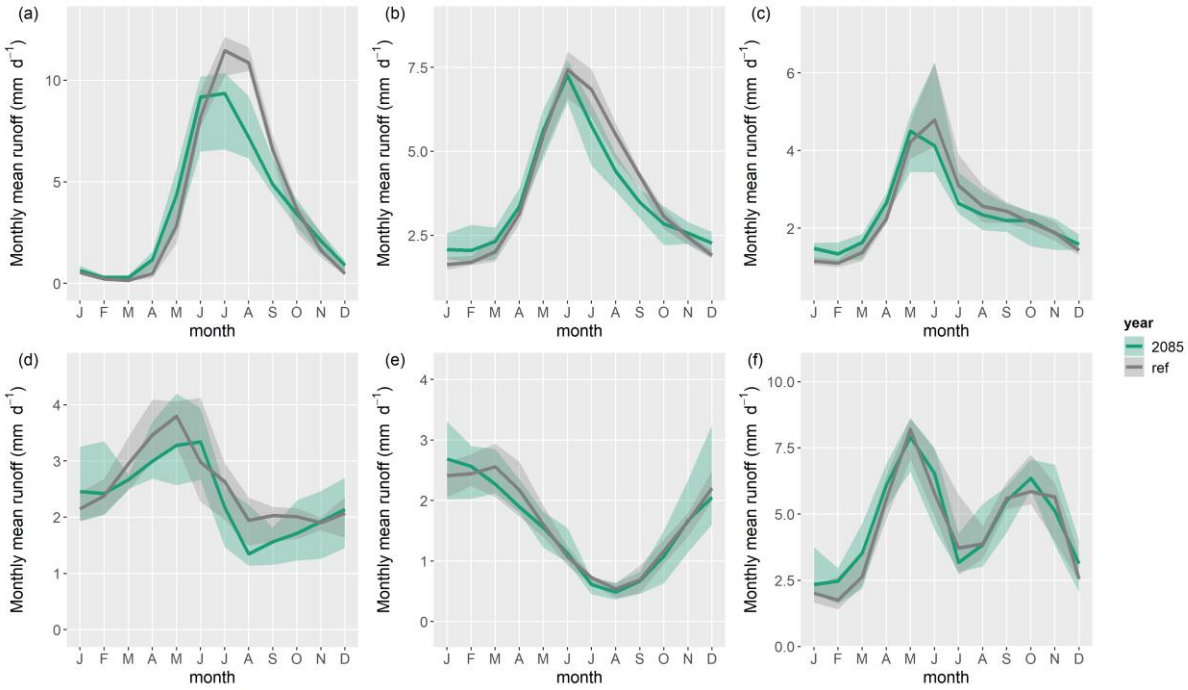

Figure S9: Runoff regimes for the six representative catchments Rosegbach (a), Kander (b), Plessur (c), Emme (d), Venoge (e), and Verzasca (f). Thick lines represent the multi-model median for the reference period (grey) and for 2070–2099under RCP2.6. Shadings show the full model range for each RCP.

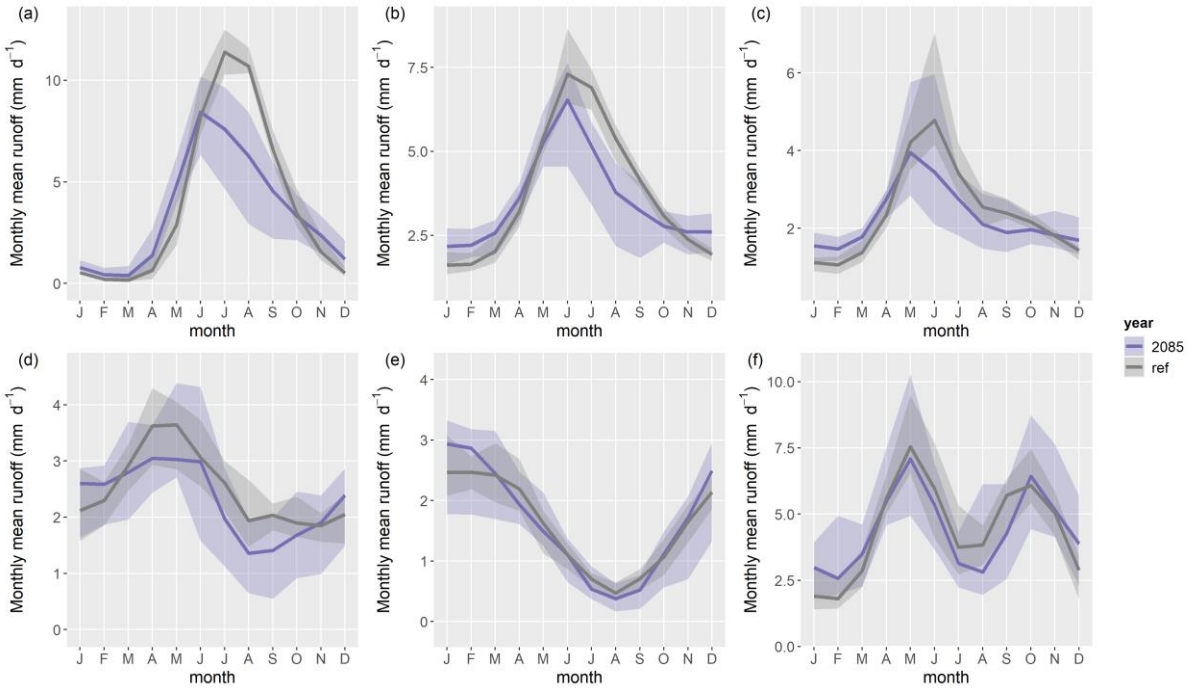

Figure S10: Runoff regimes for the six representative catchments Rosegbach (a), Kander (b), Plessur (c), Emme (d), Venoge (e), and Verzasca (f). Thick lines represent the multi-model median for the reference period (grey) and for 2070–2099 under RCP4.5. Shadings show the full model range for each RCP.

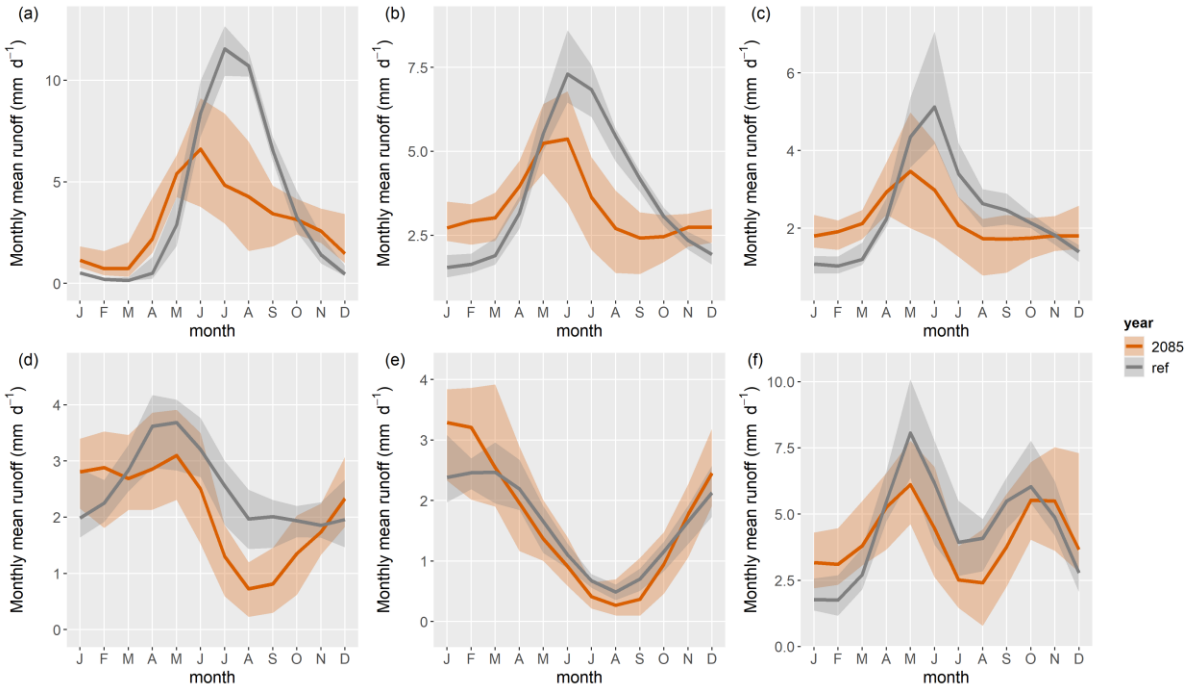

Figure S11: Runoff regimes for the six representative catchments Rosegbach (a), Kander (b), Plessur (c), Emme (d), Venoge (e), and Verzasca (f). Thick lines represent the multi-model median for the reference period (grey) and for 2070–2099 under RCP8.5. Shadings show the full model range for each RCP.