

Table S1. Mean relative absolute error (MRAE) for LM1_Q (LM1) and LM2_QS (LM2), and the significance (P) of the difference between LM1 and LM2 for each target month and each year. Bold numbers indicate the MRAEs are not significantly different between LM1_Q and LM2_QS at the 95% significance level.

	Nov			Dec			Jan			Feb			Mar			JFM		
	LM1	LM2	P	LM1	LM2	P	LM1	LM2	P	LM1	LM2	P	LM1	LM2	P	LM1	LM2	P
2002	32.78	23.66	0	25.71	15.02	0												
2003	14.66	10.11	0	23.67	15.60	0	40.24	4.60	0	21.25	19.25	0.0815	31.70	6.83	0	30.63	5.17	0
2004	3.13	4.68	0	6.42	3.72	0	31.08	4.50	0	45.28	15.01	0	26.80	5.46	0	33.30	7.79	0
2005	17.36	16.48	0.3306	29.96	28.22	0.2596	12.19	1.77	0	16.72	5.52	0	16.79	8.16	0	15.34	5.37	0
2006	9.34	7.75	0	11.11	8.49	0	19.35	14.26	0	22.47	17.27	0	28.08	22.90	0.0002	23.36	18.20	0
2007	6.26	6.84	0.003	2.87	2.07	0.0001	16.16	5.88	0	17.89	7.06	0	2.12	5.50	0	10.05	1.35	0
2008	6.63	7.97	0.0005	3.91	6.10	0	2.63	7.27	0	18.81	12.83	0	1.44	3.89	0	4.10	1.17	0
2009	16.57	17.15	0.1689	23.20	24.14	0.1078	7.42	3.36	0	7.06	15.19	0	7.52	14.27	0	4.20	11.18	0
2010	14.76	11.35	0	4.46	2.87	0	8.99	12.95	0	12.00	15.95	0	7.58	10.27	0	9.26	12.92	0
2011	15.52	14.37	0.0002	21.28	19.58	0	15.09	3.07	0	5.85	8.56	0	2.45	9.84	0	6.99	5.51	0.0004
2012	3.95	2.28	0	4.16	4.82	0.0328	16.99	12.79	0	17.86	13.60	0	18.37	14.90	0	17.79	13.85	0
2013	2.02	6.03	0	6.12	14.17	0	26.00	7.21	0	32.80	15.28	0	28.45	13.77	0	29.11	12.33	0
2014	11.06	16.79	0	6.47	2.63	0	2.62	19.06	0	4.31	16.26	0	3.11	12.87	0	3.18	15.67	0
2015	10.96	10.53	0.1429	1.55	1.42	0.4248	13.94	5.79	0	9.19	12.15	0	4.86	13.77	0	9.00	10.67	0
2016	4.24	1.86	0	3.19	9.87	0	16.17	11.44	0	12.26	7.48	0	10.82	7.39	0	12.79	8.59	0

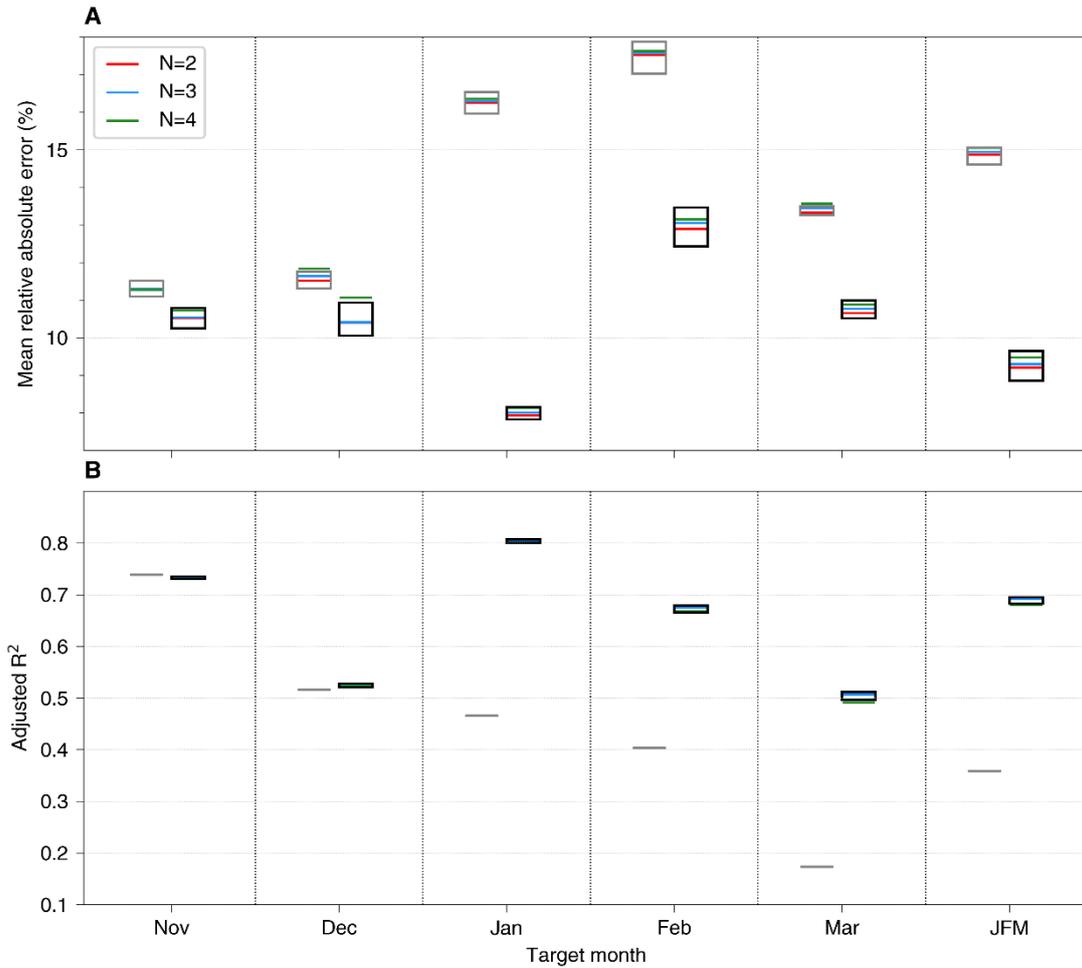


Figure S1. Performance of the linear models with different forecast periods. (A) Mean relative absolute errors (MRAEs) of modeled streamflow compared to observations. (B) Adjusted R² of the simulations. The bars show the ensemble medians, wherein the red, blue, and green bars are for forecast periods of 2, 3, and 4 years, respectively. The gray and black rectangles show the ranges between the 25th and 75th percentiles for LM1_Q and LM2_QS, respectively. Ranges are not shown for the forecast periods of 3 and 4 years.

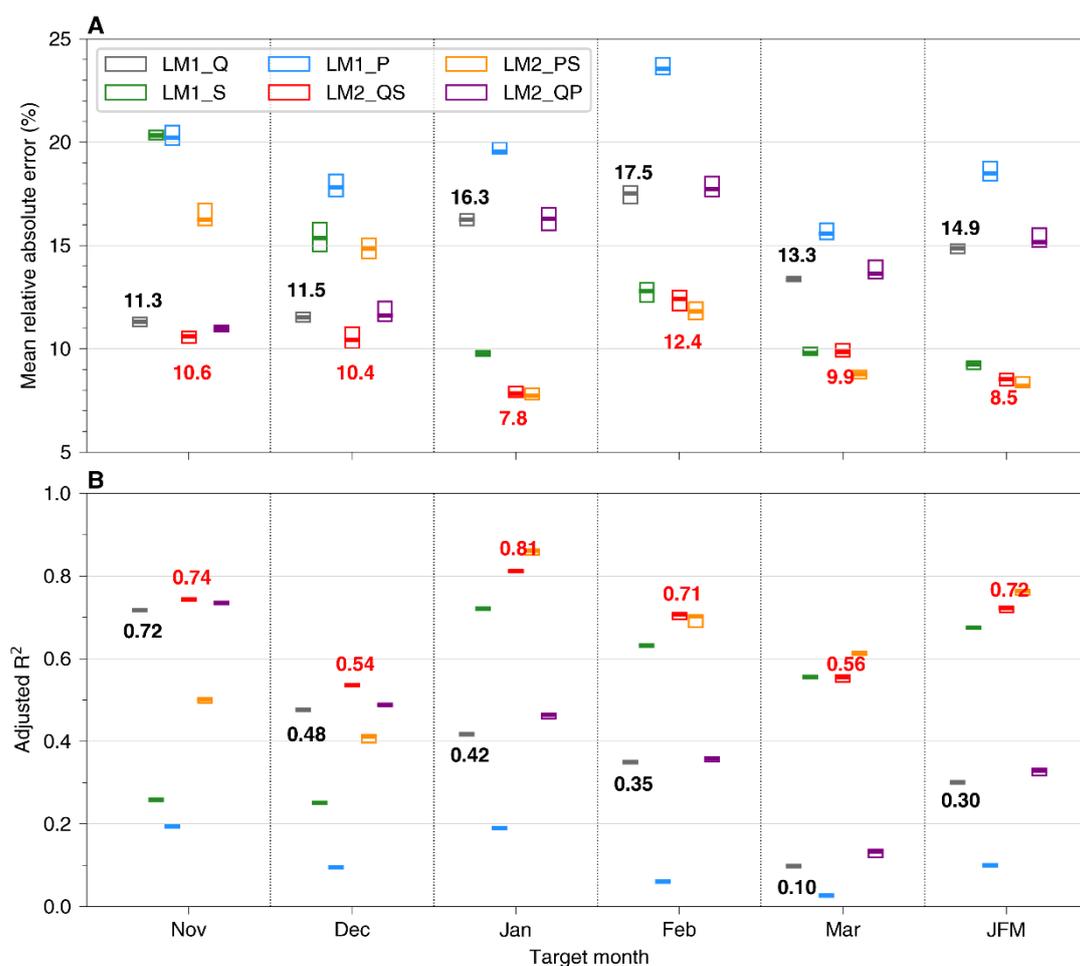


Figure S2. Performance of the linear models with the JPL TWSA at the Tangnaihahi stations. (A) Mean relative absolute errors (MRAEs) of modeled streamflow compared to observations. (B) Adjusted R^2 of the simulations. The thick bars show the ensemble medians, while the rectangles show the ranges between the 25th and 75th percentiles. The MRAEs are averaged over all years for each target month. In the legend, Q, S, and P denote streamflow, TWSA, and precipitation, respectively, as the predictors used in the linear models. The TWSA of the JPL solution is used. Median MRAEs and median adjusted R^2 of LM1_Q are shown in black and those of LM2_QS are in red.

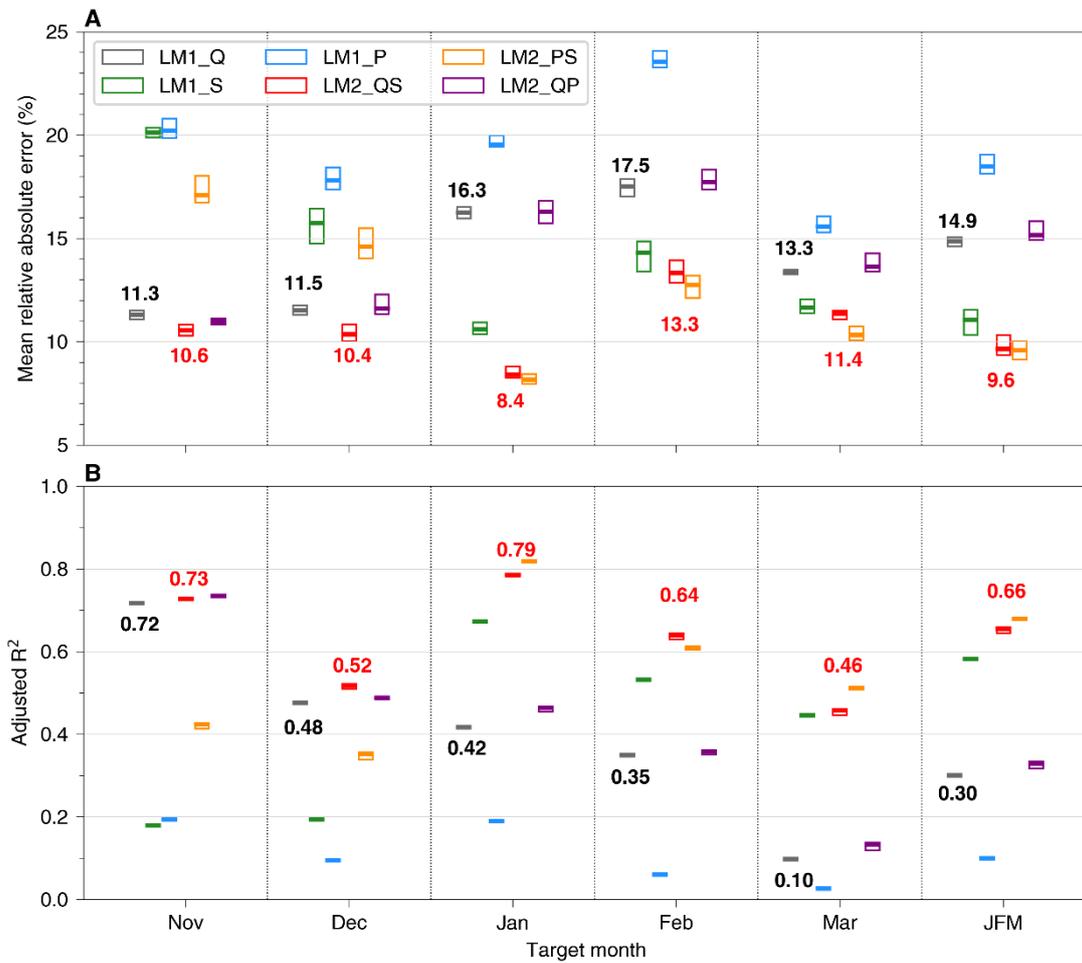


Figure S3. Performance of the linear models with the CSR TWSA at the Tangnaihahi stations. (A) Mean relative absolute errors (MRAEs) of modeled streamflow compared to observations. (B) Adjusted R^2 of the simulations. The thick bars show the ensemble medians, while the rectangles show the ranges between the 25th and 75th percentiles. The MRAEs are averaged over all years for each target month. In the legend, Q, S, and P denote streamflow, TWSA, and precipitation, respectively, as the predictors used in the linear models. The TWSA of the CSR solution is used. Median MRAEs and median adjusted R^2 of LM1_Q are shown in black and those of LM2_QS are in red.

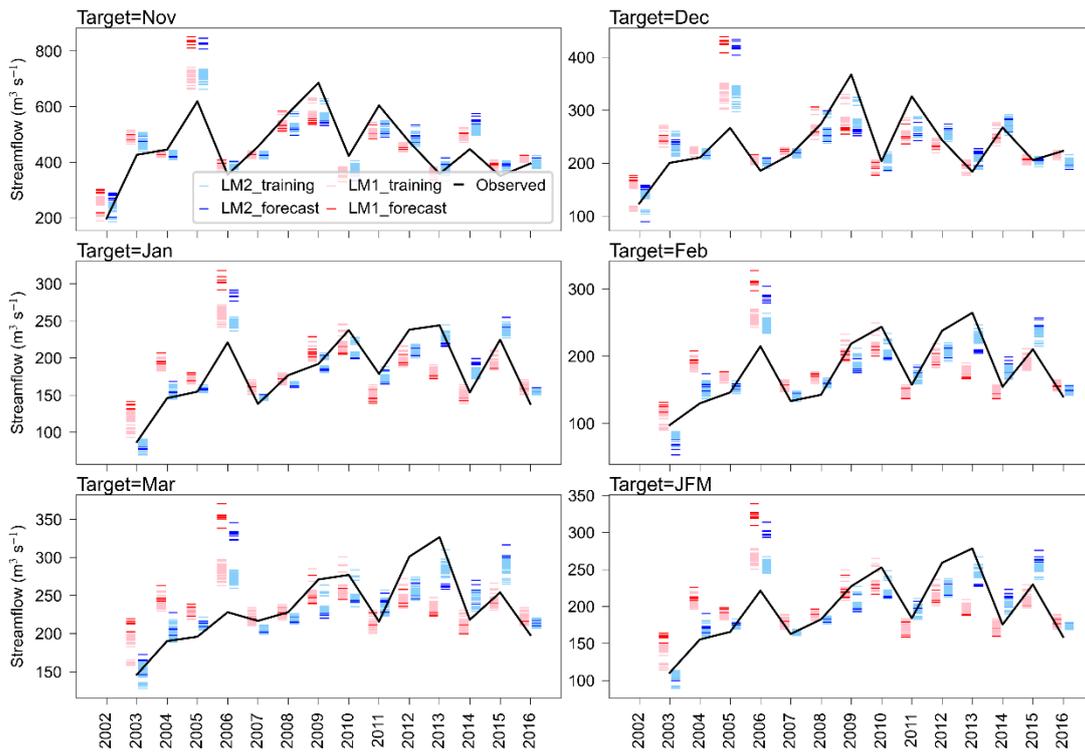


Figure S4. Observed monthly streamflow and modeled results with resampled data for each target month in each year.