Supplement of Hydrol. Earth Syst. Sci., 25, 5065–5081, 2021
https://doi.org/10.5194/hess-25-5065-2021-supplement

Hydrology and Earth System Sciences
Open Access
EGU

Supplement of

Spatially distributed impacts of climate change and groundwater demand on the water resources in a wadi system

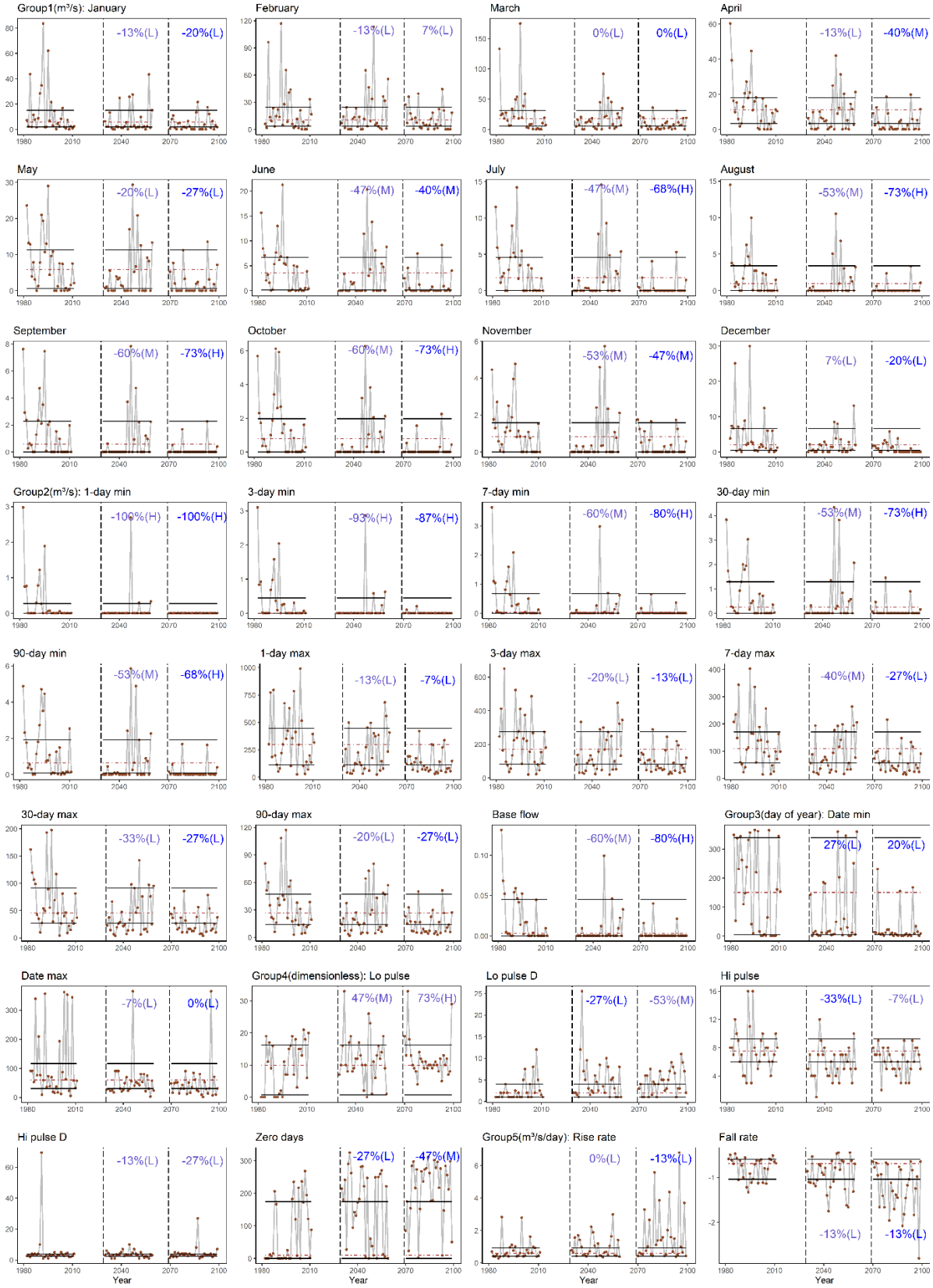
Nariman Mahmoodi et al.

Correspondence to: Nariman Mahmoodi (nmahmoodi@hydrology.uni-kiel.de)

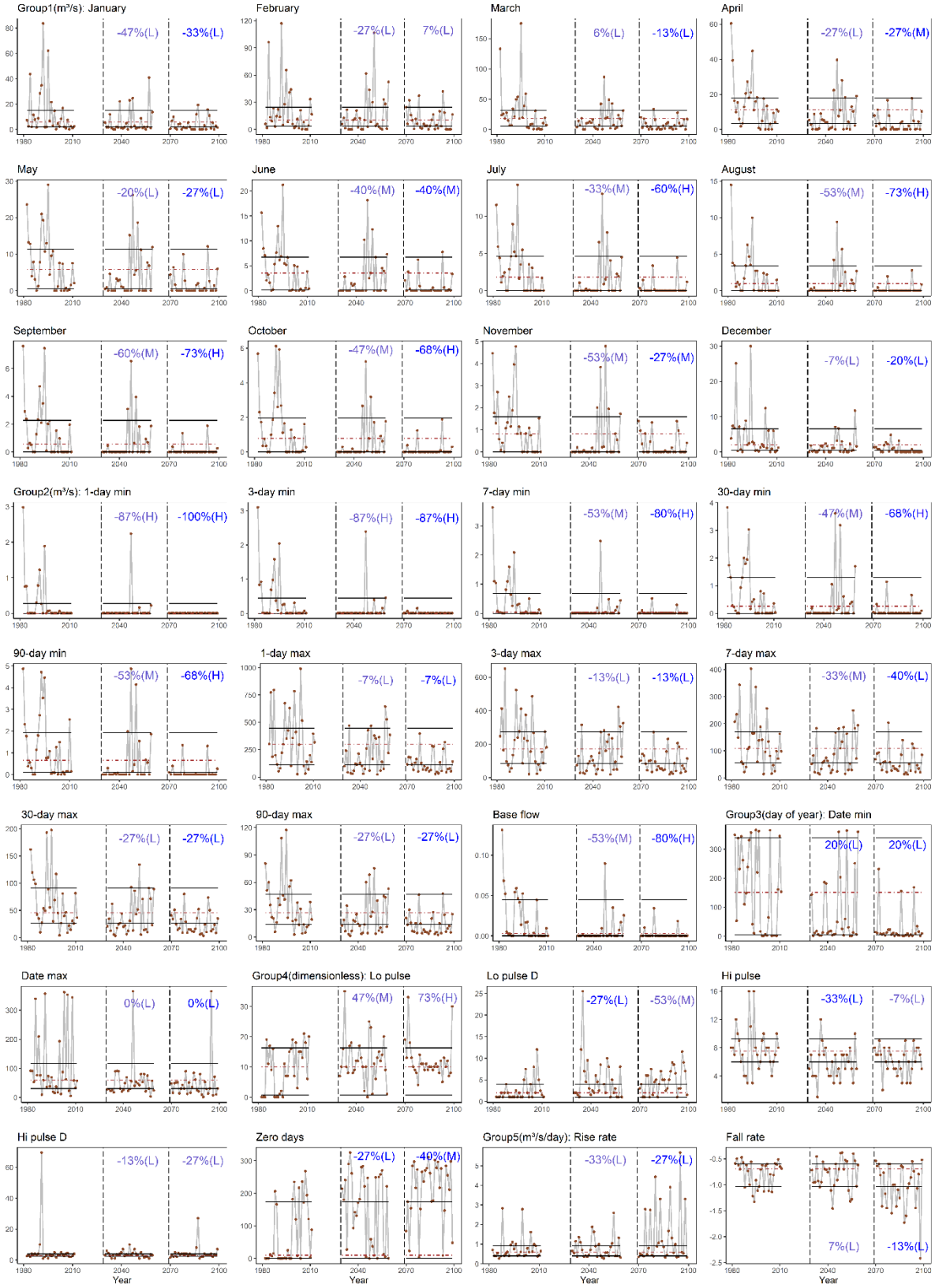
Table S1: Non-parametric IHA scorecard for the model setup and the future periods under the three WUS-scenarios.

	Baseline period (1982-2011)	**Future period 1 (2030-2059)**			**Future period 2 (2070-2099)**		
		No-WUS	Constant-WUS	Projected-WUs	No-WUS	Constant-WUS	Projected-WUs
Normalization Factor	1	1	1	1	1	1	1
Mean annual flow ($m^3 s^{-1}$)	12.13	10.66	9.94	9.23	6.13	5.84	5.5
Non-Normalized Mean Flow ($m^3 s^{-1}$)	12.13	10.66	9.94	9.23	6.13	5.84	5.5
Annual Coefficient of Variation (C. V).	2.99	4.39	4.5	4.63	4.76	4.9	5.06
Flow predictability	0.28	0.32	0.34	0.34	0.43	0.44	0.44
Constancy/predictability	0.54	0.60	0.62	0.62	0.71	0.70	0.70
Percent of floods in 60d period	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Duration of flood-free season (day)	10	48	48	48	124	124	124
Low Pulse Threshold ($m^3 s^{-1}$)	0.28	-	-	-	-	-	-
High Pulse Threshold ($m^3 s^{-1}$)	9.71	-	-	-	-	-	-

i)NO-WUS Scenario



ii)Constant-WUS Scenario



iii)Projected-WUS Scenario

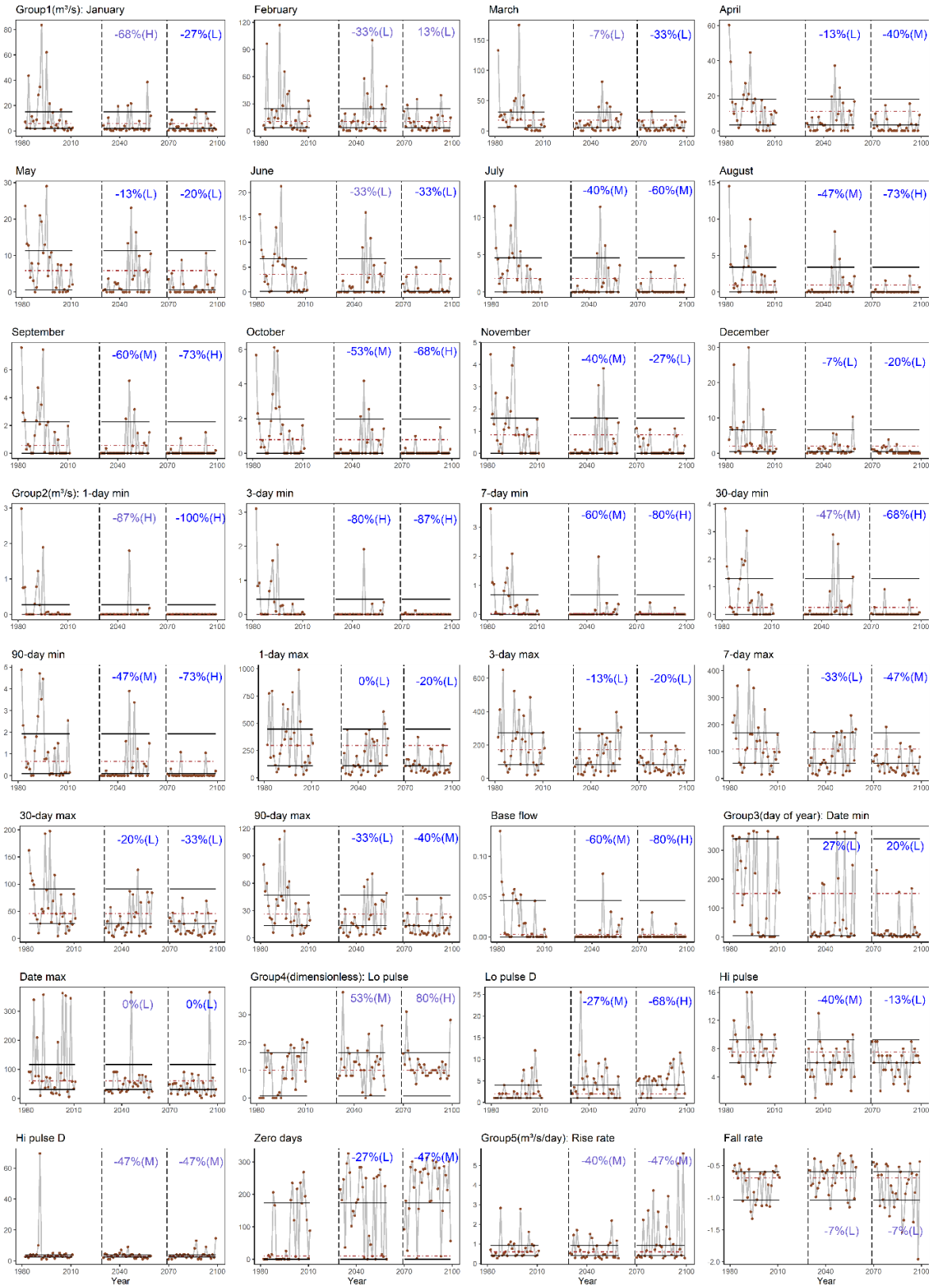
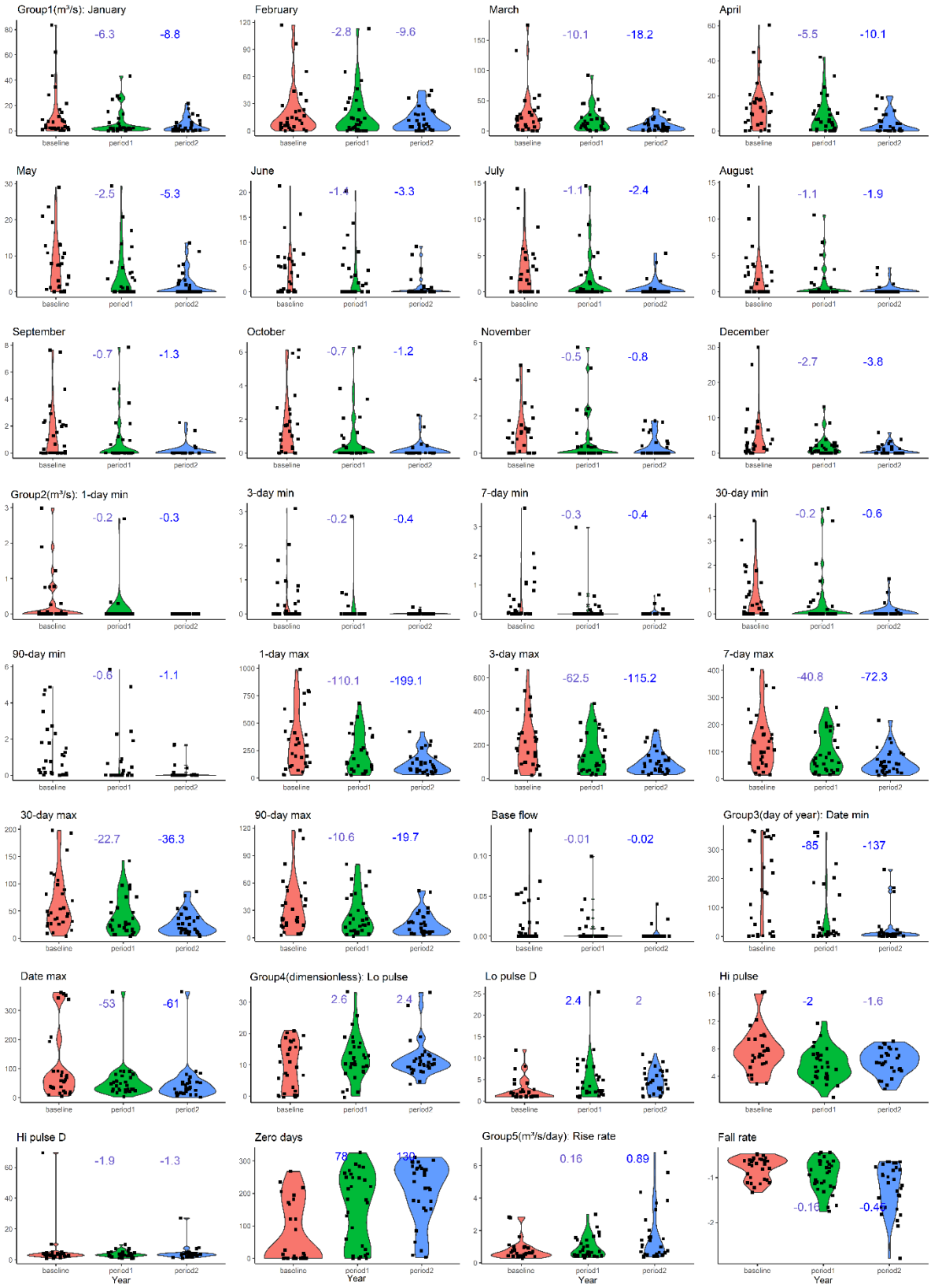
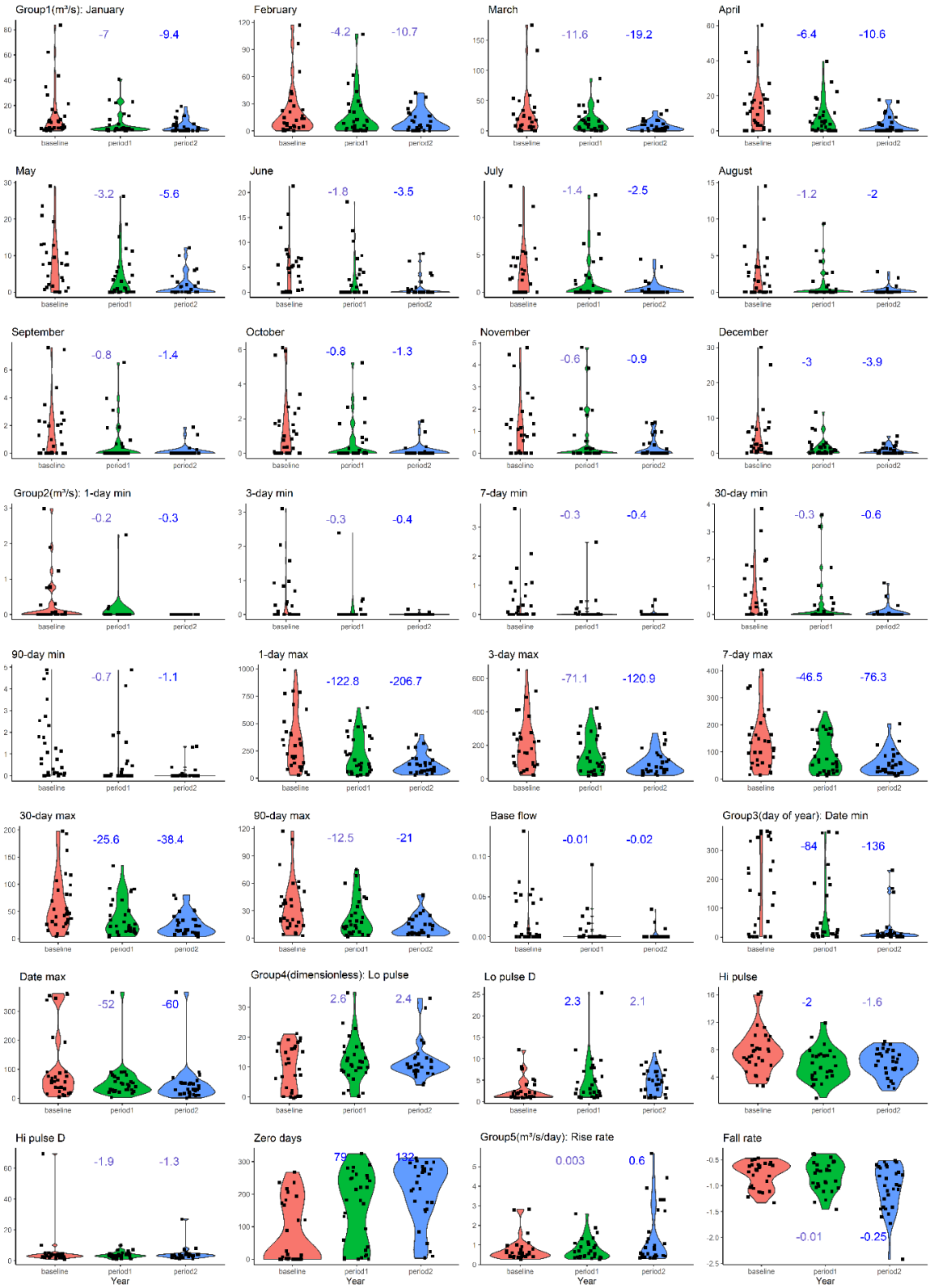


Figure S1: Alteration of 32 IHA (Indicators of Hydrologic Alteration) under three water use system scenarios in the future: No-WUS: the water use systems are not considered, Constant-WUS: the number of water use systems in the basin remain unaltered in the future, and Projected-WUS: the number of water use systems increase linearly with population growth. The red horizontal dashed line shows the median for the model setup period. The black horizontal lines represent the low and high-threshold of RVA (The Range of Variability Approach). The number indicates RVA deviation (%) in light blue and dark blue respectively for insignificant and significant changes.

i)No-WUS Scenario



ii)Constant-WUS Scenario



iii)Projected-WUS Scenario

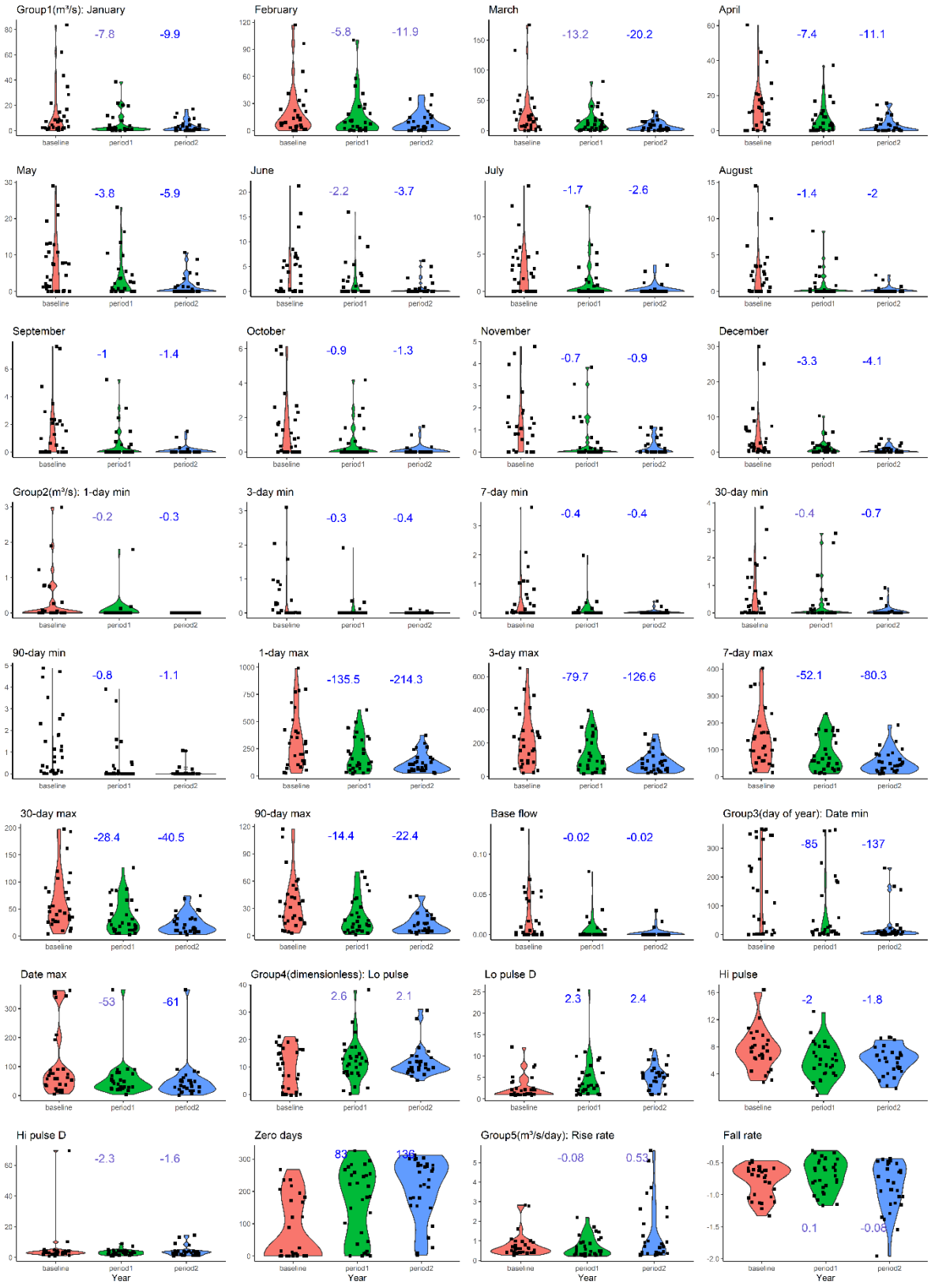


Figure S2: Distribution of annual values for each indicator under three water use system scenarios in the future: No-WUS: the water use systems are not considered, Constant-WUS: the number of water use systems in the basin remain unaltered in the future, and Projected-WUS: the number of water use systems increase linearly with population growth. Each single dot represents the value calculated for a specific indictor e.g., month January, in a year. Absolute changes are highlighted in light and dark blue respectively for insignificant and significant changes.