

Supporting Information

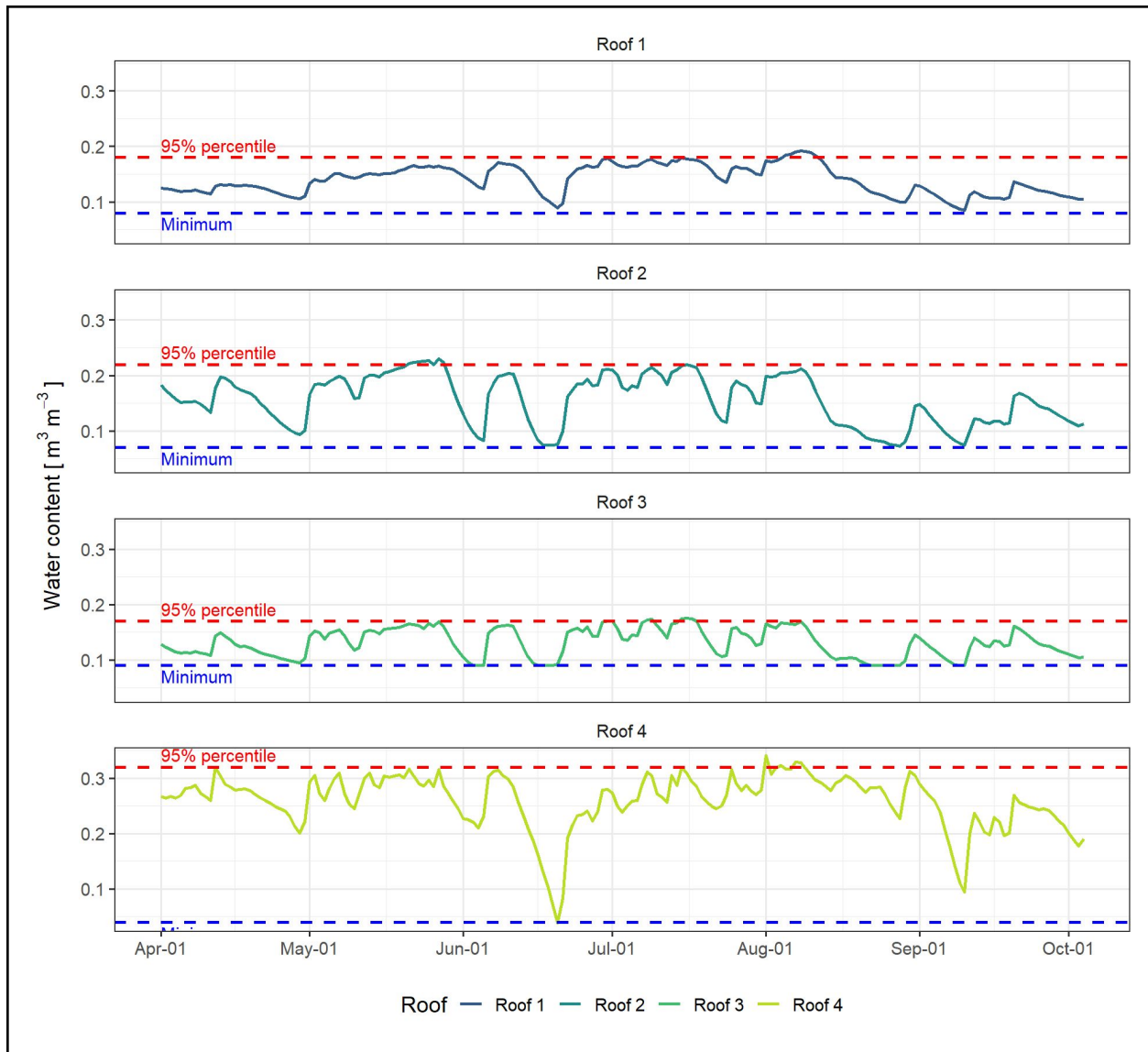


Fig. S1: Cleaned and gap-filled substrate layer water content time series for all four green roof types with derived maximum storage capacity (as 95% percentile) and minimum storage (as minimum). Roof 1 = Garden Roof; Roof 2 = Nature Roof; Roof 3 = Economy Roof; Roof 4 = Retention Roof. Original data obtained from Gößner et al. (2021).

Tab. S1: Results of pairwise comparison using Wilcox signed-rank tests on the distribution of optimized green roof factors k_g . Significance levels are expressed as not-significantly different (ns), significantly different (*), and highly significantly different (**) based on the resulting adjusted p-value.

Green roof type 1	Green roof type 2	p_{adj}	Significance
Economy Roof	Garden Roof	0.01	*
Economy Roof	Nature Roof	0.37	ns
Economy Roof	Retention Roof	<.01	**
Garden Roof	Nature Roof	<.01	**
Garden Roof	Retention Roof	0.02	*
Nature Roof	Retention Roof	<.01	**

Tab S2: Results of paired Wilcoxon signed-rank tests for statistical significance of comparisons for green roof type predicted relative storage time series data for the dry, average, and wet reference years. Significance levels are expressed as not-significantly different (ns), significantly different (*), and highly significantly different (**) based on the resulting adjusted p-value.

Reference year	Green roof type 1	Green roof type 2	Layer	p_adj	Significance level
Dry year	Economy Roof	Garden Roof	Retention layer	0.96	ns
			Substrate layer	0.72	ns
	Economy Roof	Nature Roof	Retention layer	0.60	ns
			Substrate layer	0.77	ns
	Economy Roof	Retention Roof	Retention layer	0.53	ns
			Substrate layer	0.01	*
	Garden Roof	Nature Roof	Retention layer	0.67	ns
			Substrate layer	0.52	ns
	Garden Roof	Retention Roof	Retention layer	0.48	ns
			Substrate layer	0.01	*
	Nature Roof	Retention Roof	Retention layer	0.28	ns
			Substrate layer	<0.01	**

Average year	Economy Roof	Garden Roof	Retention layer	<0.01	**
			Substrate layer	<0.01	**
	Economy Roof	Nature Roof	Retention layer	<0.01	**
			Substrate layer	0.01	*
	Economy Roof	Retention Roof	Retention layer	<0.01	**
			Substrate layer	<0.01	**
	Garden Roof	Nature Roof	Retention layer	0.049	*
			Substrate layer	<0.01	**
	Garden Roof	Retention Roof	Retention layer	0.06	ns
			Substrate layer	0.47	ns
	Nature Roof	Retention Roof	Retention layer	0.88	ns
			Substrate layer	0.10	ns
Wet year	Economy Roof	Garden Roof	Retention layer	0.10	ns
			Substrate layer	<0.01	**
	Economy Roof	Nature Roof	Retention layer	0.43	ns

			Substrate layer	0.22	ns
	Economy Roof	Retention Roof	Retention layer	0.80	ns
			Substrate layer	<0.01	**
	Garden Roof	Nature Roof	Retention layer	0.38	ns
			Substrate layer	<0.01	**
	Garden Roof	Retention Roof	Retention layer	0.12	ns
			Substrate layer	0.17	ns
	Nature Roof	Retention Roof	Retention layer	0.58	ns
			Substrate layer	0.12	ns