This supplementary material provides additional details that support the main article titled "Integrating Sentinel-1 SAR and Machine Learning Models for Optimal Soil Moisture Sensor Placement at Catchment Scale."

Table S1. Results of leave-one-station-out cross-validation (LOSO-CV) for the GPR model.

Station ID	SAR-based value (%)	Predicted value (%)	Difference (%)
1	73.36	63.69	-9.67
2	61.94	65.12	3.18
3	61.57	65.16	3.59
4	74.96	65.83	-9.14
5	72.93	63.74	-9.19
6	49.52	66.67	17.14
7	65.53	62.52	-3.01
8	53.70	54.63	0.93
9	69.35	64.19	-5.16

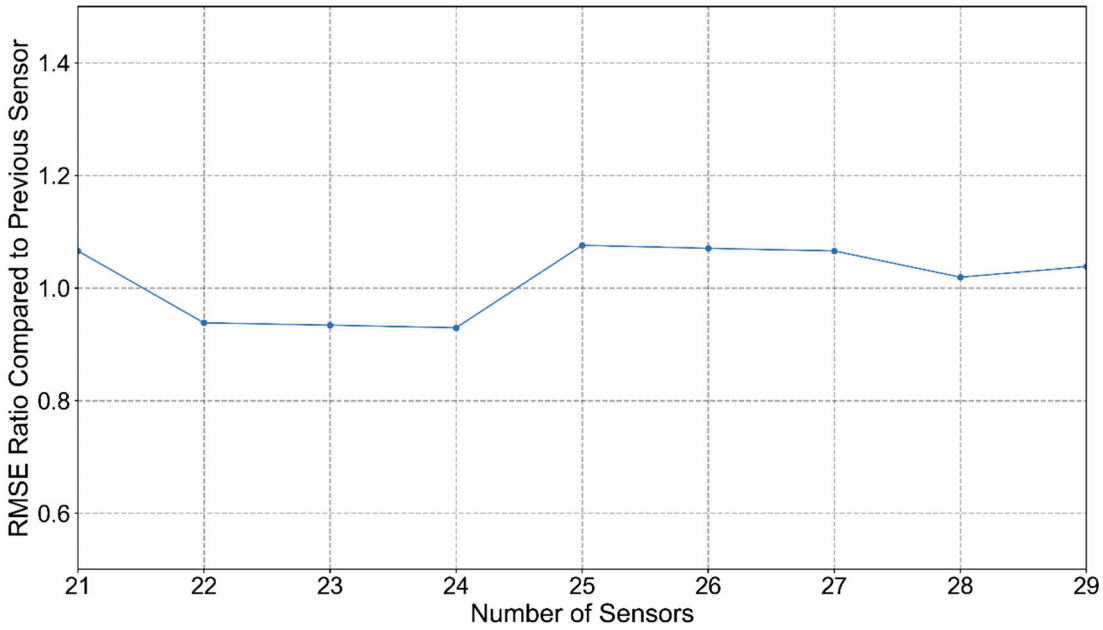


Figure S1. RMSE ratio between consecutive sensor configurations (20–30 sensors)

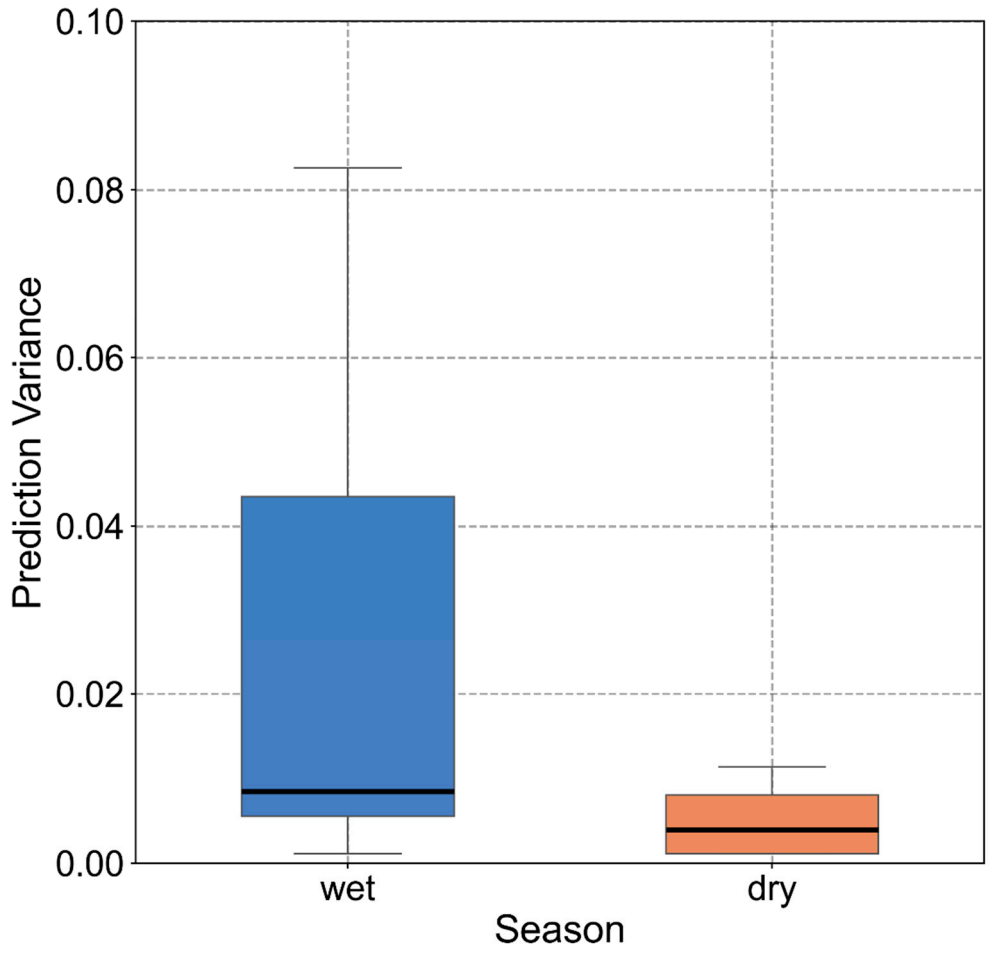


Figure S2. Boxplot comparison of GPR prediction variance between wet and dry seasons.