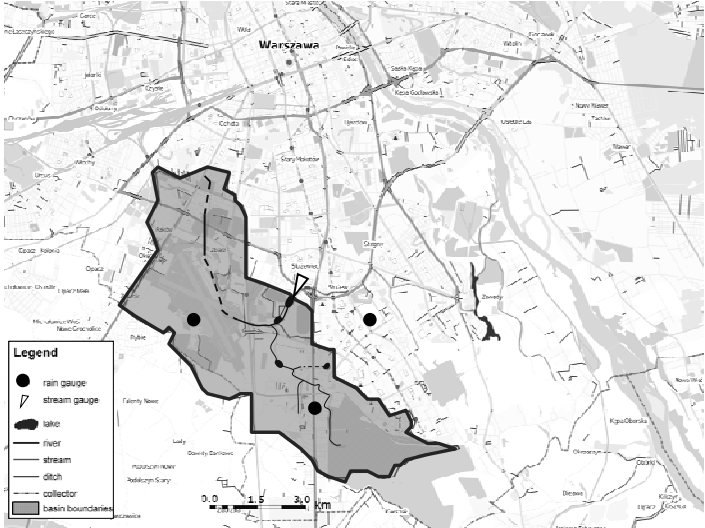
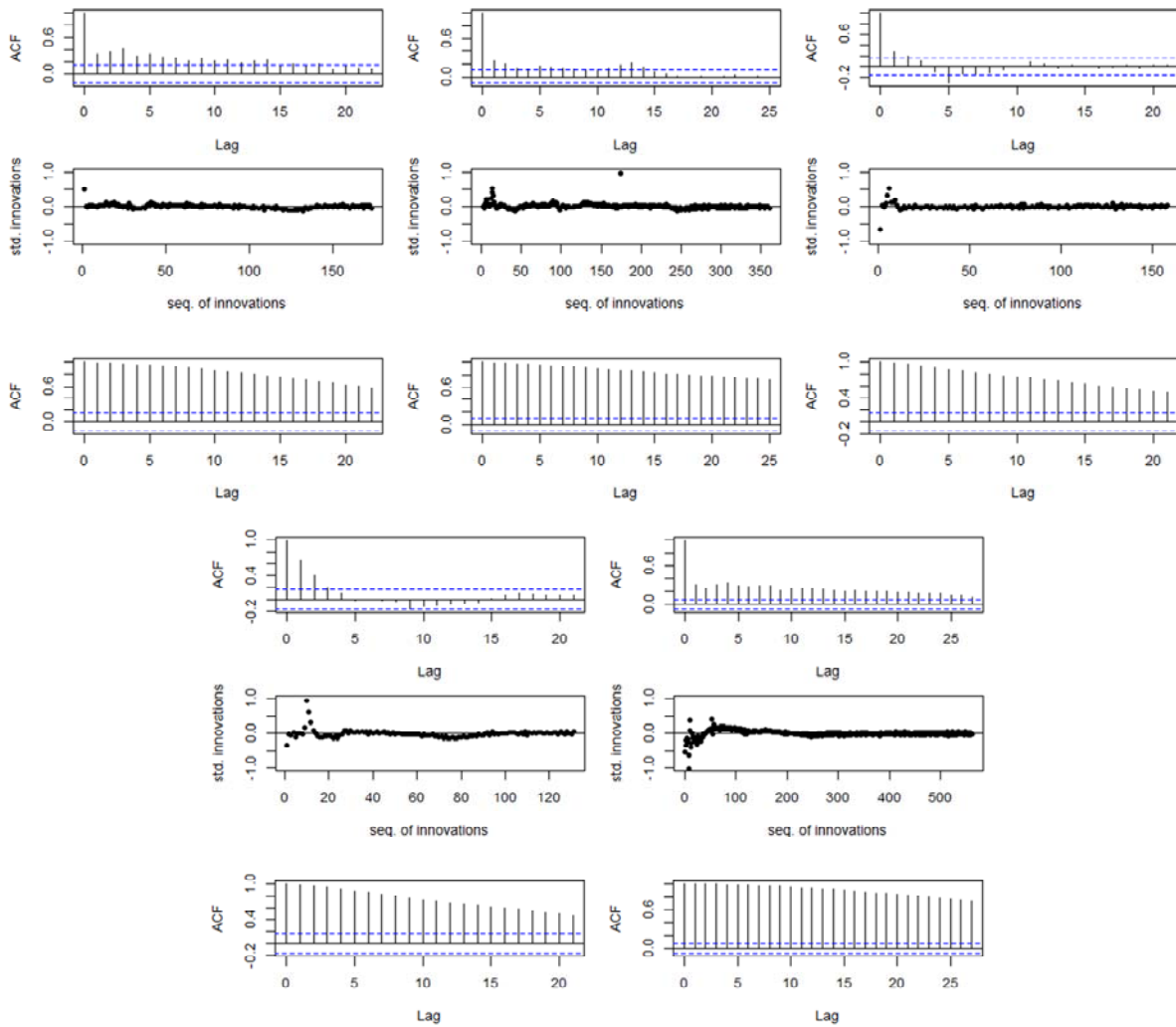


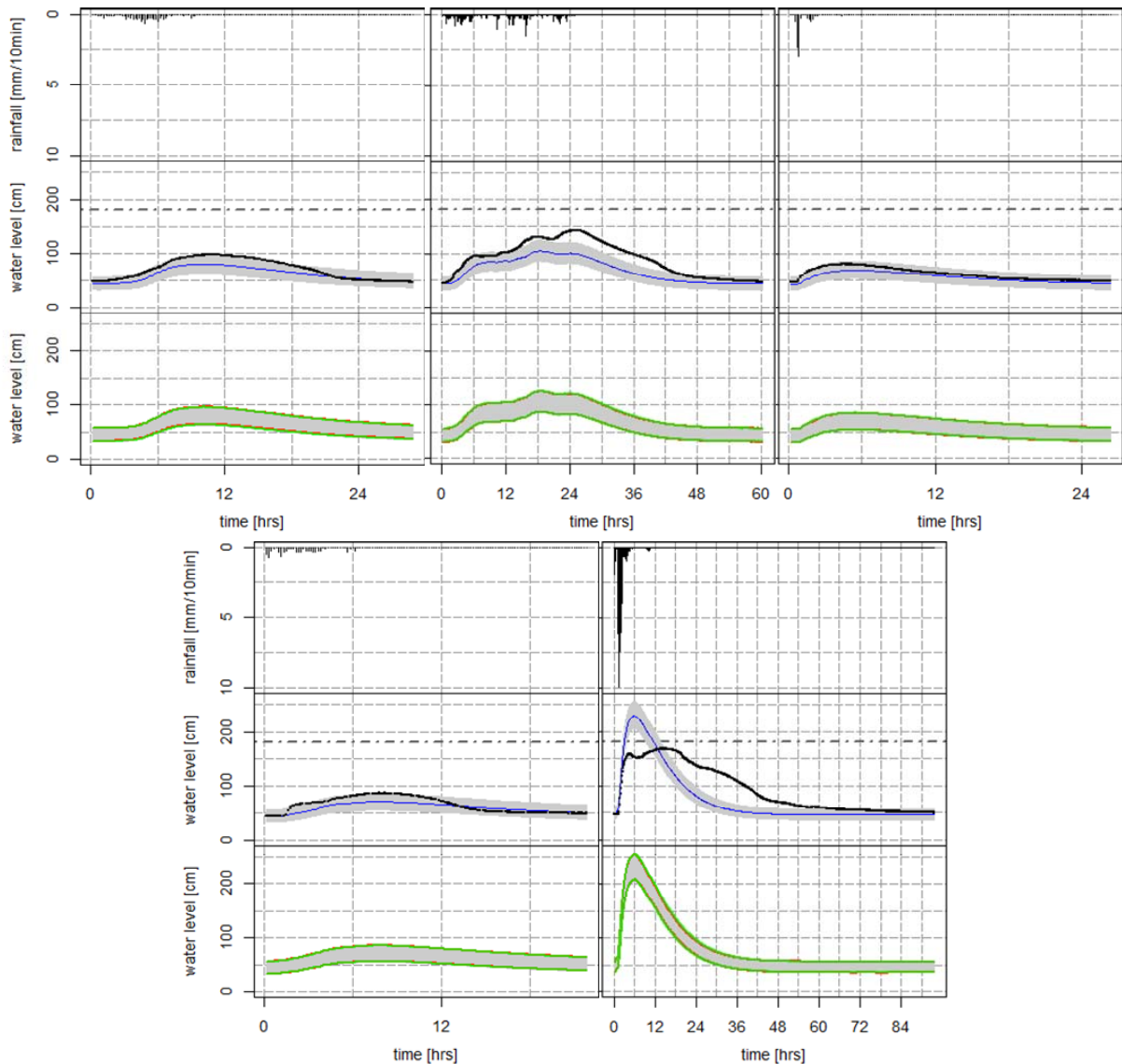
Supplementary material



A1 Overview of a Sluzew Creek catchment and gauge sites



A2 Diagnostic plot of innovations and residuals for the remaining events (No. 1-4, 8); Lumped error model: autocorrelation function (ACF) of standardized innovations (top row) and sequences of innovations (middle row), Traditional error model: ACF of standardized residuals (bottom row).



A3 Predicted water levels in the Sluzew Creek using the posterior parameter distribution for the remaining events (top: No. 1-3, bottom: No. 4, 8). Dotted black lines present observations, solid blue lines illustrate predicted water levels corresponding to the mode posterior values, grey areas - 95% total prediction uncertainty bands, dashed grey horizontal line cuts the RC extrapolation range, red lines - 95% limits for the predictive uncertainty bands whilst ignoring uncertainty in RR parameters (scenario B), green lines - 95% limits for the predictive uncertainty bands whilst ignoring uncertainty in RC parameters (scenario A)