Supplementary Materials – Equations

Correlation coefficient (S1), Root Mean Square Error (RMSE, S2), Nash – Sutcliffe coefficient (NSE, S3) and Kling-Gupta efficiency (KGE, S4)

$$r_{xy} = \frac{S_{xy}}{S_x S_y} \tag{S1}$$

where, r_{xy} is the sample correlation coefficient, S_{xy} is the sample covariance, S_x, S_y are the standard deviations from the measured and simulated values respectively.

$$RMSE = \sqrt{\frac{\sum_{i=1}^{n}(f_i - O_i)^2}{n}} \tag{S2}$$

where, RMSE is the Root mean square error, f_i is the simulated value, O_i is the measured value, n is the number of values.

$$NSE = 1 - \frac{\sum_{t=1}^{T}(O_t - P_t)^2}{\sum_{t=1}^{T}(P_t - \overline{O_t})^2} \tag{S3}$$

where, NSE is the Nash – Sutcliffe coefficient, O_t is the measured streamflow at t time, P_t is simulated streamflow at t time, $\overline{O_t}$ is the average of measured streamflow.

$$KGE_s = 1 - ED_s \tag{S4}$$

$$ED_s = \sqrt{[S_r \cdot (r-1)]^2 + [S_\alpha \cdot (\alpha - 1)]^2 + \left[S_\beta \cdot (\beta - 1)\right]^2}$$

$$\alpha = {Sd_{mod}}/{Sd_{obs}}$$

$$\beta = {\mu_s}/{\mu_o}$$

where, KGE is the Kling-Gupta efficiency, β is the ratio between the mean simulated and mean observed flows (bias), S_α, S_β, S_r are scaling factors that can be used to re-scale the criteria before computing the ideal distance from the ideal point (ED = 1), r is the correlation coefficient.