Figure S1: Correlation between catchment attributes (Table 2) and model performance, i.e. runoff (Eq. 2, left panel), soil moisture (Eq. 5, middle panel) and snow cover (Eq. 6, right panel), obtained from multiple objective calibration to satellite soil moisture (ASCAT) and runoff (Var 1 of Table 5) in the calibration period 2000-2010. Cool and warm colors represent positive and negative correlations, respectively. Bold print indicates significance with p-value lower than 0.05.
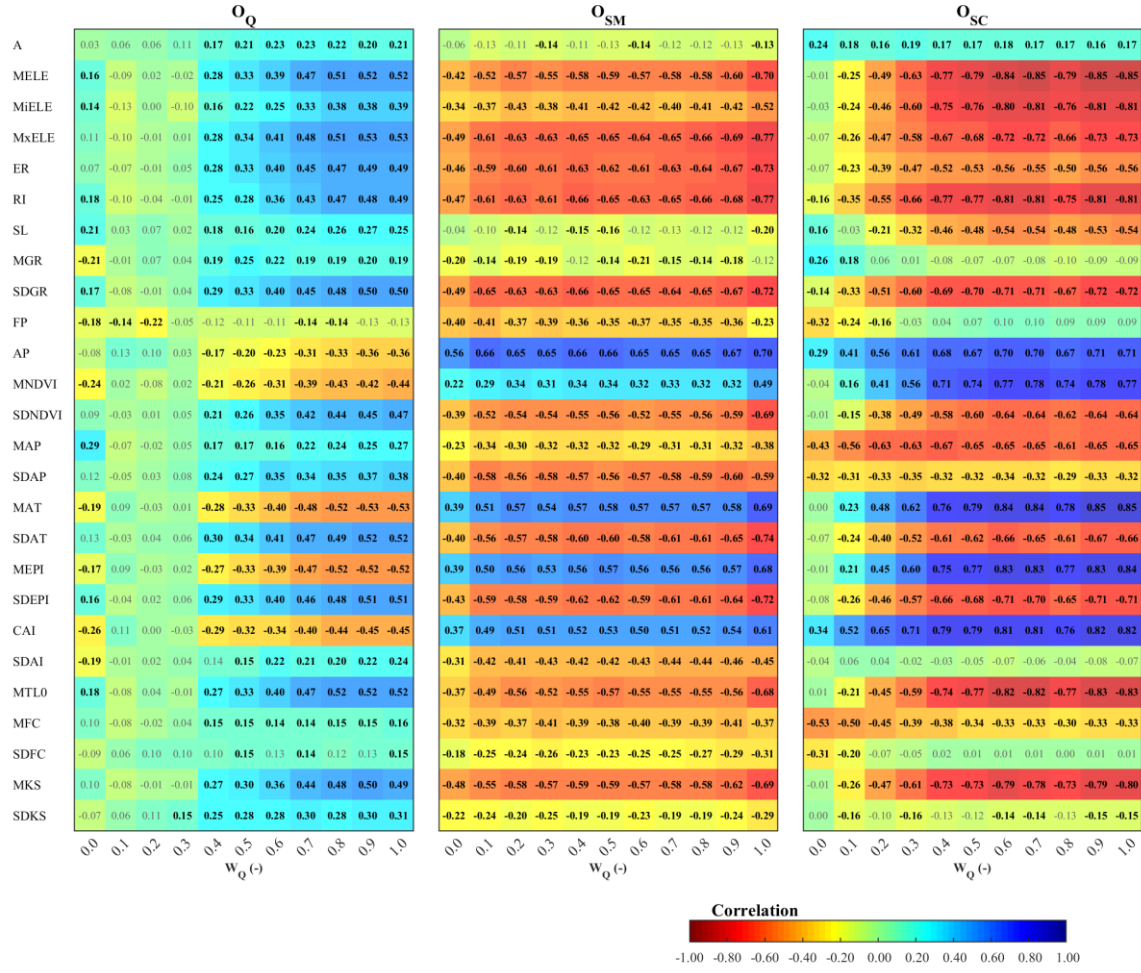
Figure S2: Correlation between catchment attributes (Table 2) and model performance, i.e. runoff (Eq. 2, left panel), soil moisture (Eq. 5, middle panel) and snow cover (Eq. 6, right panel), obtained from multiple objective calibration to satellite soil moisture (ASCAT) and runoff (Var 1 of Table 6) in the validation period 2010-2014. Cool and warm colors represent positive and negative correlations, respectively. Bold print indicates significance with p-value lower than 0.05.
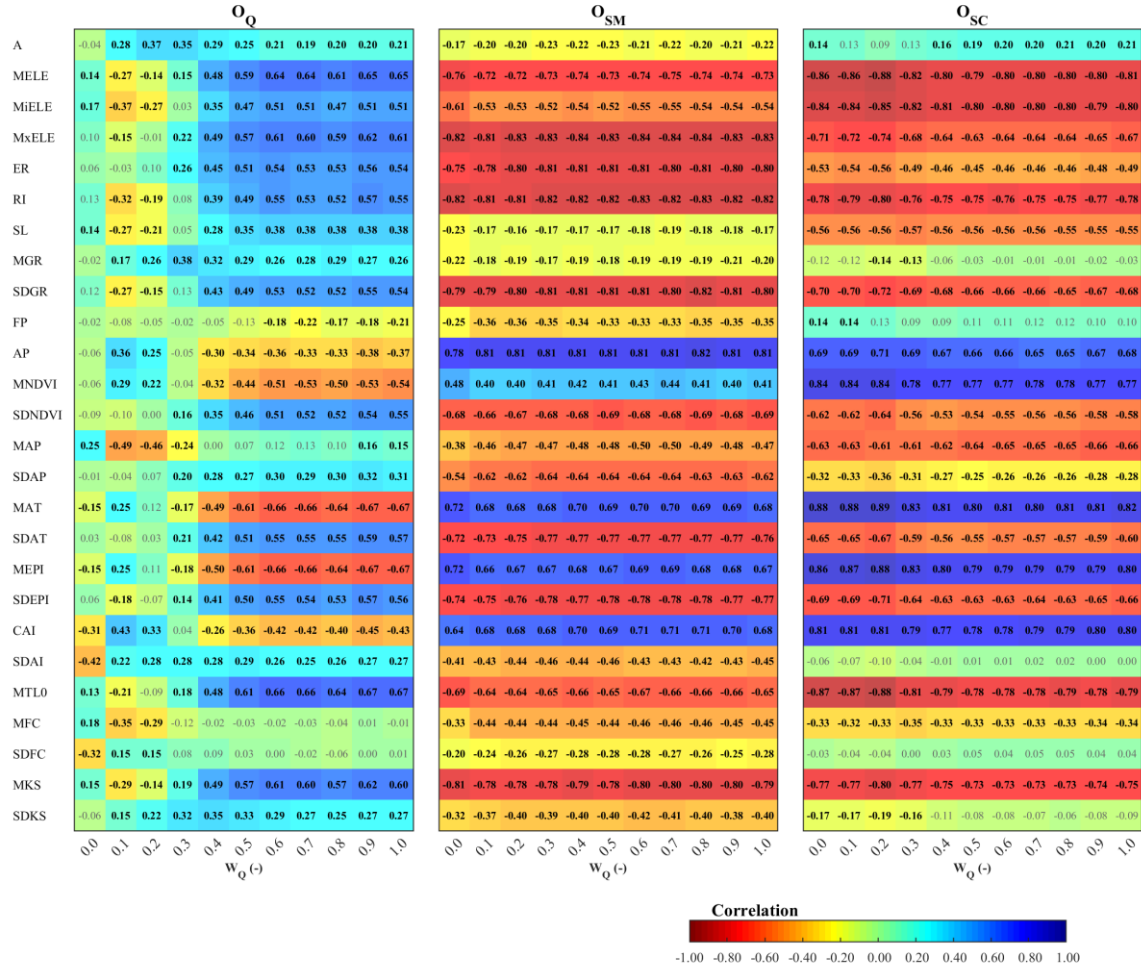
Figure S3: Correlation between catchment attributes (Table 2) and model performance, i.e. runoff (Eq. 2, left panel), soil moisture (Eq. 5, middle panel) and snow cover (Eq. 6, right panel), obtained from multiple objective calibration to satellite snow cover (MODIS) and runoff (Var 2 of Table 5) in the calibration period 2000-2010. Cool and warm colors represent positive and negative correlations, respectively. Bold print indicates significance with p-value lower than 0.05.
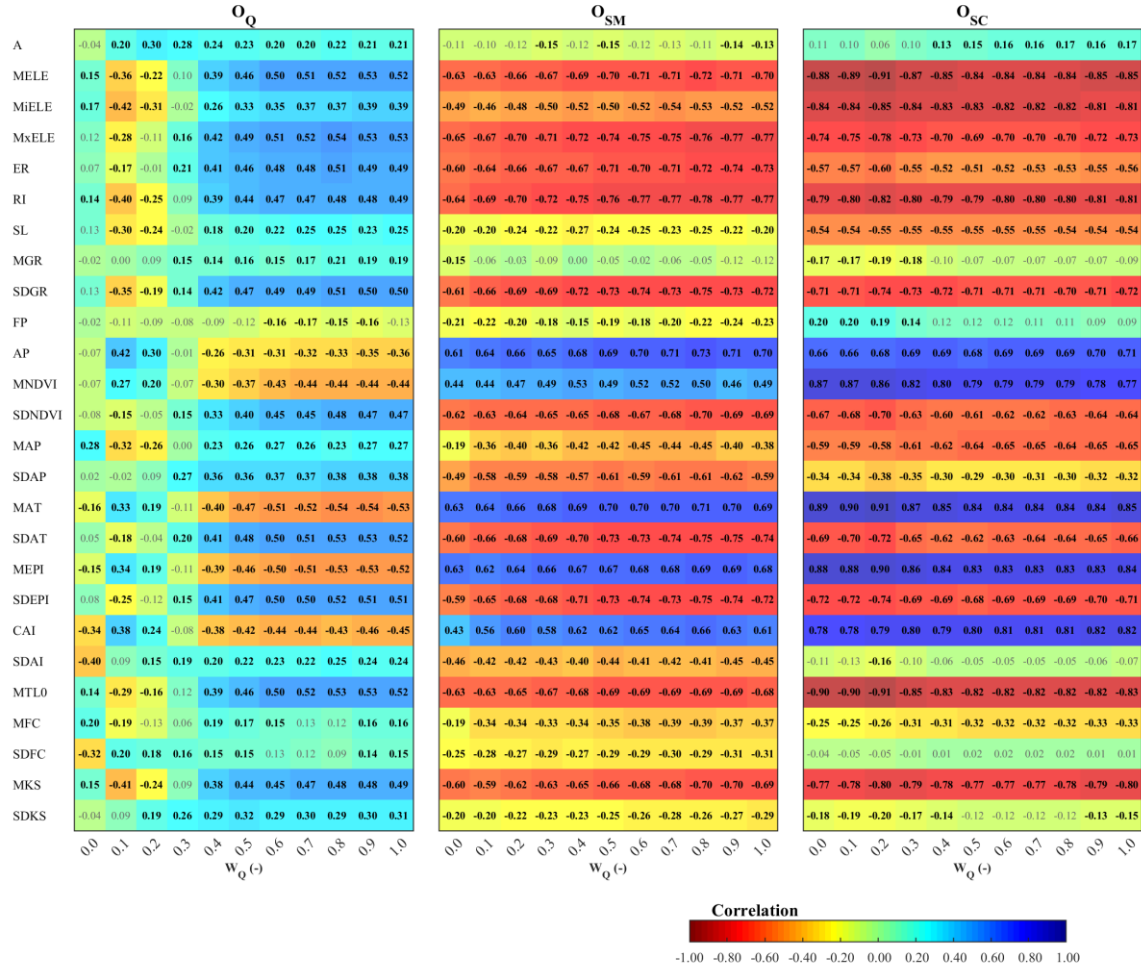
Figure S4: Correlation between catchment attributes (Table 2) and model performance, i.e. runoff (Eq. 2, left panel), soil moisture (Eq. 5, middle panel) and snow cover (Eq. 6, right panel), obtained from multiple objective calibration to satellite snow cover (MODIS) and runoff (Var 2 of Table 6) in the validation period 2010-2014. Cool and warm colors represent positive and negative correlations, respectively. Bold print indicates significance with p-value lower than 0.05.