

Danube Water Balance

Tisza River Basin

Tisza River Basin – characteristics

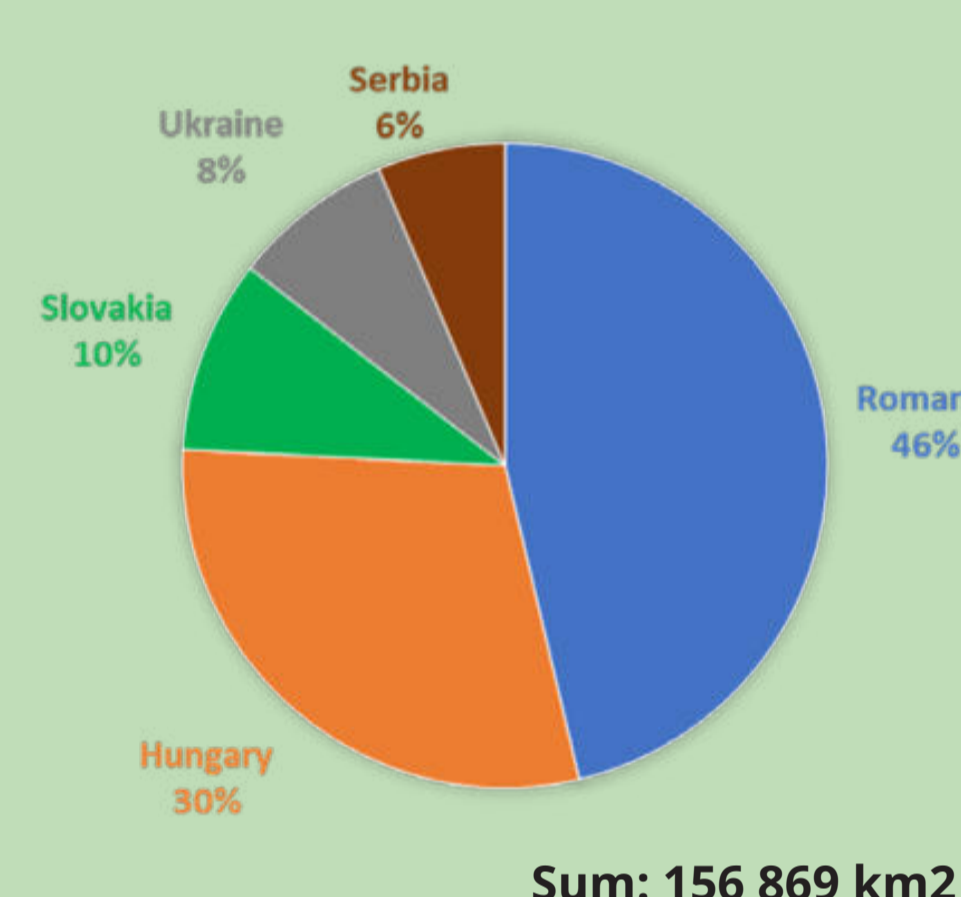
Karst areas with sinkholes and springs



Mountainous areas with rapid accumulation

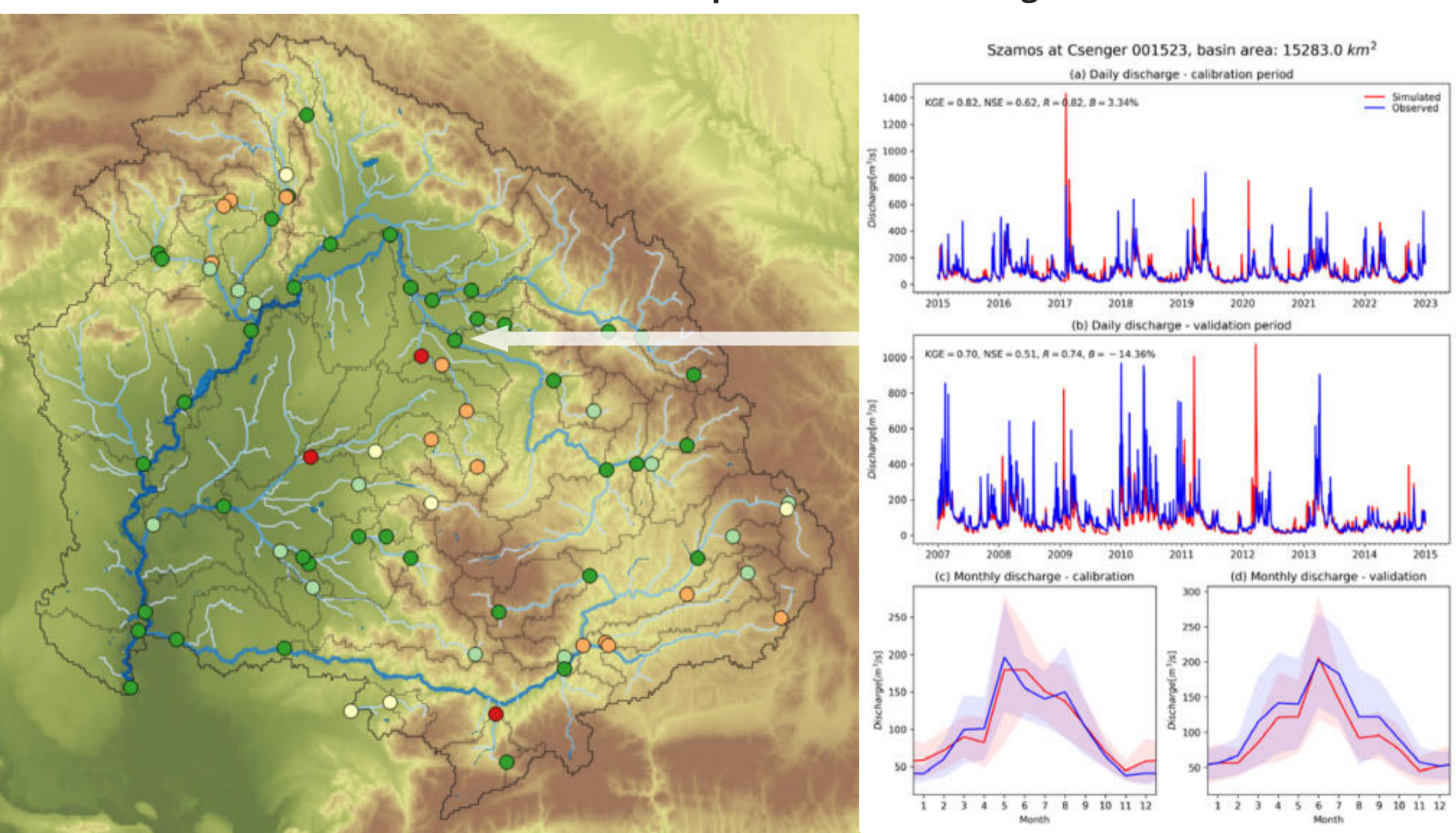


Low-lying region with water levels and groundwater upwelling

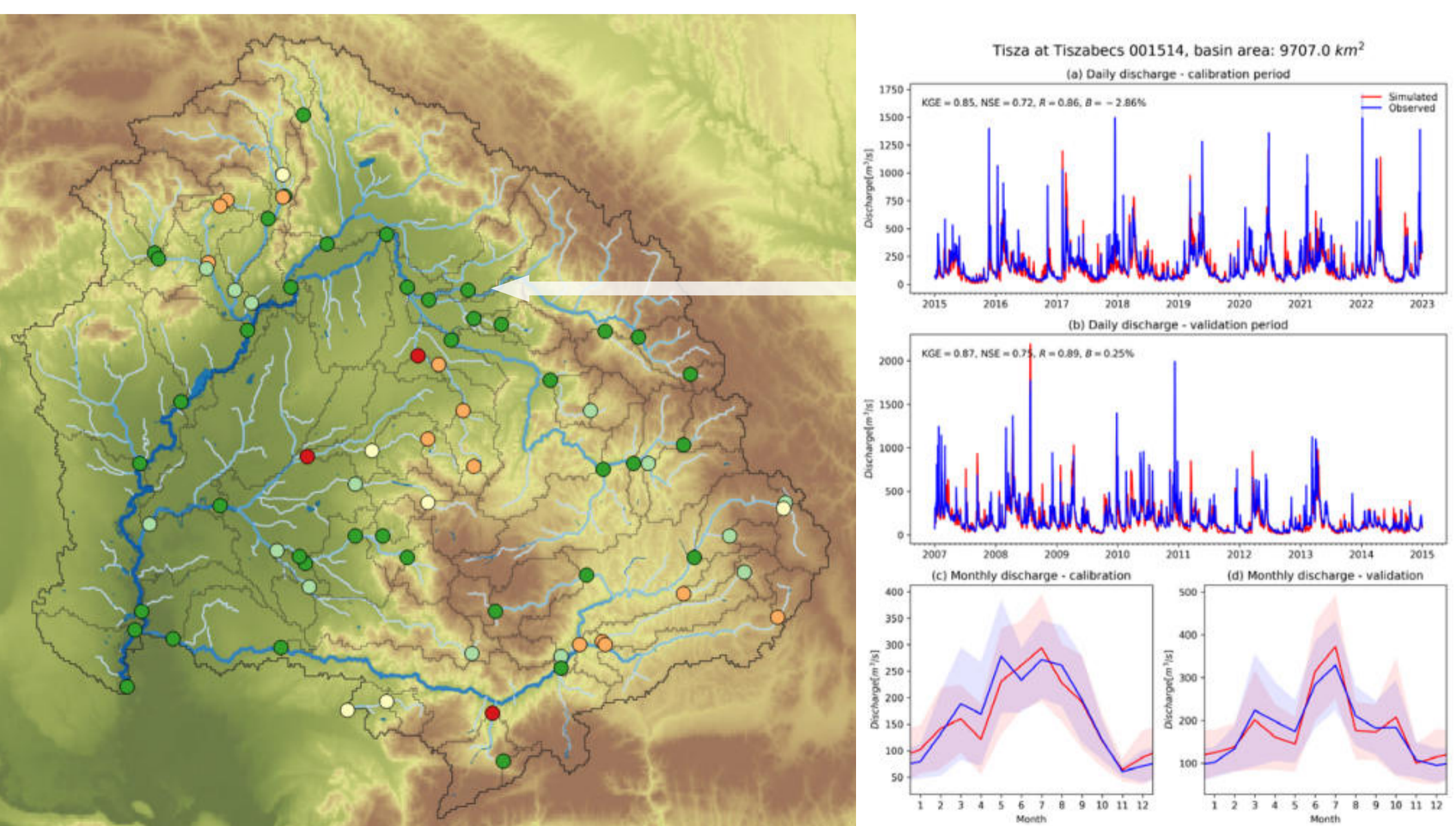


Tisza River Basin – Work results

The figure shows the results obtained for the water gauge at Csenger on the Szamos River. The associated catchment area is 15,283 km². The calculated water yields correspond well to the measured data: the model efficiency is high (KGE, NSE), and the volumetric error (B) is acceptable. Significant overestimation can only be seen in a few major flood peaks. These can be attributed to the parameter describing snowmelt.

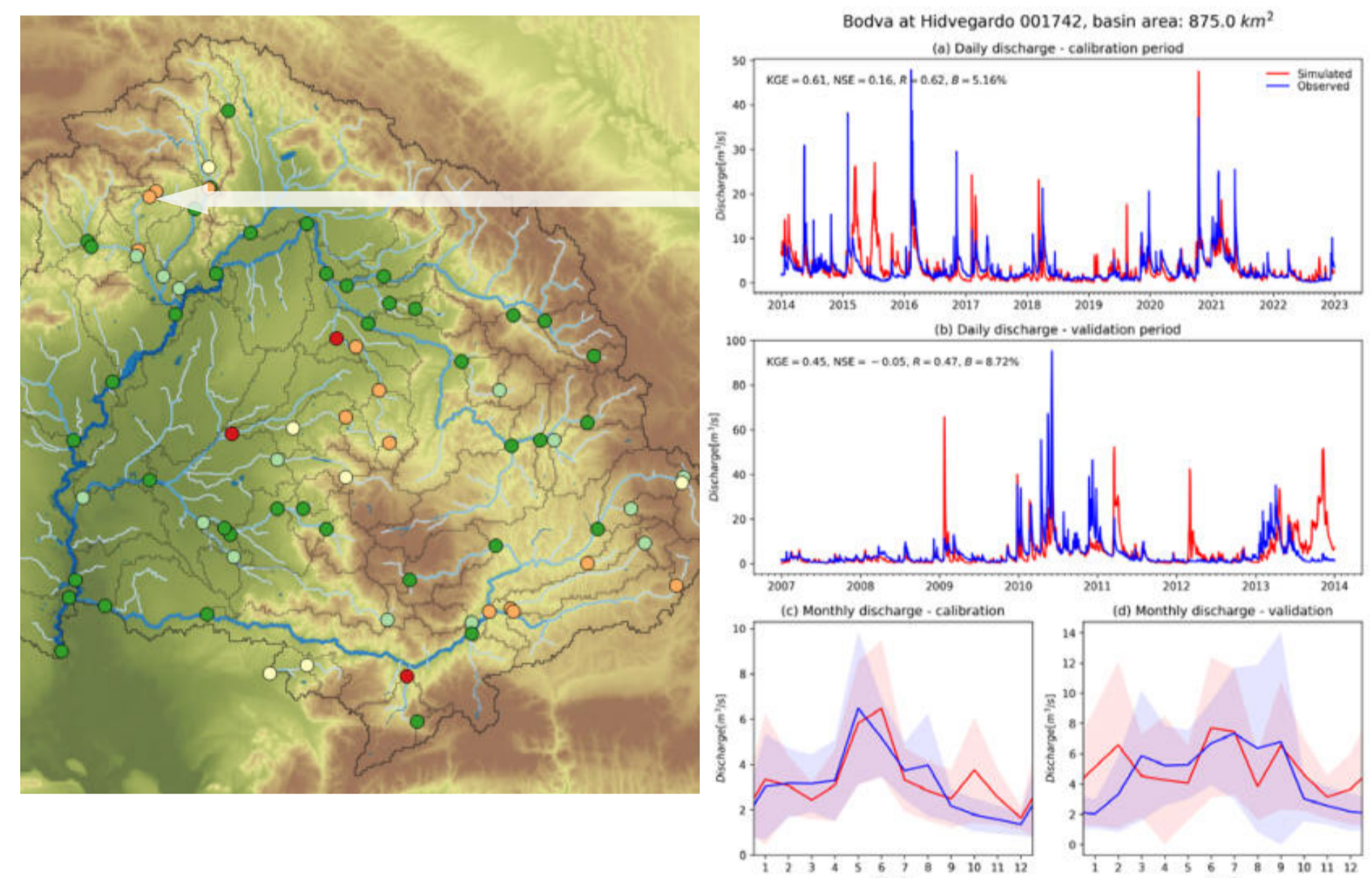


Comparison of the Tisza border section at Tiszabecs. The associated catchment area is 9,707 km². The calculated water yields fit the measured data perfectly: the model efficiency (KGE, NSE) is outstanding, and the volumetric error (B) is low. There are no significant underestimations or overestimations.

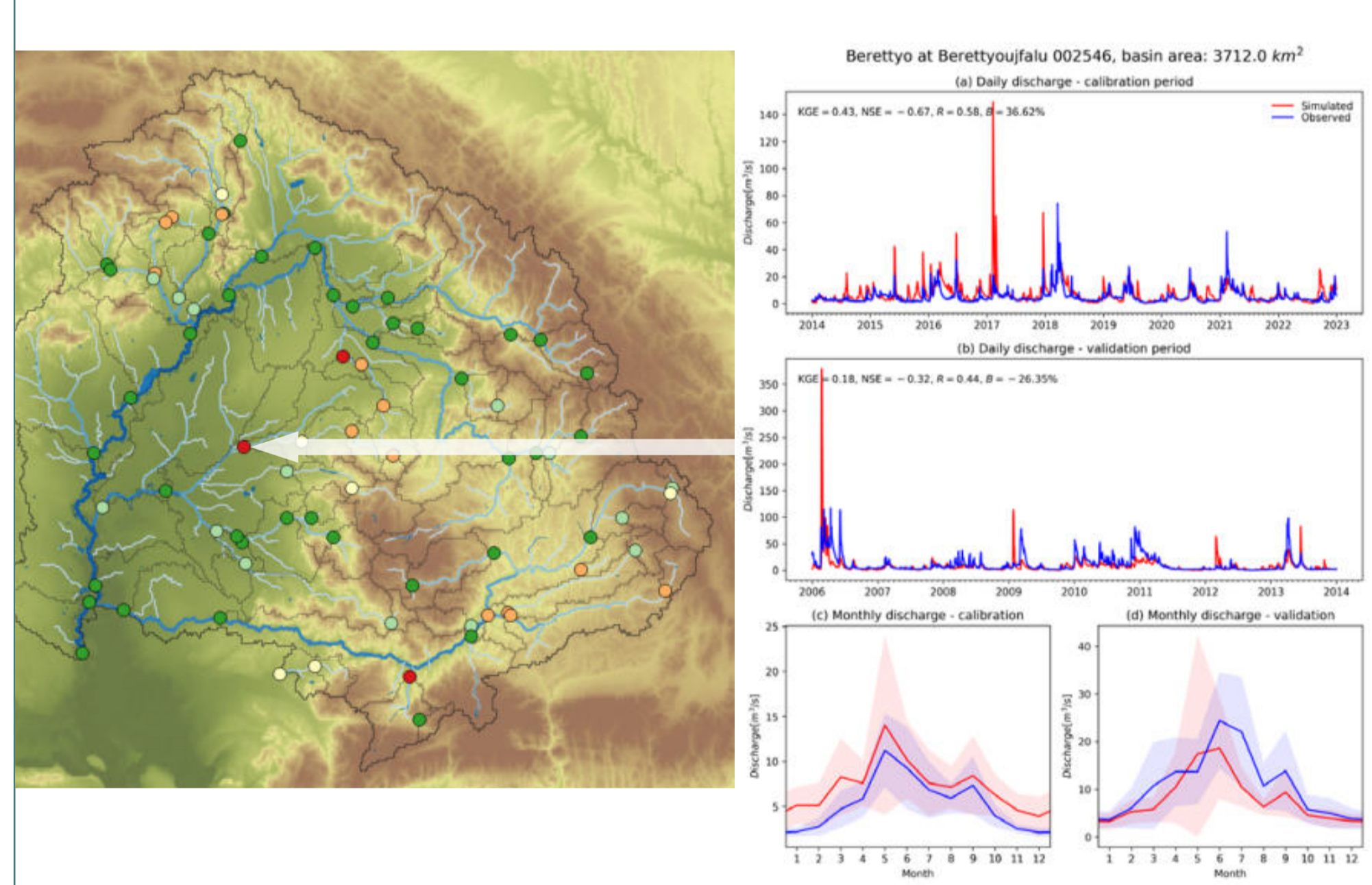


Tisza River Basin – Work results

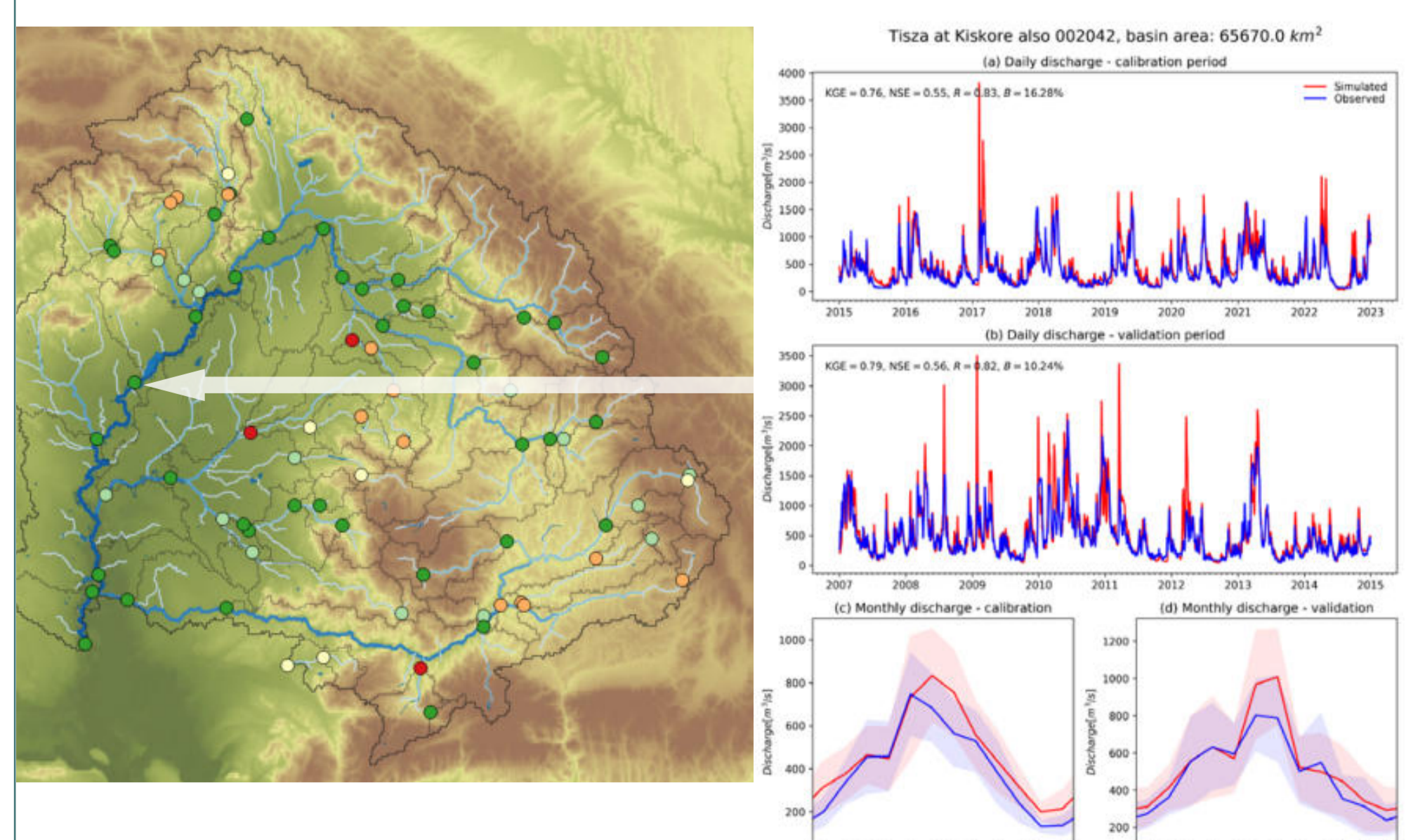
Comparison of the Bódva section at Hidvégyardó. The associated catchment area is 875 km². The calculated water flows do not match the measured data very well: model efficiency (KGE, NSE) is low, and the volumetric error (B) is moderate. The model consistently underestimates the water flow during low water periods, while it also inaccurately estimates the peak flow and timing of flood waves. This is mainly due to the small catchment area.



Comparison for the Berettyó section in Berettyóújfalú. The associated catchment area is 3712 km². The calculated water flows do not correspond well with the measured data: model efficiency (KGE, NSE) is lowest in this gauge section, the volumetric error (B) is high, and the model overestimates during the calibration period and significantly underestimates during validation. This phenomenon is due to the highly regulated nature of the watercourse system.

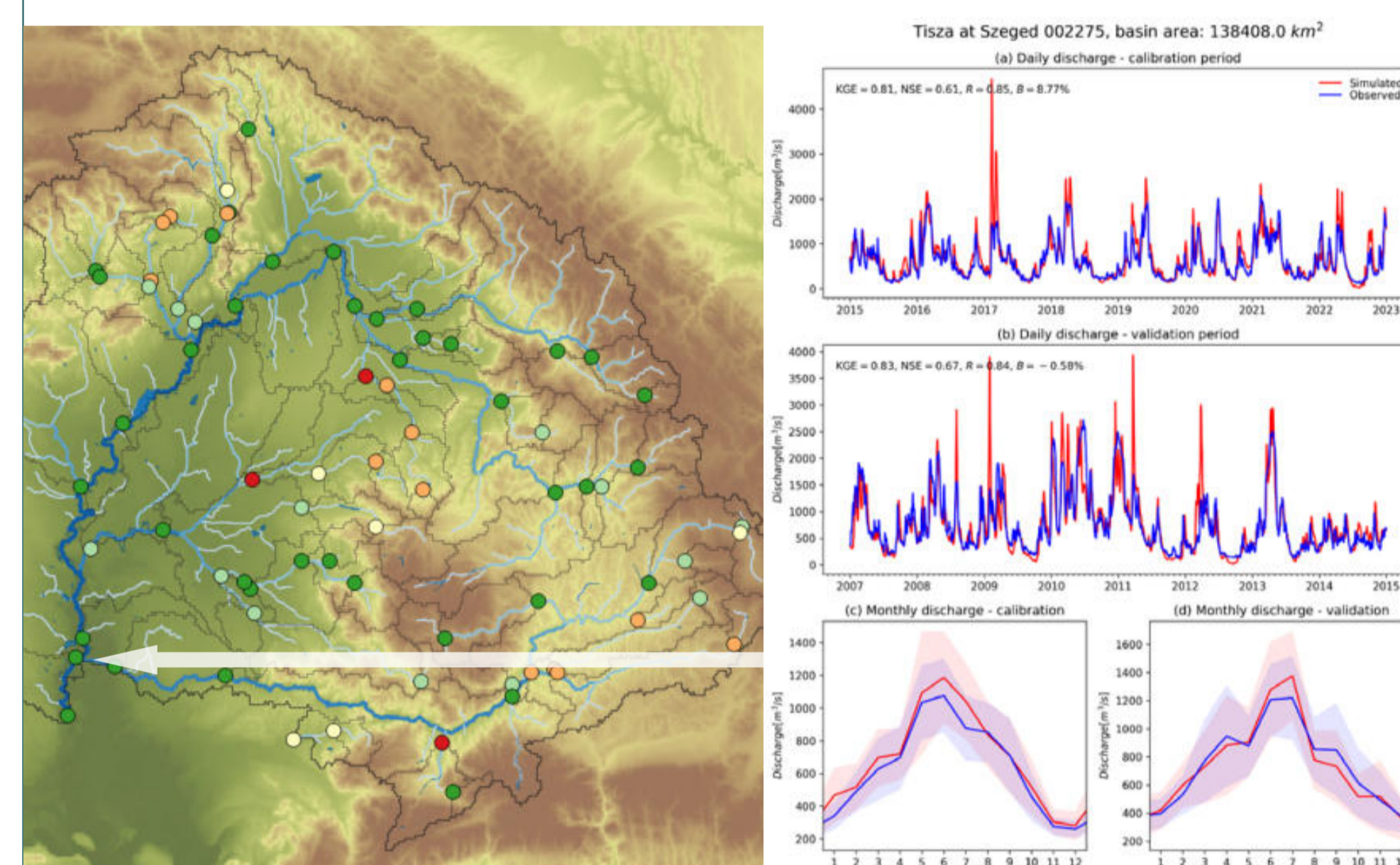


Comparison for the lower section of the Tisza in Kisköre. The associated catchment area is 65,670 km². The calculated water flows fit the measured data well: the model efficiency (KGE, NSE) is adequate, and the volumetric error (B) is moderate. The model correctly simulates the timing of flood peaks, but consistently overestimates the water flow. This is because the incorporation of the flood control operation of the Kisköre dam into the model is still in progress.



Tisza River Basin – Work results

Comparison for the Szeged section of the Tisza. The associated catchment area is 138,408 km². The calculated water flows fit the measured data well: the model efficiency (KGE, NSE) is high, and the volumetric error (B) is medium/low. The model correctly simulates the timing of flood peaks, but consistently overestimates the water flow. This is because the incorporation of the flood control operation of the Kisköre dam into the model is still in progress.



Comparison of sub-surface water reserves in the catchment area extending to the Szeged section of the Tisza River (138,408 km²). The measured data show the gravimetrically estimated change in sub-surface reserves from the GRACE satellite mission, while the calculated data are the CWatM-simulated equivalents. The agreement can be considered adequate in both the calibration and validation periods.

