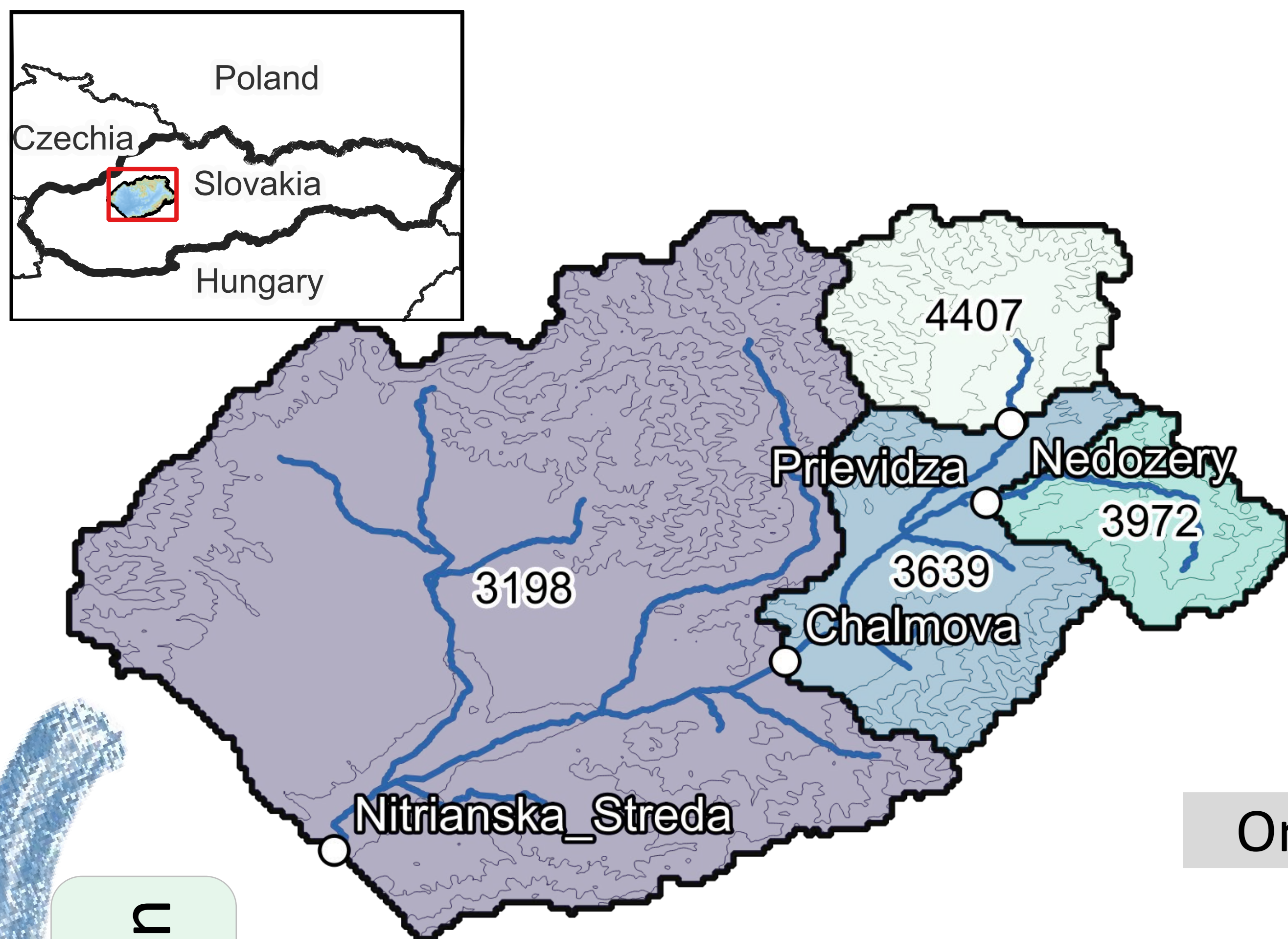


Estimation of the water balance in the Nitra River basin, Slovakia

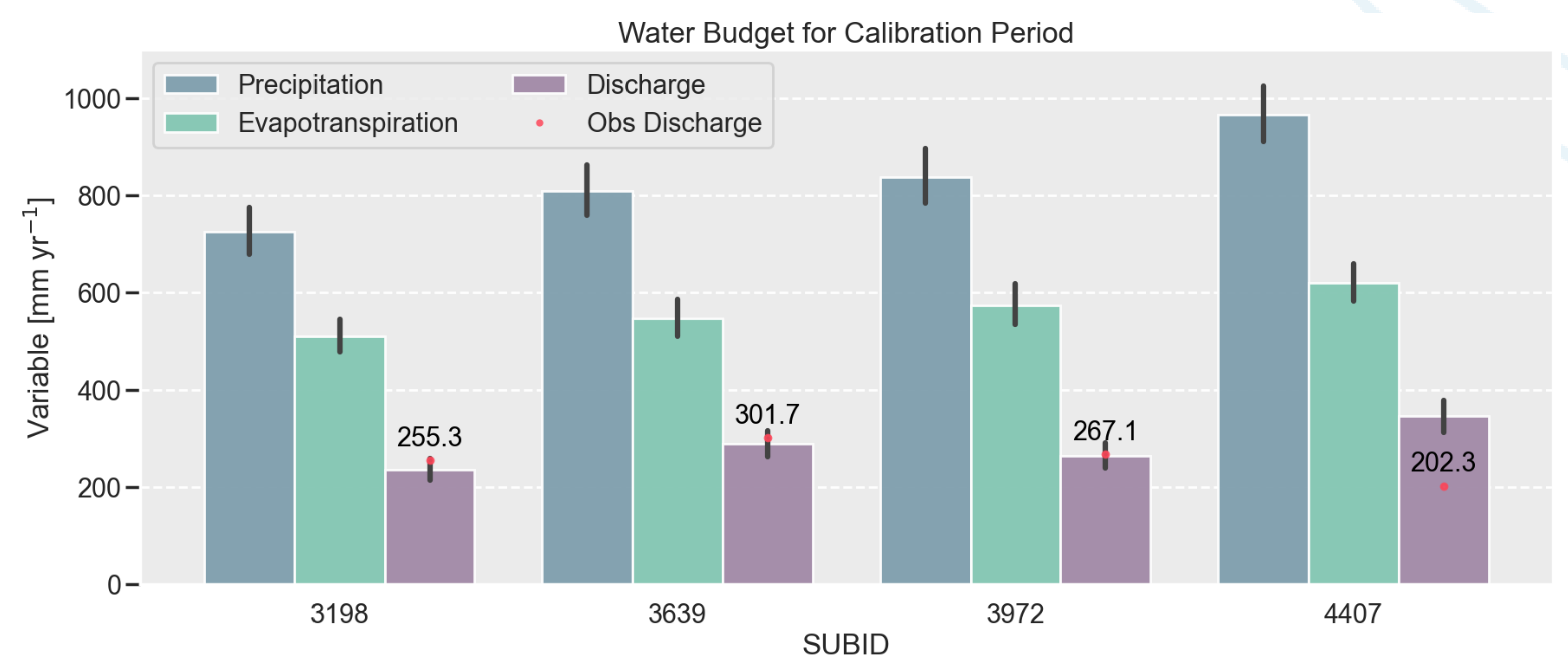
Omar Cenobio-Cruz^a, Róbert Blaško^b, and Giuliano Di Baldassarre^{a,c}

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Understanding the hydrological behaviour and thus estimating the water balance in the upper part of the Nitra River basin. Through the use of in situ observations, remote sensing data, and a semi-distributed hydrological model.



Key Components of the Water Budget



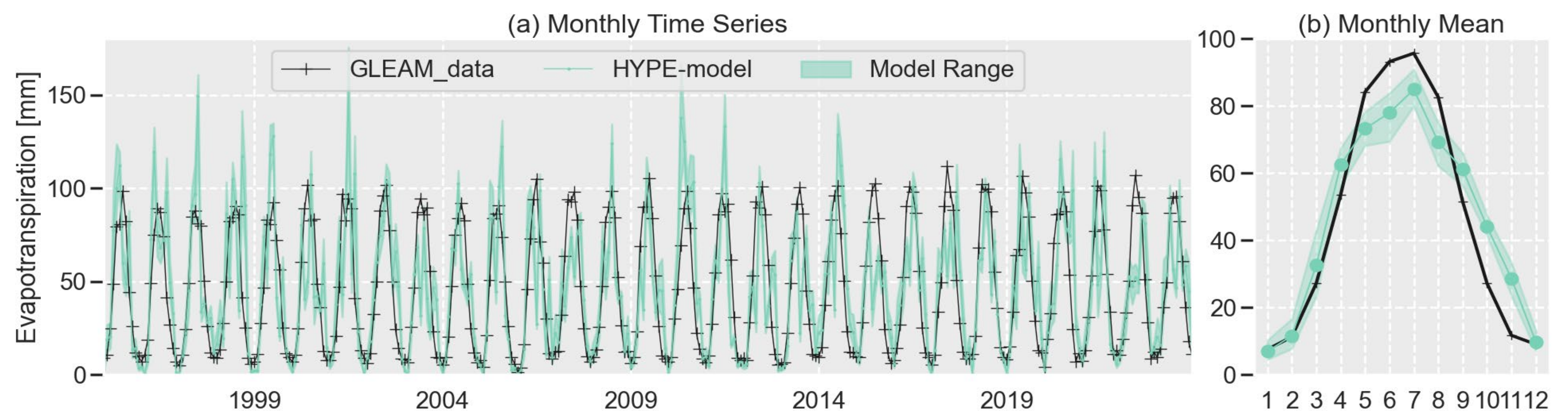
On average:

65% of precipitation translates into ET
35% of precipitation translates into Q

Evapotranspiration

Reference:
GLEAM data
(Miralles et al., 2011)

CC=0.71
RMSE=25.7
[mm]



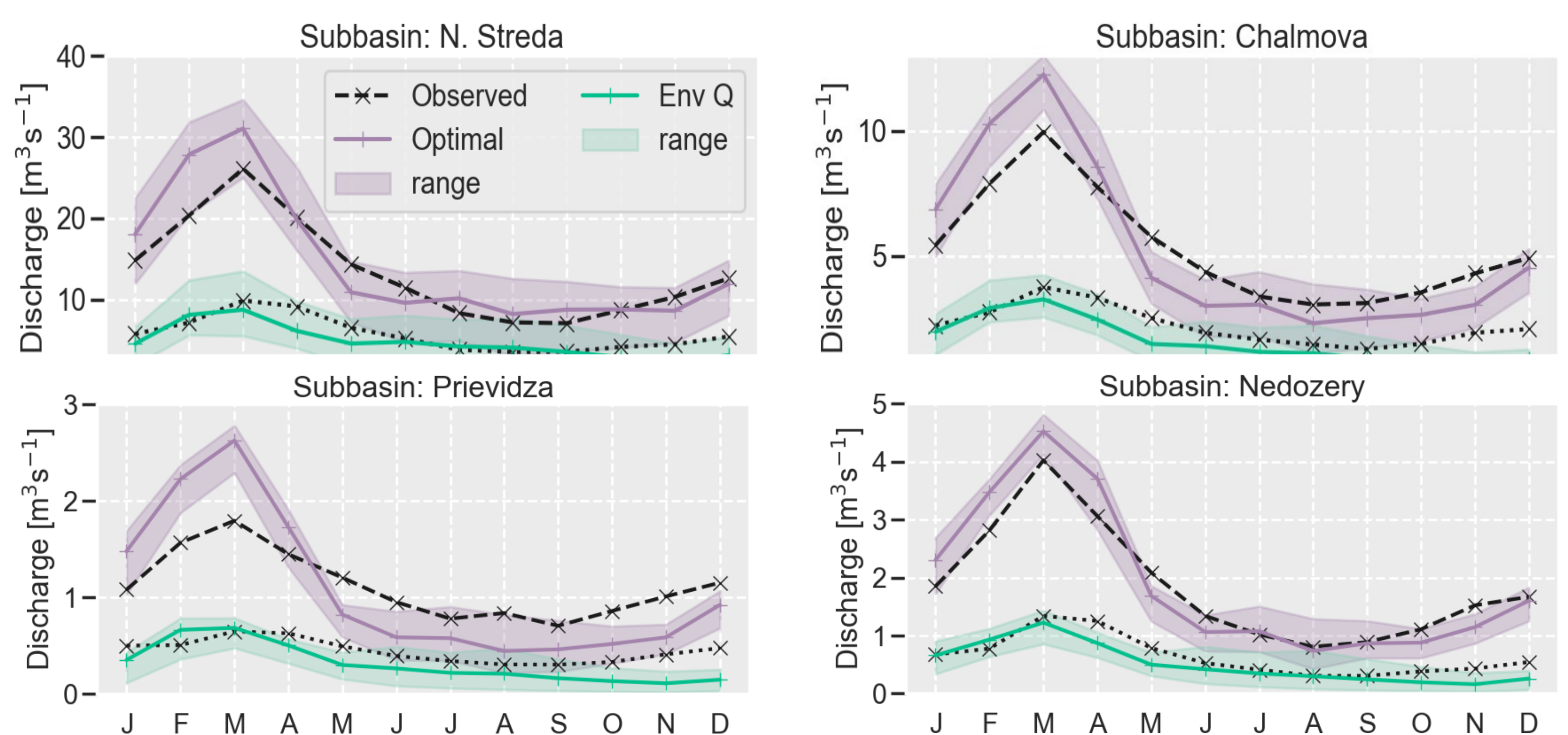
Discharge

The HYPE model:

- semi-distributed &
 - process-based
- (Lindström et al., 2010)

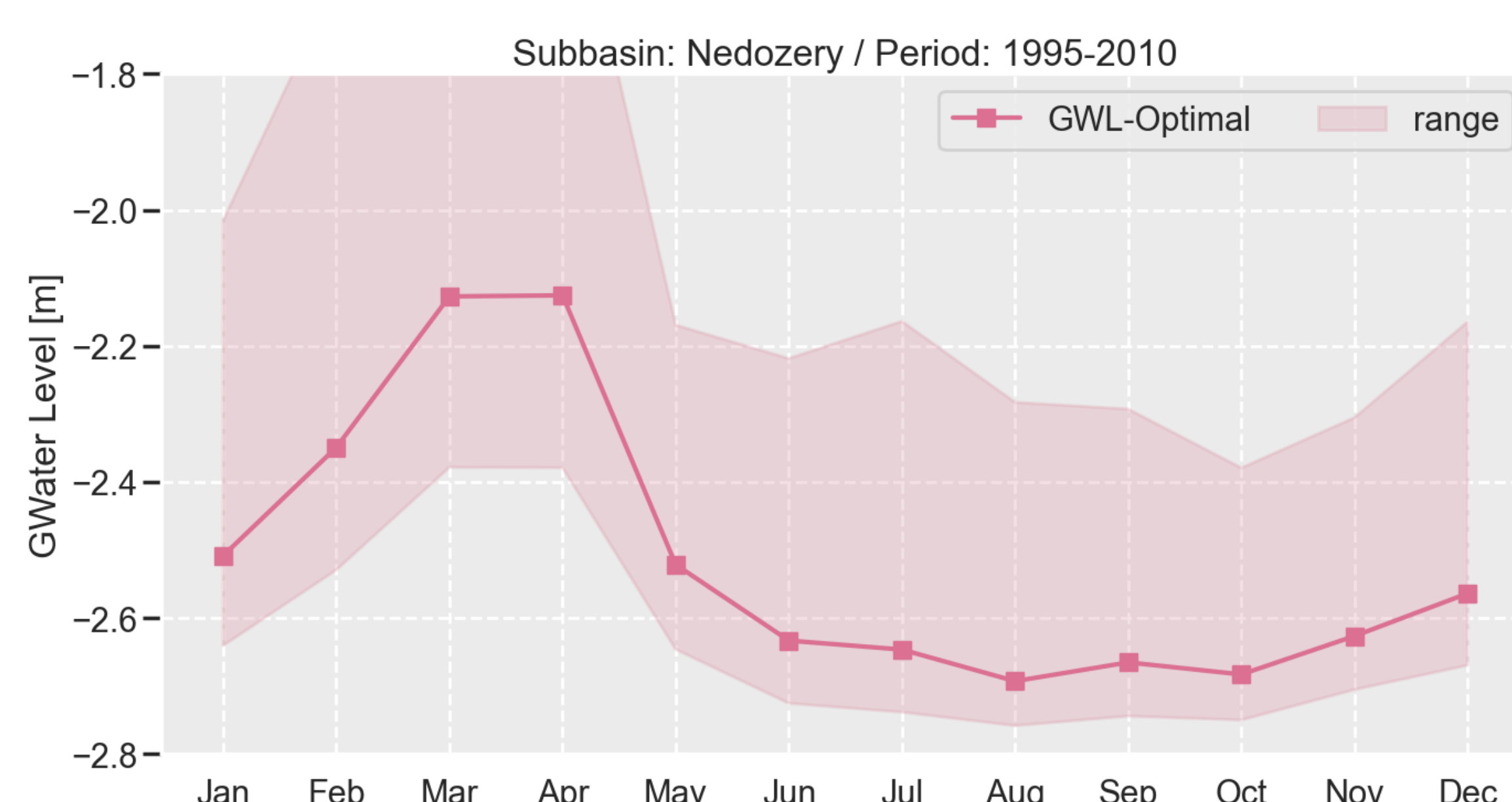
SUBID	Calibration	Validation
4407	0.69	0.75
3972	0.53	0.66
3639	0.73	0.75
3198	0.74	0.71

The Environmental Flows:
Using FDCs (90th percentile)



Env. Flows

Groundwater Levels



Key Messages

1. The HYPE model reasonably well represents the hydrological behaviour.
2. The model simulates the ET well, but slightly underestimates it during peak months.
3. Uncertainty in groundwater levels is larger compared to the other variables.

Results are consistent with previous studies.

REFERENCES:

Lindström, G., Pers, C., Rosberg, J., Strömquist, J., & Arheimer, B. (2010). Development and testing of the HYPE (Hydrological Predictions for the Environment) water quality model for different spatial scales. *Hydrology Research*, 41(3–4), 295–319. <https://doi.org/10.2166/nh.2010.007>
Miralles, D. G., Holmes, T. R. H., De Jeu, R. A. M., Gash, J. H., Meesters, A. G. C. A., & Dolman, A. J. (2011). Global land-surface evaporation estimated from satellite-based observations. *Hydrology and Earth System Sciences*, 15(2), 453–469. <https://doi.org/10.5194/hess-15-453-2011>



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