

Available performance criteria

Performance criteria that can be chosen as objective function for calibration in [info.txt](#). The criteria are calculated for the model domain, based on performances at individual subbasins where observations exist. Three kinds of combination of the individual subbasins are used:

- **average/median:** criteria calculated in subbasins individually, and then combined (equal weight to each station, irrespective of time series length)
- **regional:** criteria calculated on a combined long time series over all subbasins (thus weighted by data lengths)
- **spatial:** time series at each subbasin is collapsed to a single long-term average, these averages are then combined to a “spatial series” over all subbasins, and the criteria calculated over those

Available performance criteria for domain-wide model evaluation are listed in the table below. Equation definitions for criteria calculation are described [here](#).

Note: As described in [info.txt](#), up to 20 performance criteria can be combined for model evaluation. However, for HYPE-internal computational reasons, **criteria TAU, MRA, RRA, and SRA criteria must be defined as one of the first four criteria in info.txt** (e.g. as crit 1 criterion MRA).

Criterion ID	Description	Equation ID
MR2	average of Nash-Sutcliffe efficiency for all subbasins with observations.	AVNSE
MRE	average of the relative bias for all subbasins (Note: fraction, not %).	AVRB
MRA	average value of subbasin values of efficiency (RA) similar to Nash-Sutcliffe with coefficient a instead of a square.	AVRA
MCC	Pearson correlation coefficient, average of all subbasins with observations.	AVCC
MRS	error in standard deviation, average of all subbasins with observations.	AVRSB
MAR	average of absolute relative bias for all subbasins (Note: fraction, not %).	AVARB
MNW	average of Nash-Sutcliffe efficiency adjusted for bias for all subbasins with observations.	AVNSEW
AKG	average of Kling-Gupta efficiency for all subbasins with observations.	AVKGE
RR2	regional Nash-Sutcliffe efficiency (all data combined in one long time series).	REGNSE
RRE	regional relative bias (all data combined in one long time series).	REGRB
RRA	regional efficiency similar to Nash-Sutcliffe with coefficient a instead of a square.	REGRA
MD2	median of Nash-Sutcliffe efficiency for all subbasins with observations.	MEDNSE
MDA	median of all subbasins' RA (efficiency similar to Nash-Sutcliffe with coefficient a instead of a square).	MEDRA
MKG	median of all subbasins' Kling-Gupta efficiency.	MEDKGE
MNR	median of all subbasins' normalised RMSE.	MEDNE
SR2	spatial Nash-Sutcliffe efficiency calculated using annual means for all subbasins (requires at least 5 years and 5 subbasins with data) to calculate the Nash-Sutcliffe efficiency.	SPATNSE
SRA	Spatial efficiency similar to Nash-Sutcliffe with coefficient a instead of a square.	SPATRA

Criterion ID	Description	Equation ID
TAU	average of Kendall's rank correlation coefficient (Tau) value for all subbasins.	<i>AVTAU</i>