Overview of the "*meat*" in our recent paper on the split-sample approach

Shen, H., Tolson, B. A., & Mai, J.(2022).
Time to update the split-sample approach in hydrological model calibration.
Water Resources Research, 58, e2021WR031523.
https://doi.org/10.1029/2021WR031523

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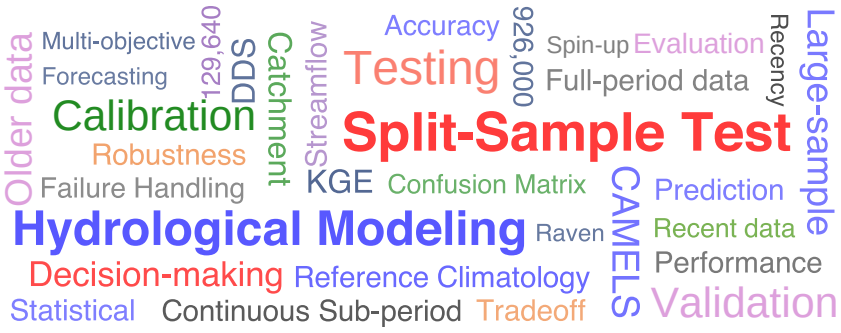
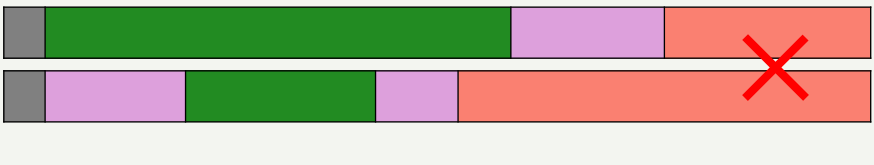


Two Recommendations for Modelers

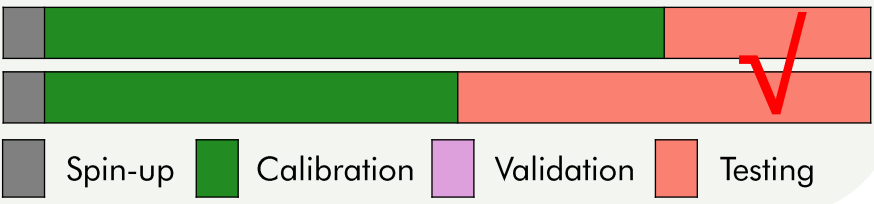
1. Calibrating to the **older data** while validating to the **newer data**, an incredibly common approach used for decades, is **inferior** and **should be avoided**!

e.g.,



2. Calibrating to full-period available data and **skipping temporal validation entirely** is the **most robust** choice.

e.g.,



Two questions addressed in this study

- Can we design a **post-validation** SST assessment framework that includes **a third period** independent of calibration and validation?
- Is it optimal to **skip model temporal validation entirely**, and utilize all available data for model calibration?

Nearly one million split-sample experiments

- 463 CAMELS catchments across the US
- 2 hydrological models
- 50 different calibration sub-periods
- 20 independent trials of model calibration
- 14 independent testing scenarios

Novel assessments on the massive results

- Model building decisions are framed as a **decision tree problem**
- We assess the key model building goal that calibration/validation should function to **correctly classify a model as a success or failure** in the model testing period (relying on a confusion matrix analysis)

Find out more details in our paper:
https://doi.org/10.1029/2021WR031523