

Time series data in target basin(s)

Meteorological forcing
for model simulation

Streamflow data for
model OFs calculation

Parameter selection

15 parameters for each
basin

Initial sampling (iter-0)

LHS parameter sets
(e.g., 400)

Model
simulation

Calculate OFs
(iteration-0)

Iterative optimization (iter-X)

Emulator inputs

Model
parameter sets

Basin
geo-attributes

Model OFs

Emulator training and calibration

Emulator training
(e.g., GPR, RF)

Parameter calibration
(e.g., GA, NSGA)

New parameter sets
(e.g., 100)

Model
simulation

Calculate OFs
(iteration-X)

Select the final parameter set

Final optimized
parameter set

Selection criteria (e.g.,
top metric or Pareto
rank)

Add to inputs from
previous iterations

Yes

Satisfy
criteria?

No