airGRteaching

How an interactive visualization tool can help students evaluate the performance of a hydrological model and understand the role of its parameters

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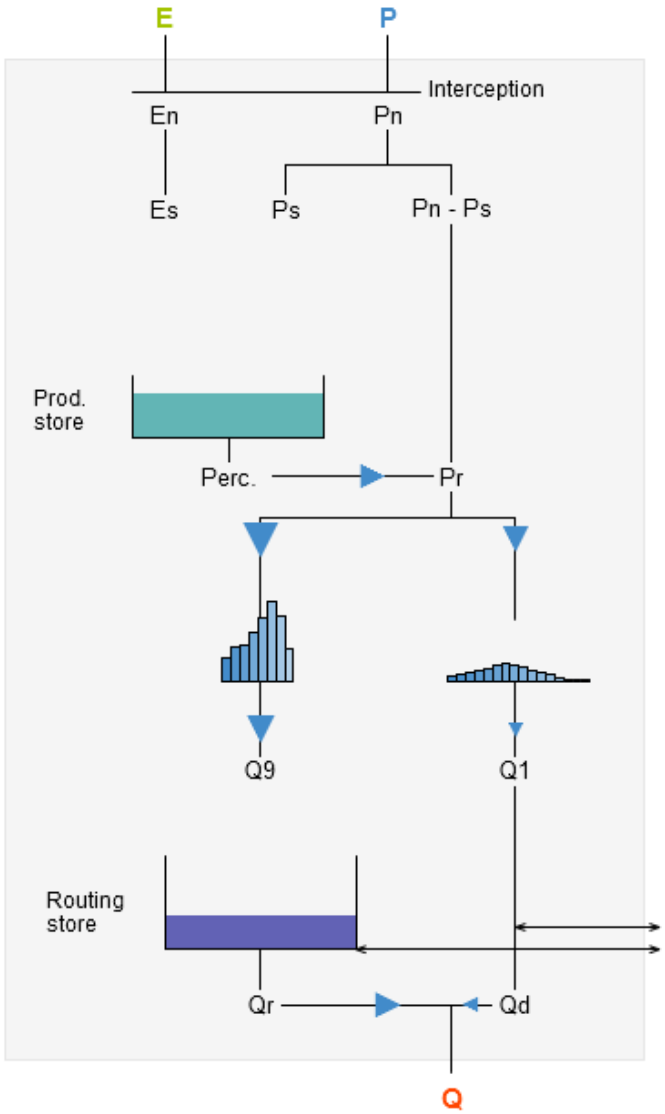
Based on the airGR R-package:

- 3 daily models up to now (including GR4J)



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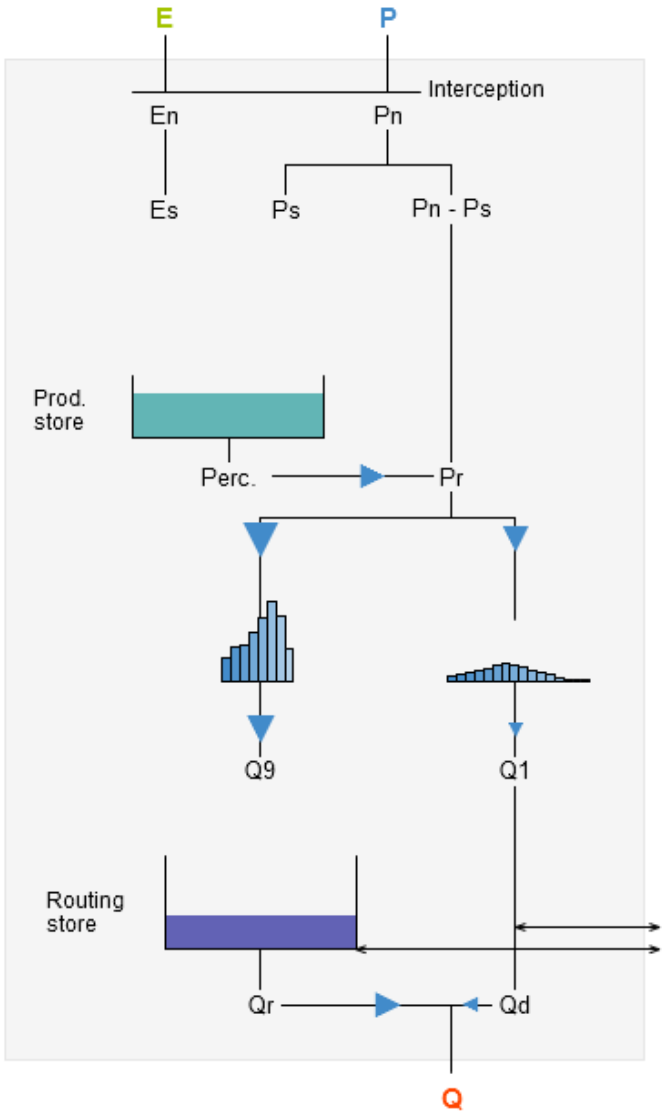
Basic level of programming required

Only 3 simple functions for a full modelling exercise

- Preparation of data
- Model calibration
- Model simulation



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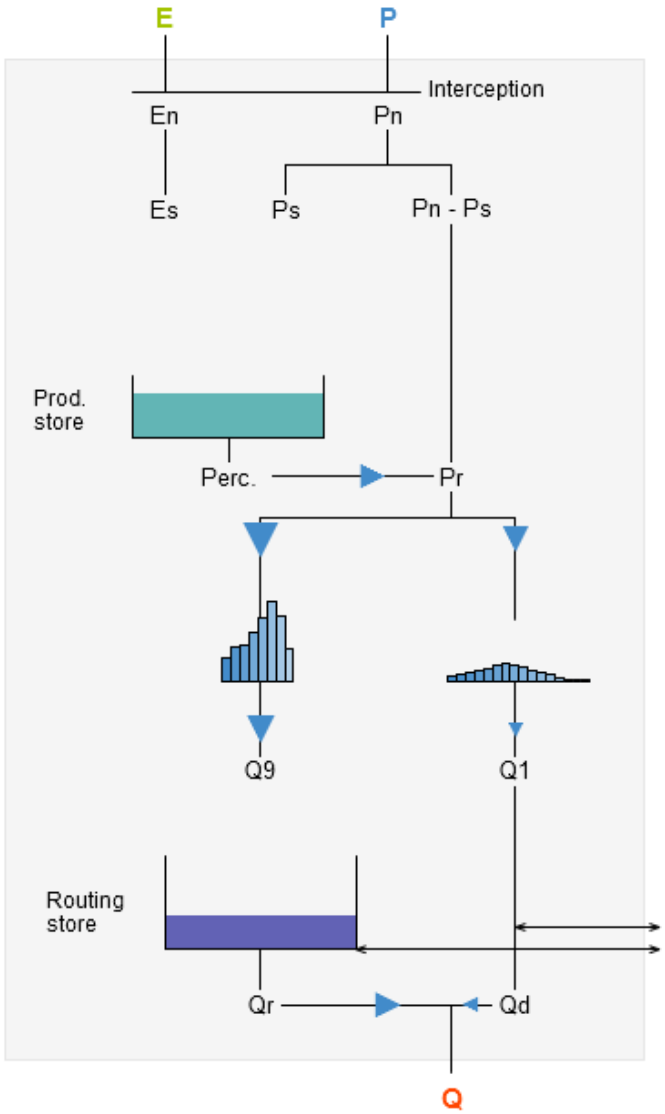
Pre-defined graphical plots

- Mouse events and interactive graphics



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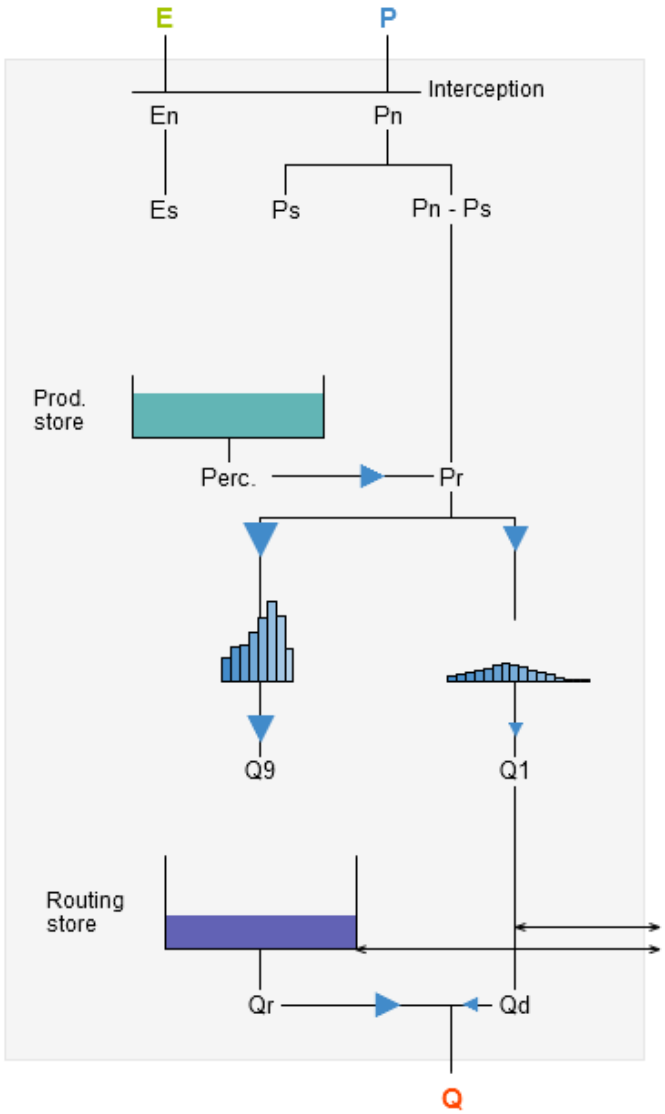
Graphical interface based on a Shiny interface

- Interactive flow simulation with parameters modifications
- Automatic calibration
- Internal variables evolution
- Time period selection



airGRteaching – Shiny interface

Choose a dataset:

Low-land basin

Choose a model:

Hydrological model: GR4J

Snow model: None

Parameters values:

X1 (production store capacity): 250 [mm] (2,500 [mm])

X2 (intercatchment exchange coeff.): -5 [mm/d] | 0.94 [mm/d] | 5 [mm/d]

X3 (routing store capacity): 77 [mm] (1,000 [mm])

X4 (unit hydrograph time constant): 0.5 [d] | 2.2 [d] | 10 [d]

Automatic calibration:

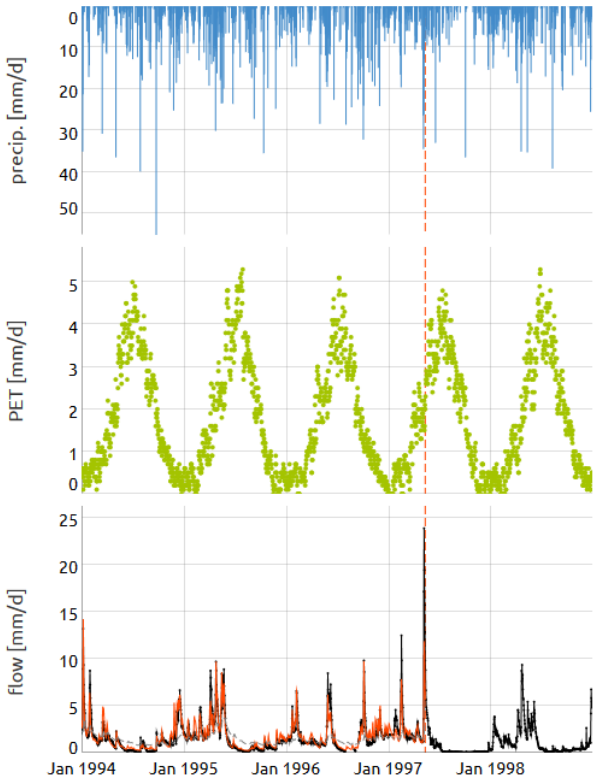
Objective function: NSE [Q]

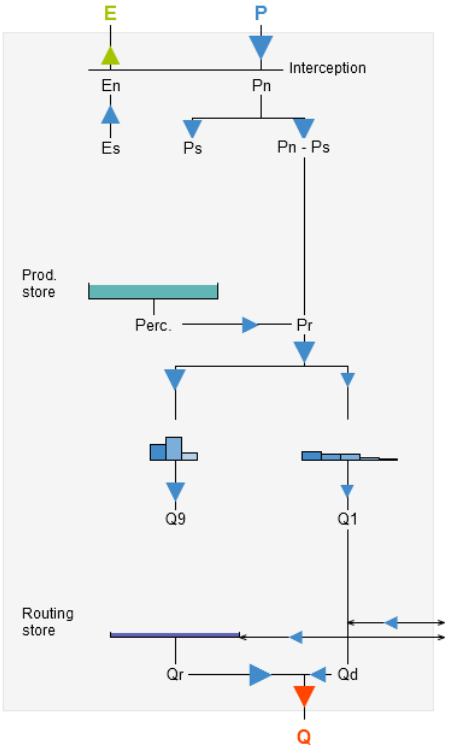
✔ Model calibrated

Choose a plot: Model diagram

Select the time window: 1994-01-01 – 1998-12-31

Select the target date: 1994-01-02 | 1997-05-13 | 1998-12-31





Criterion	Qsim	Qold
NSE [Q]	0.81	0.28
NSE [sqrt(Q)]	0.85	0.40
NSE [1/Q]	0.39	-0.08
KGE [Q]	0.78	0.20
KGE [sqrt(Q)]	0.82	0.32
KGE [1/Q]	0.15	-0.21

Show previous simulation (Qold): ○ No ◉ Yes

Download sim. as csv