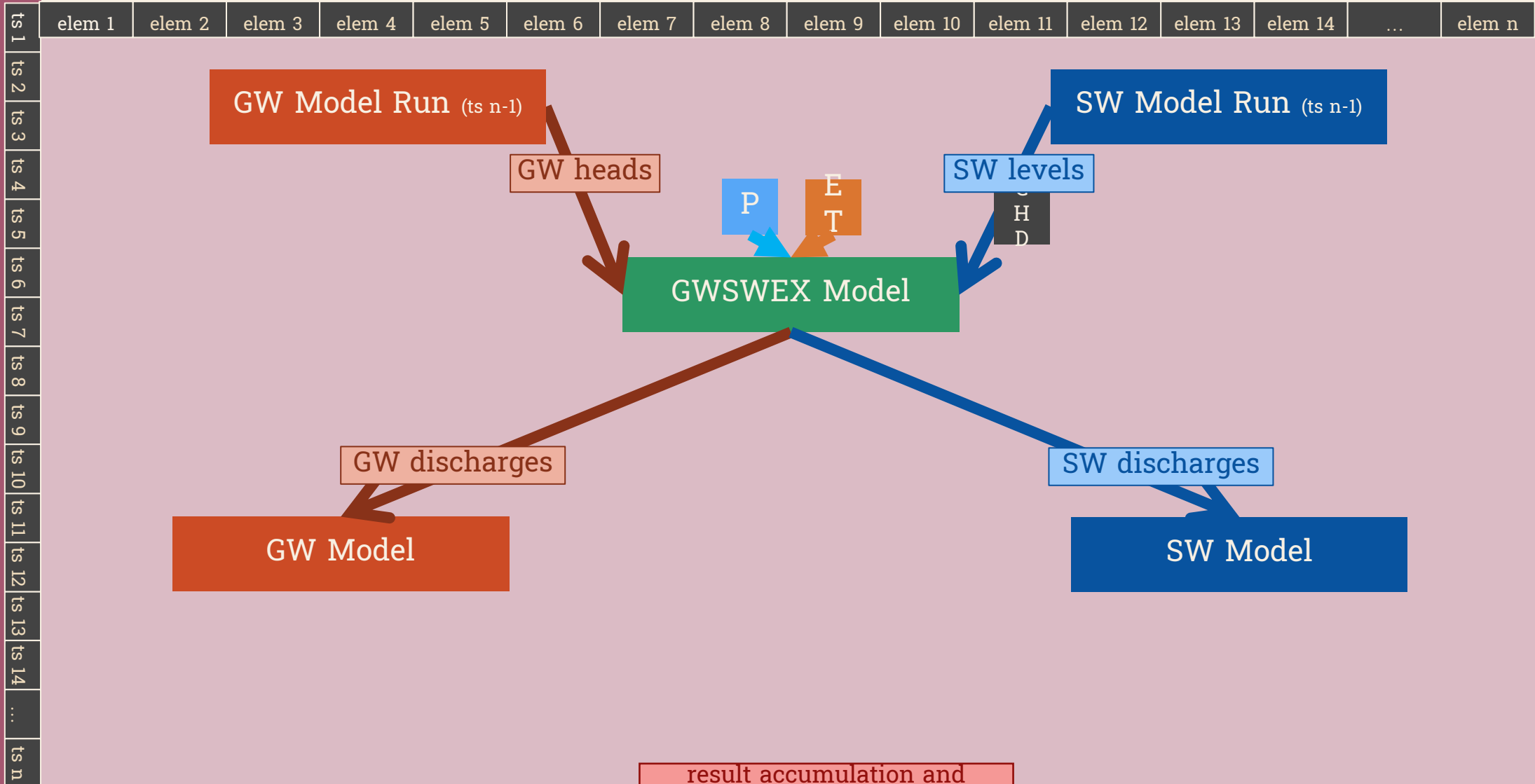


Global Simulation Period

timing
control

ts 1	ts 2	ts 3	ts 4	ts 5	ts 6	ts 7	ts 8	ts 9	ts 10	ts 11	ts 12	ts 13	ts 14	...	ts n
------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-----	------

Local
Simulation
Period



Global Simulation Period

timing
control

ts 1

ts 2

ts 3

ts 4

ts 5

ts 6

ts 7

ts 8

ts 9

ts 10

ts 11

ts 12

ts 13

ts 14

...

ts n

ts 1

ts 2

ts 3

ts 4

ts 5

ts 6

ts 7

ts 8

ts 9

ts 10

ts 11

ts 12

ts 13

ts 14

...

ts n

elem 1

elem 2

elem 3

elem 4

elem 5

elem 6

elem 7

elem 8

elem 9

elem 10

elem 11

elem 12

elem 13

elem 14

...

elem n

GW Model Run (ts n-1)

SW Model Run (ts n-1)

GW heads

SW levels

P

E
T

C
H
D

GWSWEX Model

GW discharges

SW discharges

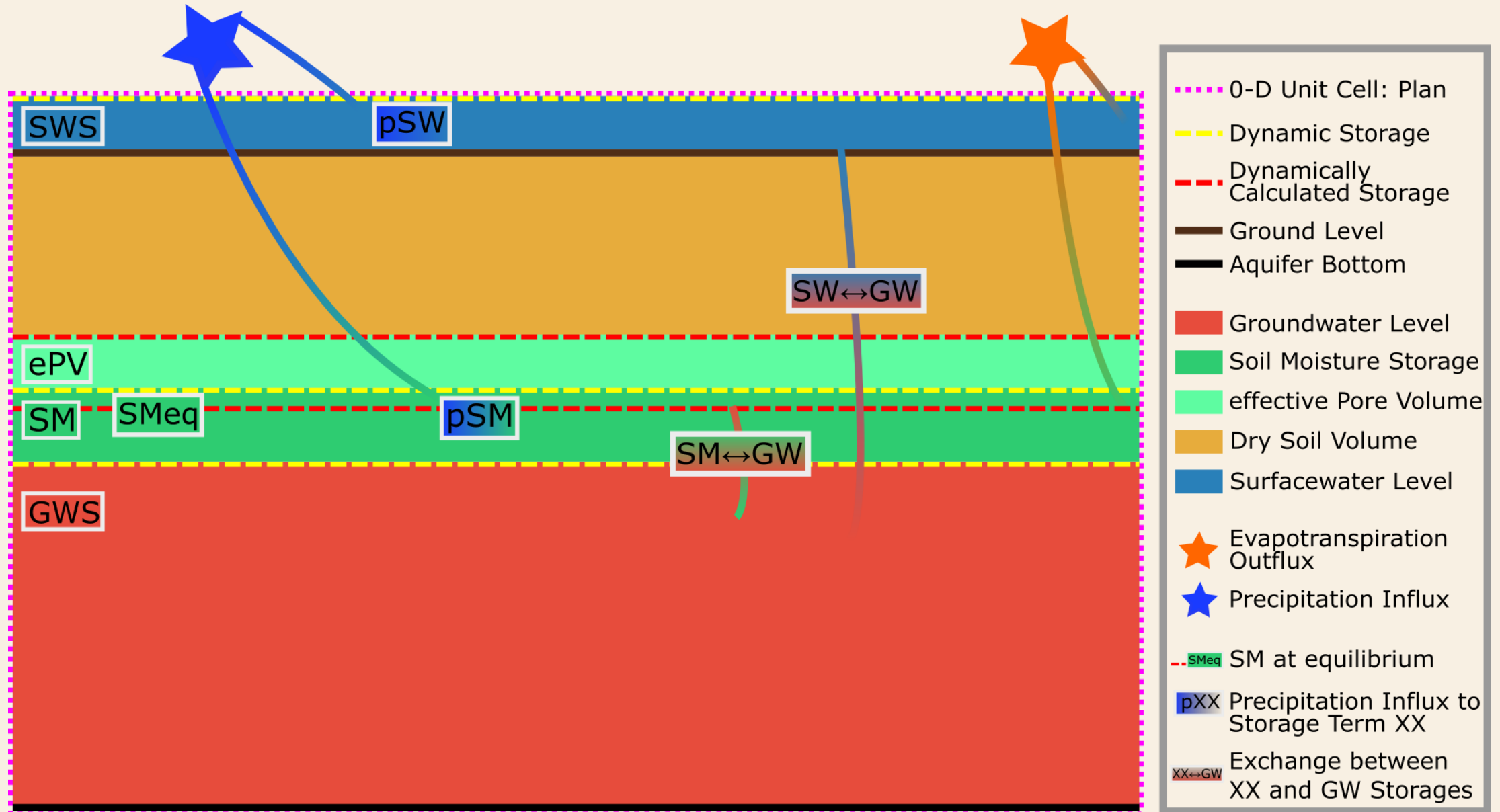
GW Model

SW Model

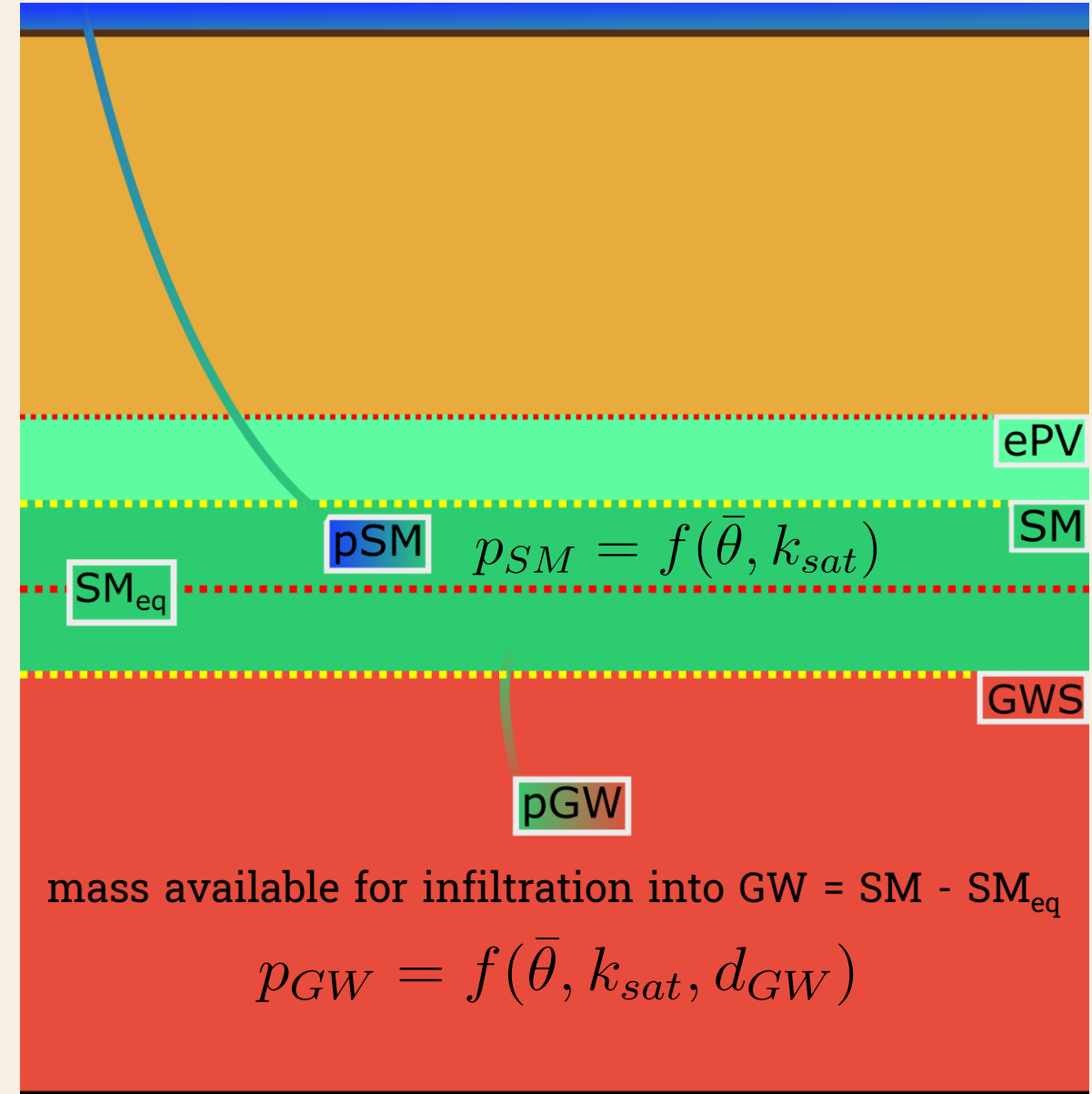
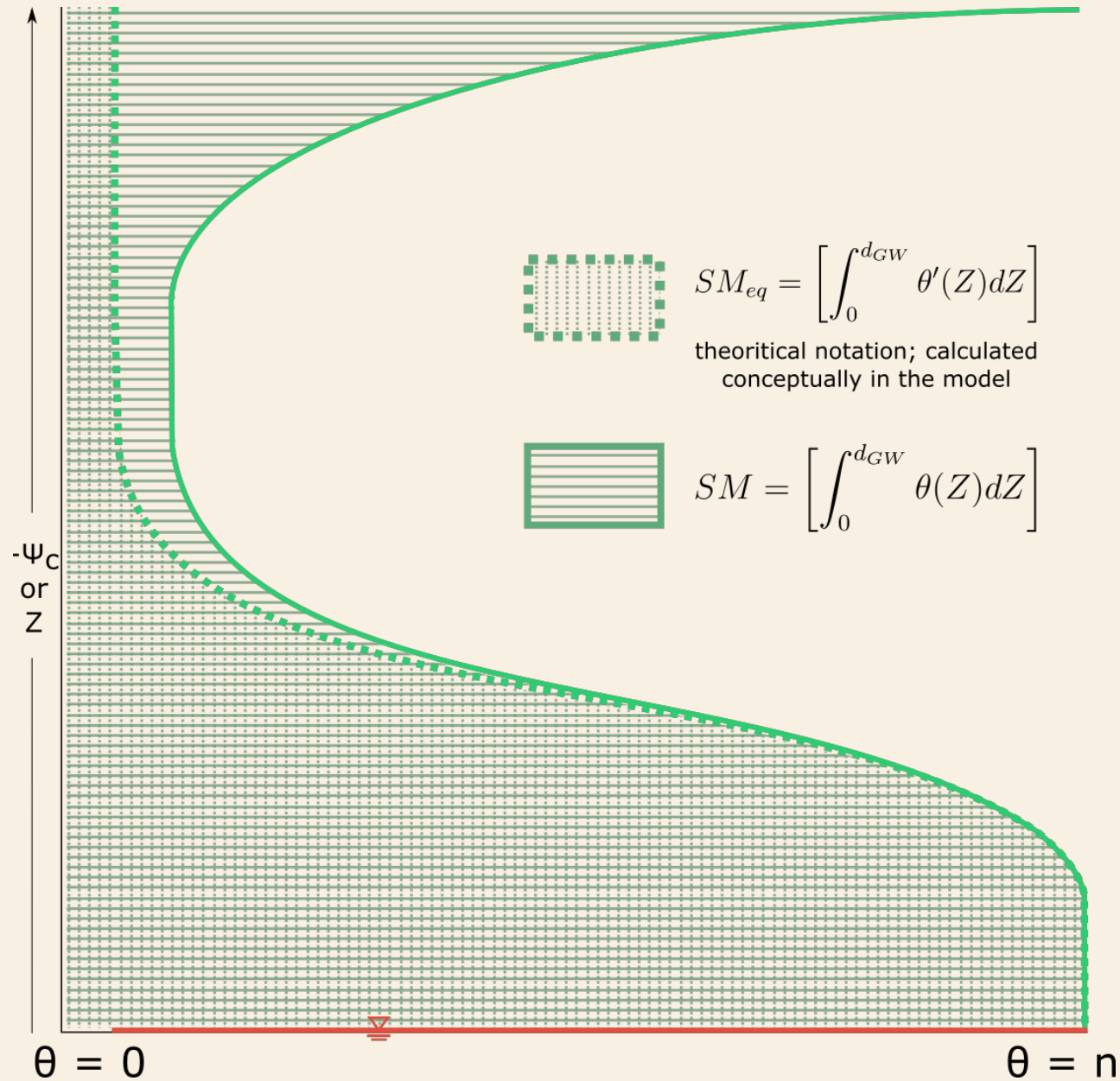
result accumulation and
output

Local
Simulation
Period

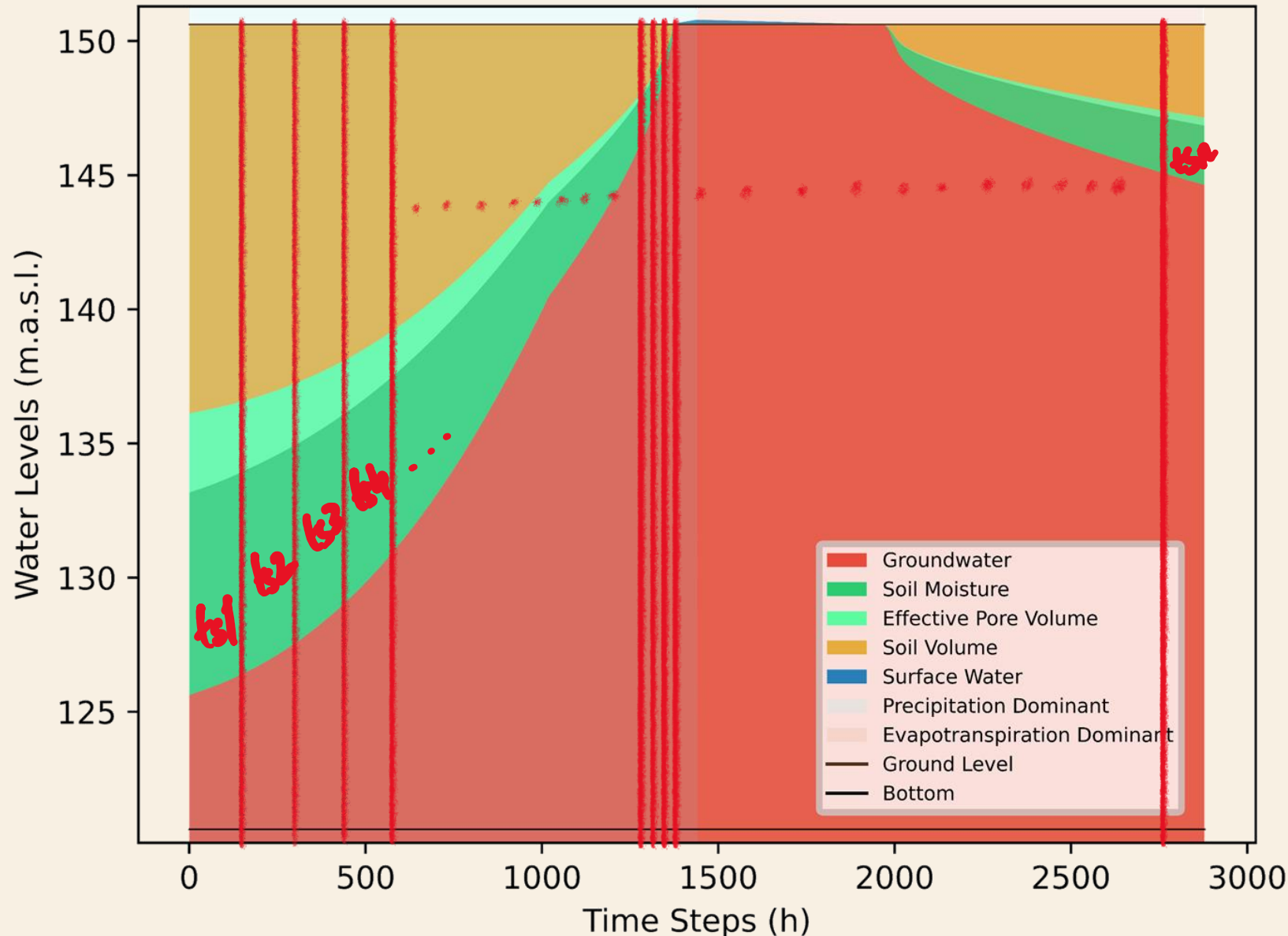
Illustration of the exchange processes per model element: GWSWEX



Model Physics: conceptualizing the Van Genuchten^[10] – Mualem Model^[11]



Model Behaviour: Sample model element



- Buildable as a standalone Fortran 90 program or as a python importable Fortran module (f2py)
- Average **execution time** for a model with *10,000 model elements*, and *3,000 time-steps* is **~36 min** with logging
- Average **execution time** for a model with *10,000 model elements*, and *3,000 time-steps* is **~29 s** with logging

