Test cases Swap

by: J.G. Kroes, J.C. van Dam, P. Groenendijk, R.F.A. Hendriks, F. van den Berg

12 juni 2017

Swap 4.0.1

Inhoudsopgave

1 Introduction

This document describes test-results of simulations with the SWAP model.

In the first chapter summaries are given in 4 tables:
1. overall performance: i) was the simulation succesfull completed, ii) was the water balance sound, iii) what was the required cpu time;
2. performance indicator 1 (PI1): in general the cumulative flux at 1 meter depth;
3. performance indicator 1 (PI2);
4. performance indicator 1 (PI3);

In the next chapters the following is reported of each case :
1. a table with a short characterisation;
2. a table with the numerical input settings;
3. a table with the results from the 3 Performace Indicators;
4. a figure with 3 pictures corresponding to the 3 performance indicators;
5. a yearly water balance of each simulated year; mass balance of water (and when relevant of solutes), if the nr of years is high then the table may be truncated.

NOTE: the tests with Macropores produce a waterbalans with a deviation that is equal to the rapid drainage.
This is due to an imcomplete postprocessing and NOT due to incorrect water balance simulations
Please verify files with extension *.blc and *.bma for detailed water balances

2 Summary

The cases were simulated using:
Swap 4.0.1

Tabel 1: System info

	systeminfo
sysname	Windows
release	7 x64
version	build 7601, Service Pack 1
nodename	L0142780
machine	x86-64
login	kroes006
user	kroes006
effective_user	kroes006

Tabel 2: Summary of results

	case	completed	watbalok	cpu.sec
1	AnalyticSoilPressurehead	yes	yes	4.60
2	AnalyticSoilTemperature	yes	yes	1.68
3	AnalyticSolute	yes	yes	5.87
4	AnimoForageMaize(Cranendonk)	yes	yes	4.88
5	AnimoGrassland(Cranendonk)	yes	yes	3.90
6	AnimoGrassland(Ruurlo)	yes	yes	2.74
7	DrainageBasic(EuroHarpDKO)	yes	yes	6.38
8	DrainageBasic(Hupsel)	yes	yes	2.32
9	DrainageExtended(STONE2uc6)	yes	yes	6.68
10	DrainageExtended(Timing)	yes	yes	1.08
11	DrainageExtended(Wildenborch)	yes	yes	4.14
12	GwlMeasuredasbottomBC(Ruurlo)	yes	yes	2.74
13	GwlShallow(Zegveld)	yes	yes	20.83
14	Hysterese(Hupsel)	yes	yes	2.11
15	InfiltrationRunoff(VanDamFeddes2000)	yes	yes	1.03
16	Interception(Speuld)	yes	yes	4.11
17	Interflow(Vlietpolder)	yes	yes	3.96
18	IrrigationScheduledFixedTiming(Sevilla)	yes	yes	15.13
19	MacroPores1	yes	no	76.36
20	MacroPores2	yes	yes	7.34
21	MeteoDetailedInOut(Hupsel)	yes	yes	2.12
22	MeteoPrecipitationDetail(Andelst)	yes	yes	4.40
23	PearlDrainageBasic	yes	yes	1.56
24	PearlFocus1(Joki-m)	yes	yes	22.64
25	PearlFocus2(Okeh-m)	yes	yes	30.06
26	PearlFocus3(Port-m)	yes	yes	28.29
27	PearlFocus4(Sevi-m)	yes	yes	29.75
28	PearlLysimeter	yes	yes	1.71
29	ShallowSoil(EuroHarpITE)	yes	yes	4.32
30	SnowFrost(Boreas)	yes	yes	1.90
31	SnowFrost(EuroHarpNOV)	yes	yes	9.27
32	SoilEvaporation(Castricum)	yes	yes	8.34
33	TimingErrorEndofDay	yes	yes	2.51
34	TranspirationDecForest(Castricum)	yes	yes	10.59
35	TranspirationPineForest(Castricum)	yes	yes	10.47
36	total	35	34	345.81

Tabel 3: Performance Indices 1

	PIname	PIunit	SIM	OBS	ME	RMSE
1	RMSE-loam-sand	cm	-26.20	-26.23	-0.02	0.04
2	RMSE-depth0.45cm	oC	20.00	20.00	-0.00	0.17
3	RMSE-Ldis0.1cm	g/cm3	2.45	2.17	-0.28	2.66
4	qCum-1m	mm	2111.51			
5	qCum-1m	mm	1375.89			
6	qCum-1m	mm	1010.34			
7	qCum-1m	mm	4870.46			
8	qCum-1m	mm	557.29			
9	qCum-1m	mm	4397.31			
10	qCum-1m	mm	699.17			
11	RMSE-GrndWatlev	m bss	-0.64	-0.58	-0.05	0.13
12	qCum-1m	mm	1020.36			
13	qCum-1m	mm	721.51			
14	qCum-1m	mm	565.55			
15	qCum-1m	mm	0.13			
16	qCum-1m	mm	570.09			
17	qCum-1m	mm	110.62			
18	qCum-1m	mm	8314.03			
19	qCum-1m	mm	60.24			
20	qCum-1m	mm	-4.87			
21	qCumDiff-1m	mm	15.85	128.38	0.12	0.36
22	qCum-1m	mm	385.30			
23	qCum-1m	mm	323.91			
24	qCum-1m	mm	13927.60			
25	qCum-1m	mm	27067.35			
26	qCum-1m	mm	41813.27			
27	qCum-1m	mm	13289.98			
28	qCum-cmp1	mm	1179.92			
29	qCum-1m	mm	1447.37			
30	qCum-1m	mm	23.32			
31	qCum-1m	mm	1246.56			
32	qCum-1m	mm	18445.31			
33	qCum-1m	mm	1077.00			
34	qCum-1m	mm	10867.49			
35	qCum-1m	mm	8944.58			

Tabel 4: Performance Indices 2

	PIname	PIunit	SIM	OBS	ME	RMSE
1	RMSE-sand-loam	cm	-31.48	-31.11	0.37	2.57
2	RMSE-depth245.0cm	oC	19.93	20.00	-0.07	0.07
3	RMSE-Ldis1.0cm	g/cm3	2.00	2.00	0.00	0.07
4	qCum-EvapCrop	mm	2476.00			
5	qCum-EvapCrop	mm	4039.00			
6	qCum-EvapCrop	mm	1826.00			
7	qCum-EvapCrop	mm	2677.00			
8	qCum-EvapCrop	mm	963.00			
9	qCum-EvapCrop	mm	4033.00			
10	qCum-EvapCrop	mm	278.00			
11	RMSE-SurfWatLev	m bss	-0.74	-0.83		0.16
12	qCum-EvapCrop	mm	1882.00			
13	qCumDiff-RainIO	mm	9398.30	9398.30	0.00	
14	qCum-EvapCrop	mm	935.00			
15	qCum-cmp1	mm	924.20			
16	RMSE-throughfall	mm	774.45	768.07	6.39	24.13
17	qCumDiff-RainIO	mm	3310.10	3310.10	0.00	
18	qCumDiff-IrrigIO	mm	21223.58	54587.20	-33363.62	
19	gwl-ave	cm bss	-107.66			
20	gwl-ave	cm bss	-94.31			
21	qCumDiff-Esoil	mm	36.89	420.26	-0.13	1.52
22	qCumDiff-RainIO	mm	1394.70	1395.35	-0.65	
23	qCum-EvapCrop	mm	233.00			
24	qCum-EvapCrop	mm	14263.00			
25	qCum-EvapCrop	mm	25366.00			
26	qCum-EvapCrop	mm	29856.00			
27	qCumDiff-IrrigIO	mm	71994.66	28086.00	43908.66	
28	qCum-EvapCrop	mm	412.00			
29	qCum-EvapCrop	mm	5786.00			
30	RMSE-swe	cm	14.53	21.92	-7.39	9.19
31	qCum-EvapCrop	mm	4494.00			
32	RMSE-qDrain	mm	18599.00	19160.29	-18.71	41.54
33	qCum-Rain	mm	2353.38			
34	RMSE-qDrain	mm	10143.00	11784.00	-54.70	78.40
35	RMSE-qDrain	mm	8309.00	7922.82	12.87	86.11

Tabel 5: Performance Indices 3

	PIname	PIunit	SIM	OBS	ME	RMSE
1	RMSE-clay-sand	cm	-13.73	-13.68	0.05	0.11
2	RMSE-depth492.5cm	oC	19.88	20.00	-0.12	0.13
3	RMSE-Ldis10.0cm	g/cm3	1.95	1.95	0.00	0.02
4	RMSE-gwl	cm	-128.64	-134.48	7.84	19.11
5	RMSE-gwl	cm	-111.30	-99.77	-7.88	14.46
6	RMSE-gwl	cm	-86.14	-104.14	3.35	22.29
7	qCum-bottom	cm	0.00			
8	qCum-bottom	cm	0.00			
9	qCum-bottom	cm	1575.00			
10	qCum-bottom	cm	91.00			
11	qCumDrainOut	mm	-490.00			
12	RMSE-gwl	cm	-94.54	-104.53	0.00	0.00
13	RMSE-RainIO	mm	4387.05	4387.04	0.00	0.00
14	qCum-bottom	cm	0.00			
15	qCum-Runoff	mm	1475.78			
16	RMSE-theta50cm	-	0.16	0.11	0.03	0.04
17	RMSE-RainIO	mm	1658.46	1658.46	0.00	0.00
18	RMSE-IrrigIO	mm	10652.54	10233.89	0.00	0.00
19	qCum-bottom	mm	-86.68			
20	qCum-bottom	mm	7.26			
21	qCumDiff-Ecrop10cm	mm	19.71	219.56	-0.07	0.42
22	RMSE-RainIO	mm	701.32	701.21	0.11	0.58
23	qCum-bottom	cm	-365.00			
24	qCum-bottom	cm	14017.00			
25	qCum-bottom	cm	26575.00			
26	qCum-bottom	cm	41817.00			
27	RMSE-IrrigIO	mm	14212.21	14134.18	0.00	0.00
28	qCum-bottom	cm	582.00			
29	qCum-bottom	cm	0.00			
30	RMSE-tem	oC	9.13	1.59	5.65	10.92
31	qCum-bottom	cm	0.00			
32	RMSE-ETact	mm	6565.00	6087.81	15.91	27.89
33	Count-ErrorDays	-	0.00			
34	RMSE-ETact	mm	15622.00	13464.10	71.93	87.67
35	RMSE-ETact	mm	18096.00	17325.28	25.69	76.83

3 AnalyticSoilPressurehead

Tabel 6: Description of case

	1
CaseNr	1
dirnam	AnalyticSoilPressurehead
Purpose	Verification of SoilwaterPressureHeads
Location	
SimulationPeriod	steadystate (1 a)
SoilType	3 layered profiles
CropType	BareSoil
drainage	none
irrigation	none
bottomboundary	Free drainage
reference	Vanderborght et al (2005)

Project: SteadyStatels
File name: SteadyStatels.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:02 2017
Simulation stopped at Mon Jun 12 11:39:07 2017
Simulation elapsed time 4.6 (sec)

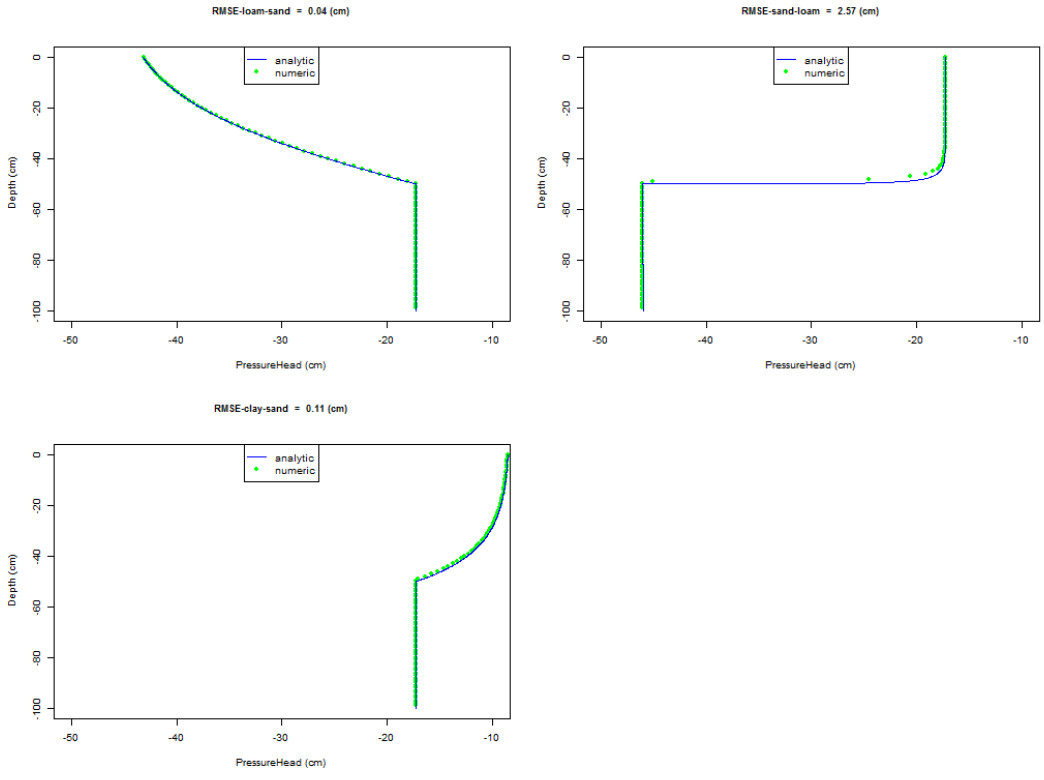
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 7: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 8: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	RMSE-loam-sand	cm	-26.20	-26.23	-0.02	0.04
2	RMSE-sand-loam	cm	-31.48	-31.11	0.37	2.57
3	RMSE-clay-sand	cm	-13.73	-13.68	0.05	0.11



Figuur 1: AnalyticSoilPressurehead

Tabel 9: Waterbalans

	x
ipl	1
yr	1971
Igrai	1825
Igsnow	0
Igirr	0
RunOn	0
fldrin1	0
fldrin2	0
fldrin3	0
flindr4	0
fldrin5	0
flbtin	0
evicpr	0
evicir	0
evso	0
evsubl	0
evpn	0
flev	0
runoff	0
fldrou1	0
fldrou2	0
fldrou3	0
fldrou4	0
fldrou5	0
flbtou	-1730
deltast	-95
deltapn	0
deltasnow	0
badev	0
evsoma	0
evtrma	0

4 AnalyticSoilTemperature

Tabel 10: Description of case

	2
CaseNr	2
dirnam	AnalyticSoilTemperature
Purpose	Verification of SoilTemperatures
Location	
SimulationPeriod	steadystate
SoilType	1 layer profile
CropType	BareSoil
drainage	none
irrigation	none
bottomboundary	Free drainage
reference	-

Project: AnalyticSoilTemp
File name: AnalyticSoilTemp.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:08 2017
Simulation stopped at Mon Jun 12 11:39:10 2017
Simulation elapsed time 1.68 (sec)

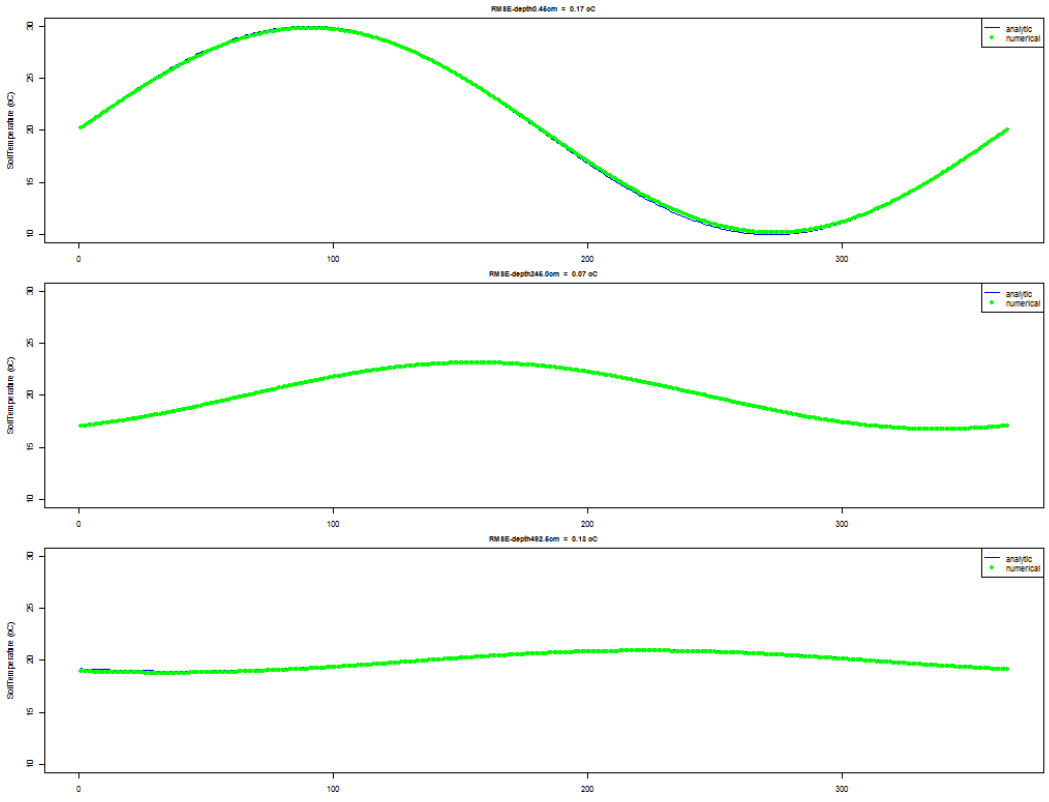
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 11: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 12: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	RMSE-depth0.45cm	oC	20.00	20.00	-0.00	0.17
2	RMSE-depth245.0cm	oC	19.93	20.00	-0.07	0.07
3	RMSE-depth492.5cm	oC	19.88	20.00	-0.12	0.13



Figuur 2: AnalyticSoilTemperature

Tabel 13: Waterbalans

	x
ipl	1
yr	1971
Igrai	0
Igsnow	0
Igirr	0
RunOn	0
fldrin1	0
fldrin2	0
fldrin3	0
flindr4	0
fldrin5	0
flbtin	0
evicpr	0
evicir	0
evso	0
evsubl	0
evpn	0
flev	0
runoff	0
fldrou1	0
fldrou2	0
fldrou3	0
fldrou4	0
fldrou5	0
flbtou	0
deltast	0
deltapn	0
deltasnow	0
badev	0
evsoma	0
evtrma	0

5 AnalyticSolute

Tabel 14: Description of case

	3
CaseNr	3
dirnam	AnalyticSolute
Purpose	Solute transport processes
Location	
SimulationPeriod	steadystate
SoilType	1 layer profile
CropType	BareSoil
drainage	none
irrigation	yes
bottomboundary	Free drainage
reference	Jury W.A. and K. Roth (1990)

Project: solute1
File name: solute1.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:11 2017
Simulation stopped at Mon Jun 12 11:39:17 2017
Simulation elapsed time 5.87 (sec)

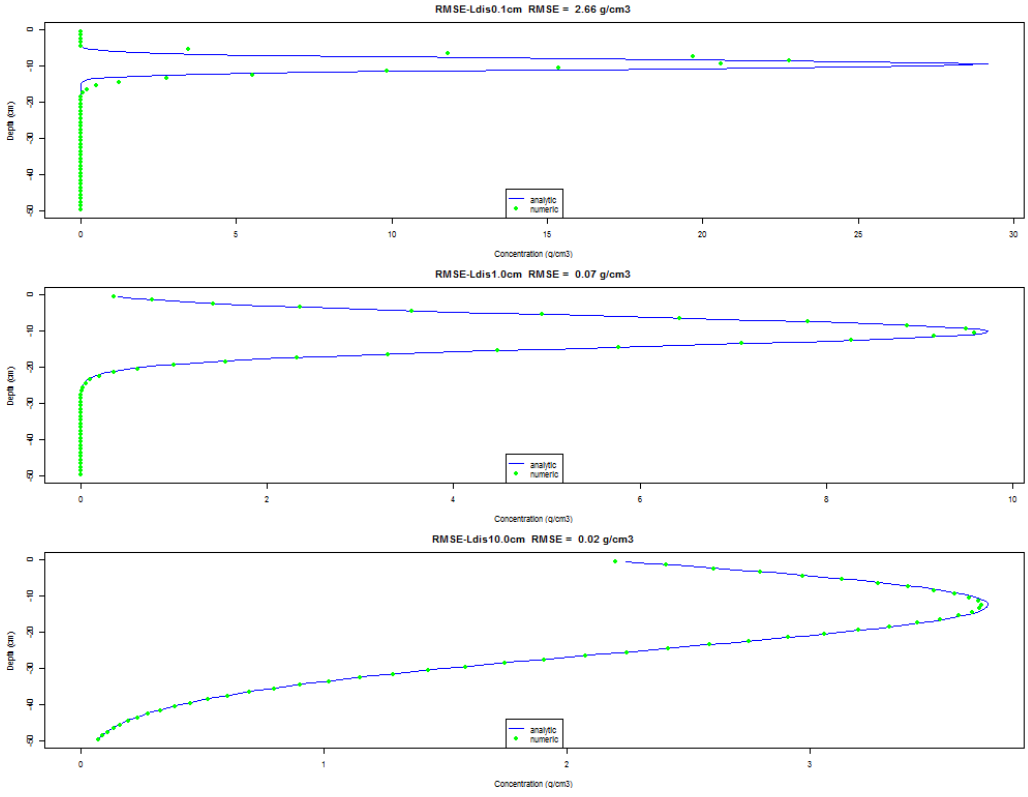
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 15: Iteration parameters

	variables	values	units
1	DTMIN	1e-04	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 16: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	RMSE-Ldis0.1cm	g/cm3	2.45	2.17	-0.28	2.66
2	RMSE-Ldis1.0cm	g/cm3	2.00	2.00	0.00	0.07
3	RMSE-Ldis10.0cm	g/cm3	1.95	1.95	0.00	0.02



Figuur 3: AnalyticSolute

Tabel 17: Waterbalans

	x
ipl	1
yr	1971
Igrai	364
Igsnow	0
Igirr	1
RunOn	0
fldrin1	0
fldrin2	0
fldrin3	0
flindr4	0
fldrin5	0
flbtin	0
evicpr	0
evicir	0
evso	0
evsubl	0
evpn	0
flev	0
runoff	0
fldrou1	0
fldrou2	0
fldrou3	0
fldrou4	0
fldrou5	0
flbtou	-364
deltast	-1
deltapn	0
deltasnow	0
badev	0
evsoma	0
evtrma	0

6 AnimoForageMaize(Cranendonk)

Tabel 18: Description of case

	4
CaseNr	4
dirnam	AnimoForageMaize(Cranendonk)
Purpose	waterbalans terms distribution
Location	Cranendonck-NL
SimulationPeriod	1974-1982
SoilType	2 layers
CropType	MaizeS
drainage	none
irrigation	none
bottomboundary	hydraulic head of deep aquifer
reference	Kroes et al ()

Project: Cranmais
File name: Cranmais.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:22 2017
Simulation stopped at Mon Jun 12 11:39:27 2017
Simulation elapsed time 4.88 (sec)

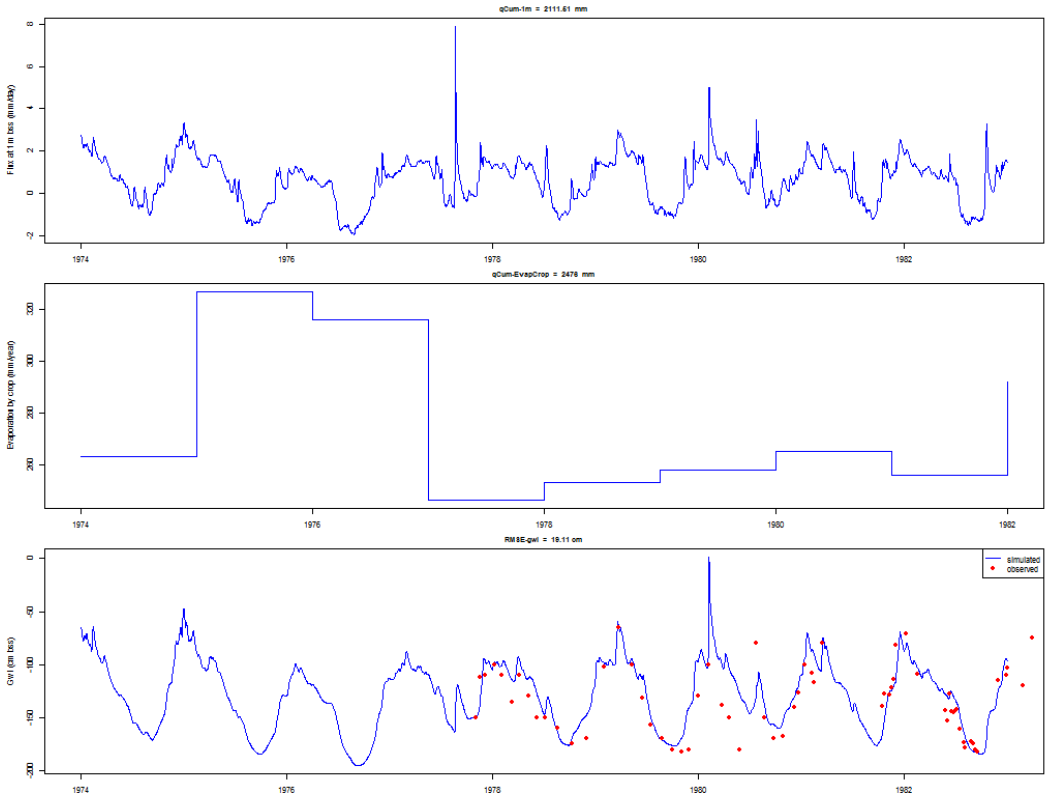
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 19: Iteration parameters

	variables	values	units
1	DTMIN	1e-07	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 20: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	2111.51			
2	qCum-EvapCrop	mm	2476.00			
3	RMSE-gwl	cm	-128.64	-134.48	7.84	19.11



Figuur 4: AnimoForageMaize(Cranendonk)

Tabel 21: Waterbalans

	1	2	3	4	5	6	7	8	9
ipl	1	1	1	1	1	1	1	1	1
yr	1974	1975	1976	1977	1978	1979	1980	1981	1982
Igrai	822	590	492	809	615	727	792	811	645
Igsnow	0	0	0	0	0	0	0	0	0
Igirr	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0
flbtin	30	112	170	6	67	84	14	43	82
evicpr	-52	-30	-31	-36	-35	-35	-44	-43	-45
evicir	0	0	0	0	0	0	0	0	0
evso	-156	-163	-137	-154	-145	-168	-146	-153	-158
evsubl	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0
flev	-263	-327	-316	-246	-253	-258	-265	-256	-292
runoff	0	0	0	-10	0	0	-24	0	0
fldrou1	0	0	0	0	0	0	0	0	0
fldrou2	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0
flbtou	-365	-299	-149	-338	-243	-346	-359	-359	-258
deltast	-16	118	-29	-31	-5	-4	32	-43	26
deltapn	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0
evsoma	-291	-283	-320	-283	-271	-265	-286	-268	-308
evtrma	-263	-328	-357	-247	-253	-258	-266	-256	-293

7 AnimoGrassland(Cranendonk)

Tabel 22: Description of case

	5
CaseNr	5
dirnam	AnimoGrassland(Cranendonk)
Purpose	waterbalans terms distribution
Location	Cranendonck-NL
SimulationPeriod	
SoilType	
CropType	grassland
drainage	
irrigation	
bottomboundary	
reference	Salm et al ()

Project: CranGras
File name: CranGras.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:28 2017
Simulation stopped at Mon Jun 12 11:39:32 2017
Simulation elapsed time 3.9 (sec)

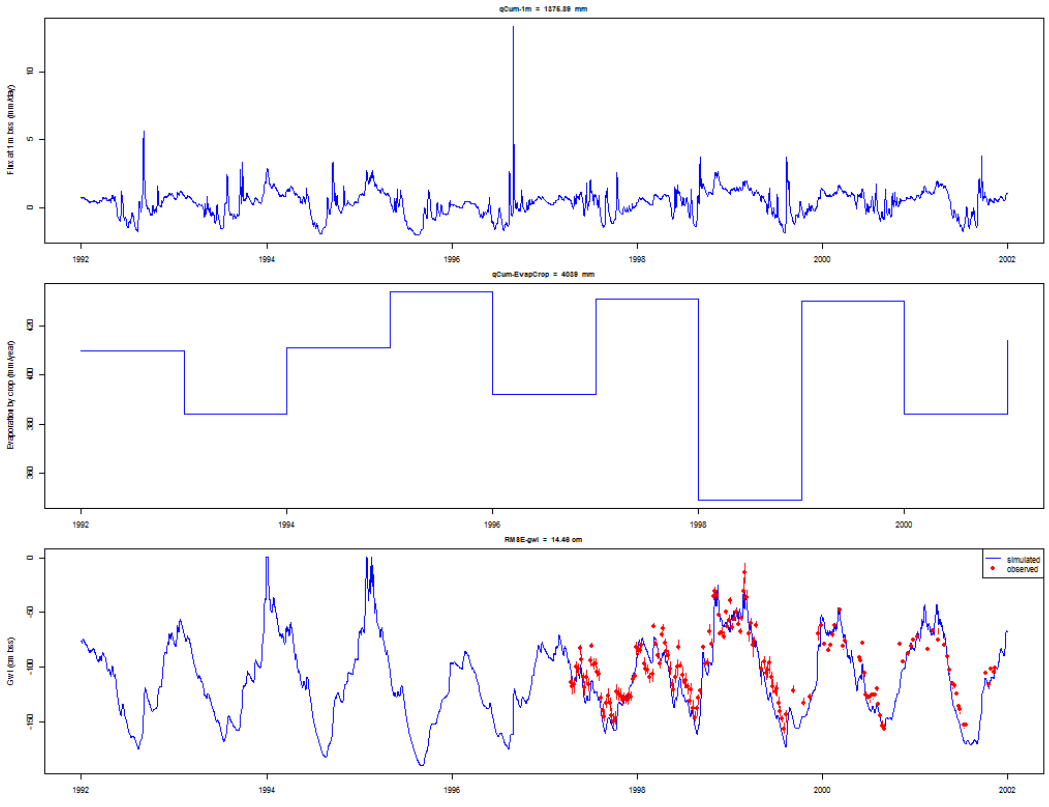
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 23: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 24: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	1375.89			
2	qCum-EvapCrop	mm	4039.00			
3	RMSE-gwl	cm	-111.30	-99.77	-7.88	14.46



Figuur 5: AnimoGrassland(Cranendonk)

Tabel 25: Waterbalans

	1	2	3	4	5	6	7	8	9	10
ipl	1	1	1	1	1	1	1	1	1	1
yr	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Igrai	679	743	743	664	587	692	892	811	774	844
Igsnow	0	0	0	0	0	0	0	0	0	0
Igirr	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0
flbtin	335	317	282	348	384	334	218	288	252	269
evicpr	-81	-85	-87	-85	-73	-80	-106	-95	-102	-104
evicir	0	0	0	0	0	0	0	0	0	0
evso	-83	-70	-81	-71	-77	-89	-71	-83	-78	-79
evsubl	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0
flev	-410	-384	-411	-434	-392	-431	-349	-430	-384	-414
runoff	0	-2	-13	-17	0	0	0	0	0	0
fldrou1	-442	-453	-483	-438	-406	-440	-534	-476	-503	-490
fldrou2	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0
flbtou	0	0	-5	-8	0	0	-11	0	0	0
deltast	2	-59	50	42	-24	13	-38	-15	42	-25
deltapn	0	-7	7	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0
evsoma	-93	-87	-94	-100	-89	-98	-80	-98	-87	-94
evtrma	-410	-384	-413	-441	-392	-431	-350	-433	-384	-414

8 AnimoGrassland(Ruurlo)

Tabel 26: Description of case

	6
CaseNr	6
dirnam	AnimoGrassland(Ruurlo)
Purpose	waterbalans terms distribution
Location	Ruurlo-NL
SimulationPeriod	1980-1984
SoilType	sandy loam
CropType	grassland
drainage	basic
irrigation	none
bottomboundary	q/h
reference	Renaud et al ()

Project: RuurloGras
File name: RuurloGras.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:33 2017
Simulation stopped at Mon Jun 12 11:39:36 2017
Simulation elapsed time 2.74 (sec)

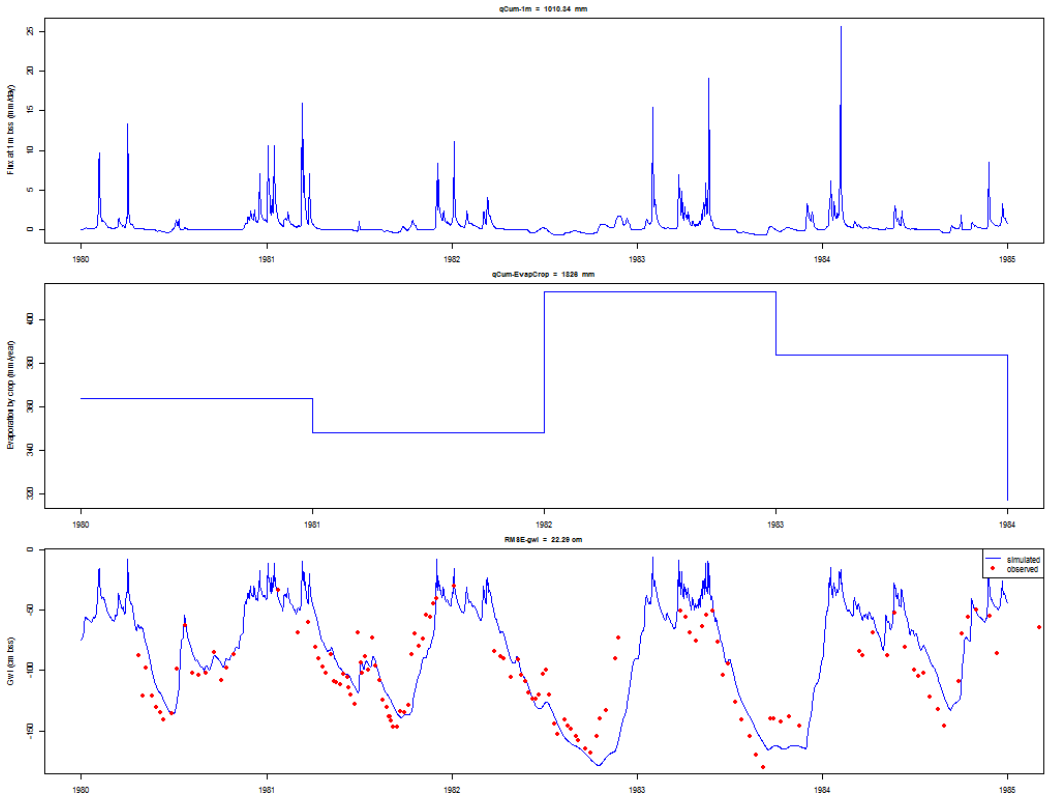
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 27: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 28: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	1010.34			
2	qCum-EvapCrop	mm	1826.00			
3	RMSE-gwl	cm	-86.14	-104.14	3.35	22.29



Figuur 6: AnimoGrassland(Ruurlo)

Tabel 29: Waterbalans

	1	2	3	4	5
ipl	1	1	1	1	1
yr	1980	1981	1982	1983	1984
Igrai	743	805	616	763	744
Igsnow	0	0	0	0	0
Igirr	0	0	0	0	0
RunOn	0	0	0	0	0
fldrin1	0	0	0	0	0
fldrin2	0	0	0	0	0
fldrin3	0	0	0	0	0
flindr4	0	0	0	0	0
fldrin5	0	0	0	0	0
flbtin	0	0	0	0	0
evicpr	-90	-95	-81	-64	-70
evicir	0	0	0	0	0
evso	-75	-73	-79	-83	-68
evsubl	0	0	0	0	0
evpn	0	0	0	0	0
flev	-364	-348	-413	-384	-317
runoff	0	0	0	0	0
fldrou1	-21	-29	-13	-24	-27
fldrou2	0	0	0	0	0
fldrou3	0	0	0	0	0
fldrou4	0	0	0	0	0
fldrou5	0	0	0	0	0
flbtou	-159	-257	-87	-208	-209
deltast	-35	-2	57	-1	-52
deltapn	0	0	0	0	0
deltasnow	0	0	0	0	0
badev	0	0	0	0	0
evsoma	-84	-81	-96	-95	-75
evtrma	-372	-356	-422	-416	-329

9 DrainageBasic(EuroHarpDKO)

Tabel 30: Description of case

	7
CaseNr	7
dirnam	DrainageBasic(EuroHarpDKO)
Purpose	convergence of numerical solution
Location	Denmark
SimulationPeriod	
SoilType	
CropType	mixed
drainage	
irrigation	
bottomboundary	
reference	Schoumans et al ()

Project: run.11111.2.swap
File name: run.11111.2.swap.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:37 2017
Simulation stopped at Mon Jun 12 11:39:44 2017
Simulation elapsed time 6.38 (sec)

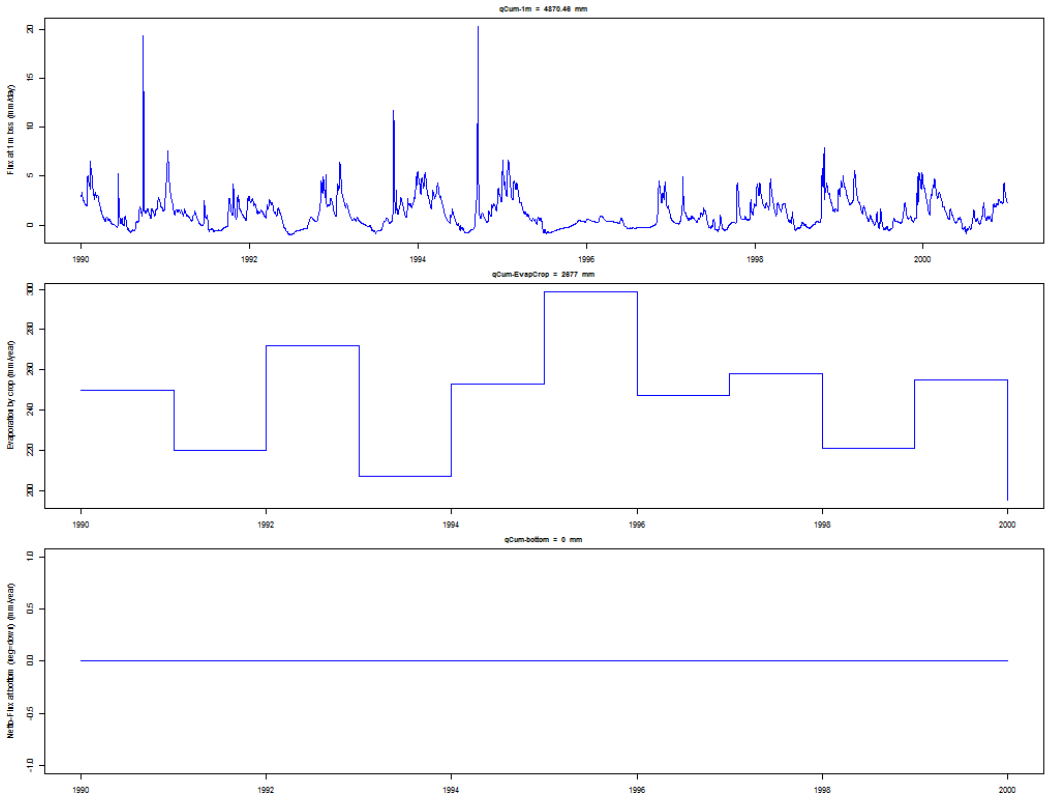
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 31: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 32: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	4870.46			
2	qCum-EvapCrop	mm	2677.00			
3	qCum-bottom	cm	0.00			



Figuur 7: DrainageBasic(EuroHarpDKO)

Tabel 33: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11
ipl	1	1	1	1	1	1	1	1	1	1	1
yr	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Igrai	963	776	785	924	1070	743	577	722	1001	1007	904
Igsnow	0	0	0	0	0	0	0	0	0	0	0
Igirr	0	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0	0
evicpr	-26	-21	-26	-37	-21	-13	-20	-19	-29	-31	-21
evicir	0	0	0	0	0	0	0	0	0	0	0
evso	-172	-162	-164	-134	-182	-190	-132	-191	-175	-172	-182
evsubl	0	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0	0
flev	-250	-220	-272	-207	-253	-299	-247	-258	-221	-255	-195
runoff	0	0	0	0	0	0	0	0	0	0	0
fldrou1	-93	-91	-88	-92	-94	-86	-73	-89	-93	-93	-94
fldrou2	-422	-301	-261	-382	-527	-392	0	-81	-464	-444	-442
fldrou3	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0
flbtou	0	0	0	0	0	0	0	0	0	0	0
deltast	0	20	24	-72	6	237	-105	-84	-20	-13	31
deltapn	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0
evsoma	-340	-334	-341	-310	-342	-316	-308	-366	-296	-332	-366
evtrma	-250	-223	-274	-207	-253	-304	-249	-259	-221	-255	-195

10 DrainageBasic(Hupsel)

Tabel 34: Description of case

	8
CaseNr	8
dirnam	DrainageBasic(Hupsel)
Purpose	general reference; interaction between water, solute and crop growth
Location	Hupsel-NL
SimulationPeriod	1980-1982
SoilType	2 layers, loamy-sand
CropType	maize, potatoes
drainage	basic, tile drains
irrigation	tracer application
bottomboundary	zero flux
reference	Van den Eerthweg en Meinardi (1999)

Project: hupsel
File name: hupsel.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:45 2017
Simulation stopped at Mon Jun 12 11:39:47 2017
Simulation elapsed time 2.32 (sec)

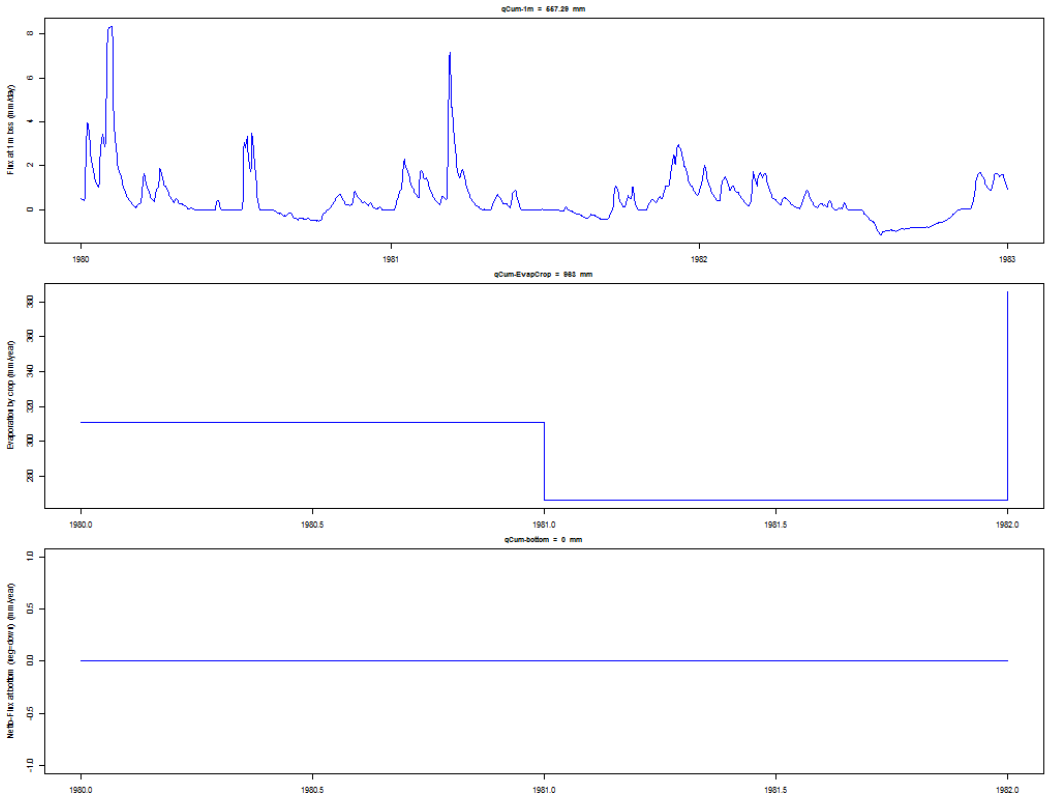
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 35: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 36: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	557.29			
2	qCum-EvapCrop	mm	963.00			
3	qCum-bottom	cm	0.00			



Figuur 8: DrainageBasic(Hupsel)

Tabel 37: Waterbalans

	1	2	3
ipl	1	1	1
yr	1980	1981	1982
Igrai	647	775	566
Igsnow	13	24	1
Igirr	1	0	0
RunOn	0	0	0
fldrin1	0	0	0
fldrin2	0	0	0
fldrin3	0	0	0
flindr4	0	0	0
fldrin5	0	0	0
flbtin	0	0	0
evicpr	-44	-20	-40
evicir	0	0	0
evso	-135	-157	-155
evsubl	-9	0	0
evpn	0	0	0
flev	-311	-266	-386
runoff	-40	-1	0
fldrou1	-378	-310	-145
fldrou2	0	0	0
fldrou3	0	0	0
fldrou4	0	0	0
fldrou5	0	0	0
flbtou	0	0	0
deltast	36	-46	158
deltapn	0	0	0
deltasnow	220	0	0
badev	0	0	0
evsoma	-338	-282	-340
evtrma	-337	-266	-406

11 DrainageExtended(STONE2uc6)

Tabel 38: Description of case

	9
CaseNr	9
dirnam	DrainageExtended(STONE2uc6)
Purpose	convergence of numerical solution
Location	NL
SimulationPeriod	
SoilType	
CropType	wheat, maize
drainage	
irrigation	
bottomboundary	prescribed flux
reference	Kroes et al ()

Project: Stoneuc6
File name: Stoneuc6.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:48 2017
Simulation stopped at Mon Jun 12 11:39:55 2017
Simulation elapsed time 6.68 (sec)

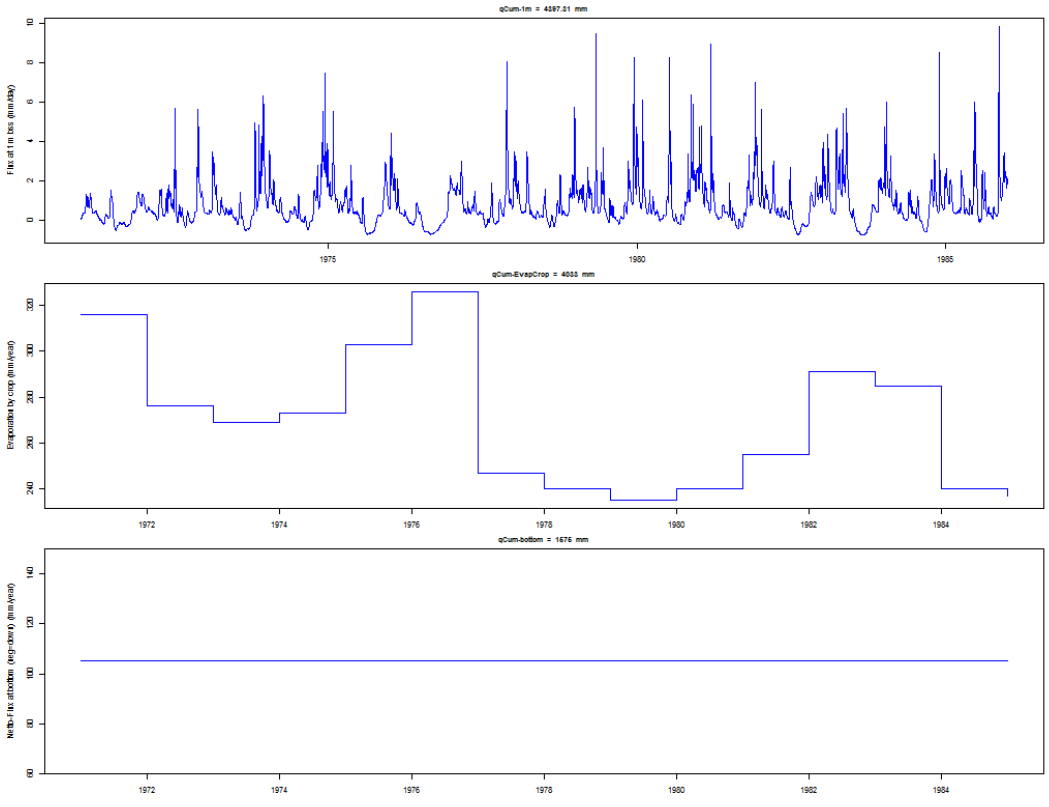
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 39: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 40: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	4397.31			
2	qCum-EvapCrop	mm	4033.00			
3	qCum-bottom	cm	1575.00			



Figuur 9: DrainageExtended(STONE2uc6)

Tabel 41: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12	13
ipl	1	1	1	1	1	1	1	1	1	1	1	1	1
yr	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Igrai	599	740	793	824	695	588	789	712	874	837	879	701	840
Igsnow	0	0	0	0	0	0	0	0	0	0	0	0	0
Igirr	0	0	0	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	1	0	0	0	1	1	0	0	0	0	0	1	1
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0	0	0	0
evicpr	-68	-57	-79	-89	-77	-72	-85	-88	-81	-83	-85	-76	-84
evicir	0	0	0	0	0	0	0	0	0	0	0	0	0
evso	-104	-132	-117	-108	-113	-95	-102	-105	-124	-107	-108	-121	-118
evsubl	0	0	0	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0	0
flev	-316	-276	-269	-273	-303	-326	-247	-240	-235	-240	-255	-291	-285
runoff	0	0	0	-1	-2	-1	-3	0	-2	0	-12	0	-6
fldrou1	-6	-13	-17	-14	-14	-7	-12	-17	-21	-18	-17	-13	-14
fldrou2	-3	-10	-17	-18	-15	-6	-8	-14	-25	-23	-22	-10	-21
fldrou3	0	-1	-2	-2	-1	-1	-1	-2	-3	-3	-3	-1	-3
fldrou4	-16	-94	-173	-198	-117	-58	-74	-133	-249	-258	-256	-82	-242
fldrou5	0	-3	-5	-4	0	0	-17	-4	-25	-16	-24	-1	-4
flbtou	-105	-105	-105	-105	-105	-105	-105	-105	-105	-105	-105	-105	-105
deltast	19	-49	-9	-11	52	81	-135	-5	-4	17	7	-1	42
deltapn	0	0	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-201	-213	-224	-226	-223	-260	-214	-206	-199	-202	-198	-228	-213
evtrma	-319	-280	-275	-278	-313	-333	-248	-246	-246	-254	-260	-295	-299

12 DrainageExtended(Timing)

Tabel 42: Description of case

	10
CaseNr	10
dirnam	DrainageExtended(Timing)
Purpose	convergence of numerical solution
Location	
SimulationPeriod	
SoilType	
CropType	dummy
drainage	
irrigation	
bottomboundary	
reference	Kroes et al ()

Project: swap
File name: swap.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:56 2017
Simulation stopped at Mon Jun 12 11:39:57 2017
Simulation elapsed time 1.08 (sec)

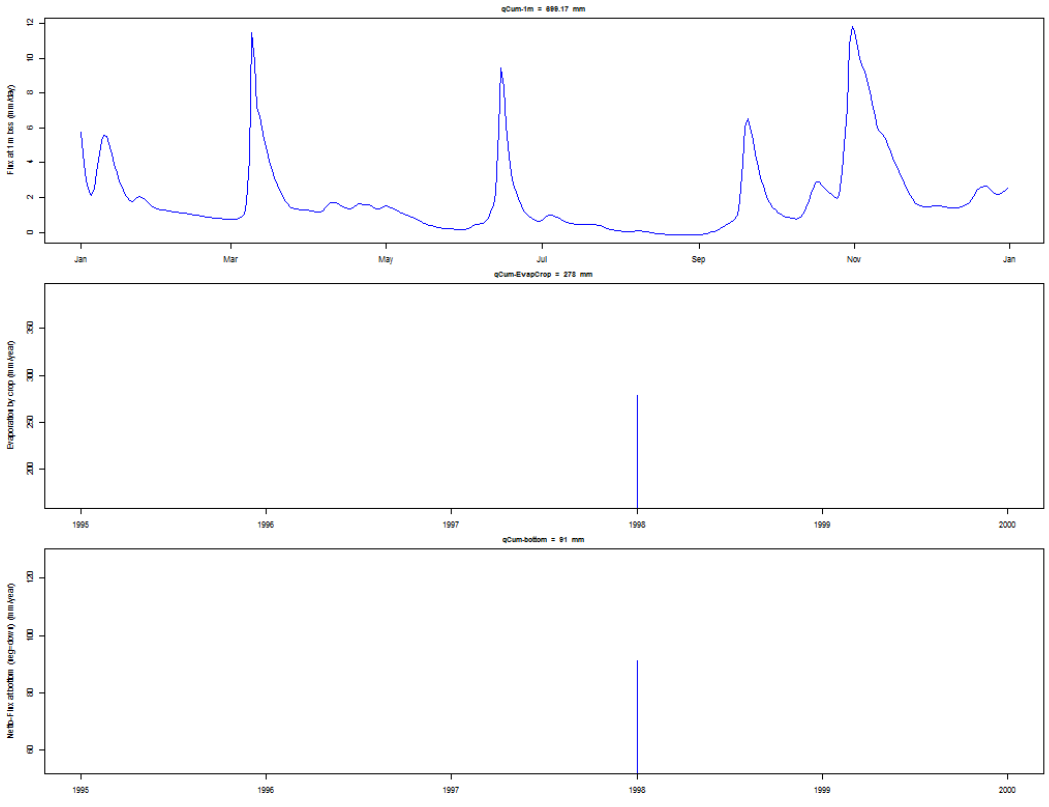
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 43: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 44: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	699.17			
2	qCum-EvapCrop	mm	278.00			
3	qCum-bottom	cm	91.00			



Figuur 10: DrainageExtended(Timing)

Tabel 45: Waterbalans

	x
ipl	1
yr	1998
Igrai	1185
Igsnow	0
Igirr	0
RunOn	0
fldrin1	0
fldrin2	0
fldrin3	0
flindr4	0
fldrin5	0
flbtin	0
evicpr	-50
evicir	0
evso	-155
evsubl	0
evpn	0
flev	-278
runoff	0
fldrou1	-156
fldrou2	-257
fldrou3	-201
fldrou4	0
fldrou5	0
flbtou	-91
deltast	4
deltapn	0
deltasnow	0
badev	0
evsoma	-232
evtrma	-279

13 DrainageExtended(Wildenborch)

Tabel 46: Description of case

	11
CaseNr	11
dirnam	DrainageExtended(Wildenborch)
Purpose	very wet grassland
Location	Wildenborch-NL
SimulationPeriod	
SoilType	
CropType	grassland
drainage	
irrigation	
bottomboundary	
reference	Kroes et al ()

Project: Wildenborch
File name: Wildenborch.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:39:58 2017
Simulation stopped at Mon Jun 12 11:40:02 2017
Simulation elapsed time 4.14 (sec)

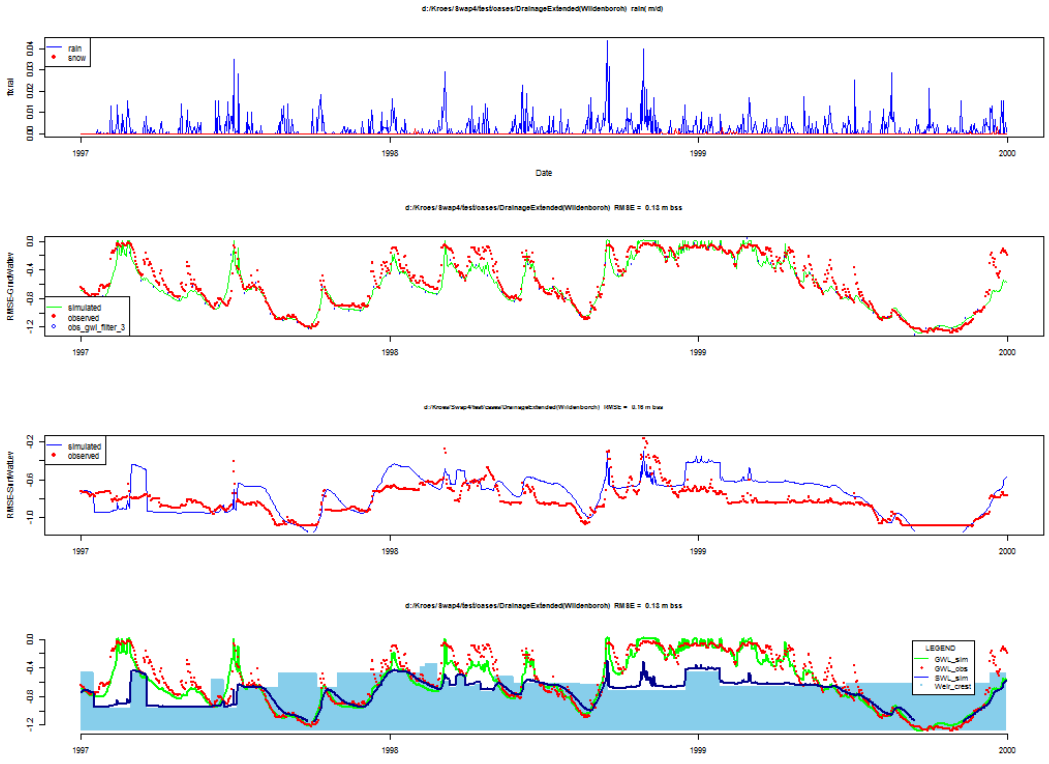
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 47: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	200	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-05	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 48: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	RMSE-GrndWatlev	m bss	-0.64	-0.58	-0.05	0.13
2	RMSE-SurfWatLev	m bss	-0.74	-0.83		0.16
3	qCumDrainOut	mm	-490.00			



Figuur 11: DrainageExtended(Wildenborch)

Tabel 49: Waterbalans

	1	2	3
ipl	1	1	1
yr	1997	1998	1999
Igrai	674	1044	779
Igsnow	1	9	13
Igirr	0	0	0
RunOn	0	0	0
fldrin1	4	5	3
fldrin2	0	1	0
fldrin3	0	0	0
flindr4	0	0	0
fldrin5	0	0	0
flbtin	318	224	181
evicpr	-79	-105	-95
evicir	0	0	0
evso	-80	-69	-85
evsubl	0	-1	-1
evpn	0	0	0
flev	-411	-328	-416
runoff	-19	-215	-33
fldrou1	-74	-118	-89
fldrou2	-25	-103	-81
fldrou3	0	0	0
fldrou4	0	0	0
fldrou5	0	0	0
flbtou	-277	-324	-209
deltast	-32	-20	33
deltapn	0	0	0
deltasnow	0	0	0
badev	0	0	0
evsoma	-95	-77	-97
evtrma	-419	-340	-428

14 GwlMeasuredasbottomBC(Ruurlo)

Tabel 50: Description of case

	12
CaseNr	12
dirnam	GwlMeasuredasbottomBC(Ruurlo)
Purpose	verification of swbotb=1 (Gwl as special bottomBC)
Location	Ruurlo-NL
SimulationPeriod	1980-1984
SoilType	sandy loam
CropType	grassland
drainage	basic
irrigation	none
bottomboundary	q/h
reference	Renaud et al ()

Project: RuurloGras
File name: RuurloGras.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:40:04 2017
Simulation stopped at Mon Jun 12 11:40:06 2017
Simulation elapsed time 2.74 (sec)

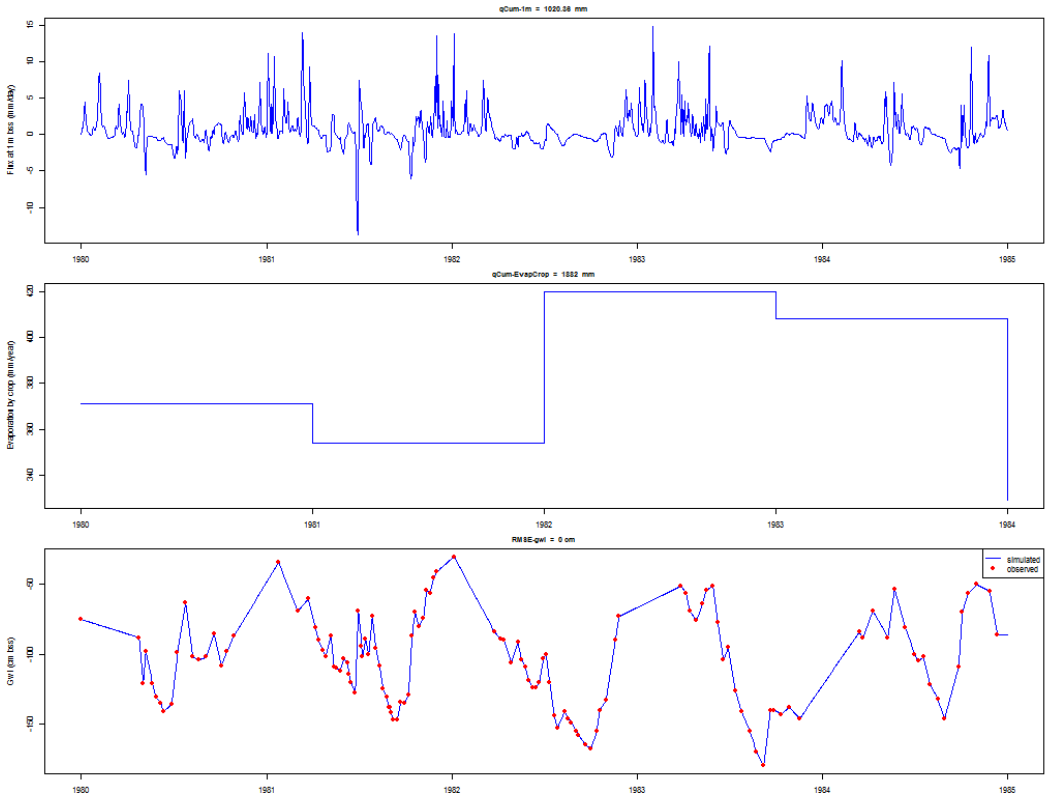
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 51: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 52: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	1020.36			
2	qCum-EvapCrop	mm	1882.00			
3	RMSE-gwl	cm	-94.54	-104.53	0.00	0.00



Figuur 12: GwlMeasuredasbottomBC(Ruurlo)

Tabel 53: Waterbalans

	1	2	3	4	5
ipl	1	1	1	1	1
yr	1980	1981	1982	1983	1984
Igrai	743	805	616	763	744
Igsnow	0	0	0	0	0
Igirr	0	0	0	0	0
RunOn	0	0	0	0	0
fldrin1	0	0	0	0	0
fldrin2	0	0	0	0	0
fldrin3	0	0	0	0	0
flindr4	0	0	0	0	0
fldrin5	0	0	0	0	0
flbtin	160	240	192	148	188
evicpr	-90	-95	-81	-64	-70
evicir	0	0	0	0	0
evso	-75	-73	-79	-81	-68
evsubl	0	0	0	0	0
evpn	0	0	0	0	0
flev	-371	-354	-420	-408	-329
runoff	0	0	0	0	0
fldrou1	0	-16	-8	-1	-1
fldrou2	0	0	0	0	0
fldrou3	0	0	0	0	0
fldrou4	0	0	0	0	0
fldrou5	0	0	0	0	0
flbtou	-337	-492	-254	-417	-426
deltast	-29	-15	34	60	-37
deltapn	0	0	0	0	0
deltasnow	0	0	0	0	0
badev	0	0	0	0	0
evsoma	-84	-81	-96	-95	-75
evtrma	-372	-356	-422	-416	-329

15 GwlShallow(Zegveld)

Tabel 54: Description of case

	13
CaseNr	13
dirnam	GwlShallow(Zegveld)
Purpose	shallow gwl with drainage
Location	Zegveld-NL
SimulationPeriod	
SoilType	
CropType	grassland
drainage	
irrigation	
bottomboundary	
reference	Hendriks et al ()

Project: zeg13
File name: zeg13.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:40:07 2017
Simulation stopped at Mon Jun 12 11:40:28 2017
Simulation elapsed time 20.83 (sec)

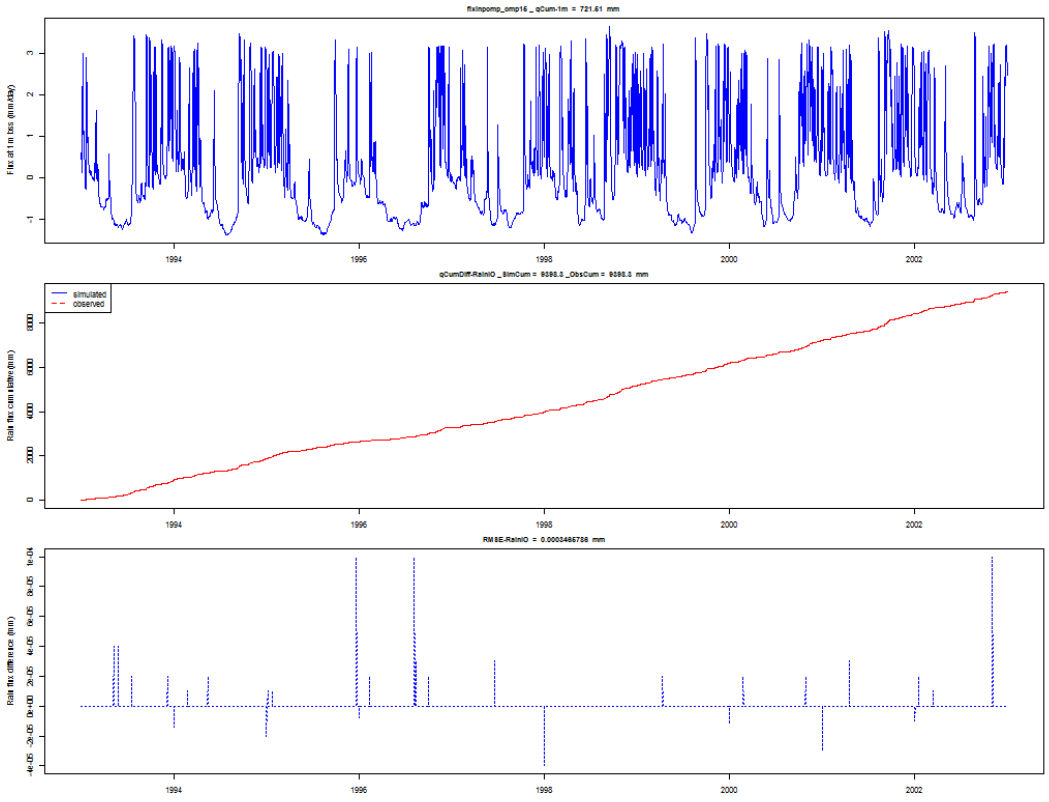
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 55: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	900	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	5	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 56: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	721.51			
2	qCumDiff-RainIO	mm	9398.30	9398.30	0.00	
3	RMSE-RainIO	mm	4387.05	4387.04	0.00	0.00



Figuur 13: GwlShallow(Zegveld)

Tabel 57: Waterbalans

	1	2	3	4	5	6	7	8	9	10
ipl	1	1	1	1	1	1	1	1	1	1
yr	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Igrai	922	959	767	646	674	1193	1020	1014	1215	989
Igsnow	0	0	0	0	0	0	0	0	0	0
Igirr	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0
fldrin1	263	261	319	340	311	194	273	243	179	241
fldrin2	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0
evicpr	-87	-97	-86	-70	-80	-112	-106	-107	-121	-98
evicir	0	0	0	0	0	0	0	0	0	0
evso	-101	-95	-96	-83	-102	-99	-100	-104	-103	-105
evsubl	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0
flev	-430	-407	-462	-437	-474	-362	-465	-426	-357	-409
runoff	-134	-144	-60	-54	-45	-197	-142	-96	-184	-125
fldrou1	-87	-105	-79	-65	-46	-144	-105	-118	-147	-107
fldrou2	-208	-252	-186	-155	-110	-344	-247	-276	-349	-255
fldrou3	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0
flbtou	-128	-127	-123	-122	-126	-132	-126	-129	-133	-131
deltast	-2	0	5	0	-3	3	-2	-1	0	0
deltapn	-7	6	1	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0
evsoma	-119	-125	-133	-117	-121	-111	-127	-120	-117	-120
evtrma	-494	-515	-557	-501	-518	-437	-537	-491	-438	-462

16 Hysterese(Hupsel)

Tabel 58: Description of case

	14
CaseNr	14
dirnam	Hysterese(Hupsel)
Purpose	hysteresis
Location	Hupsel-NL
SimulationPeriod	1980-1984
SoilType	
CropType	maize, potatoes
drainage	
irrigation	
bottomboundary	
reference	Van den Eerthweg en Meinardi (1999)

Project: HupselHyst
File name: HupselHyst.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:40:29 2017
Simulation stopped at Mon Jun 12 11:40:31 2017
Simulation elapsed time 2.11 (sec)

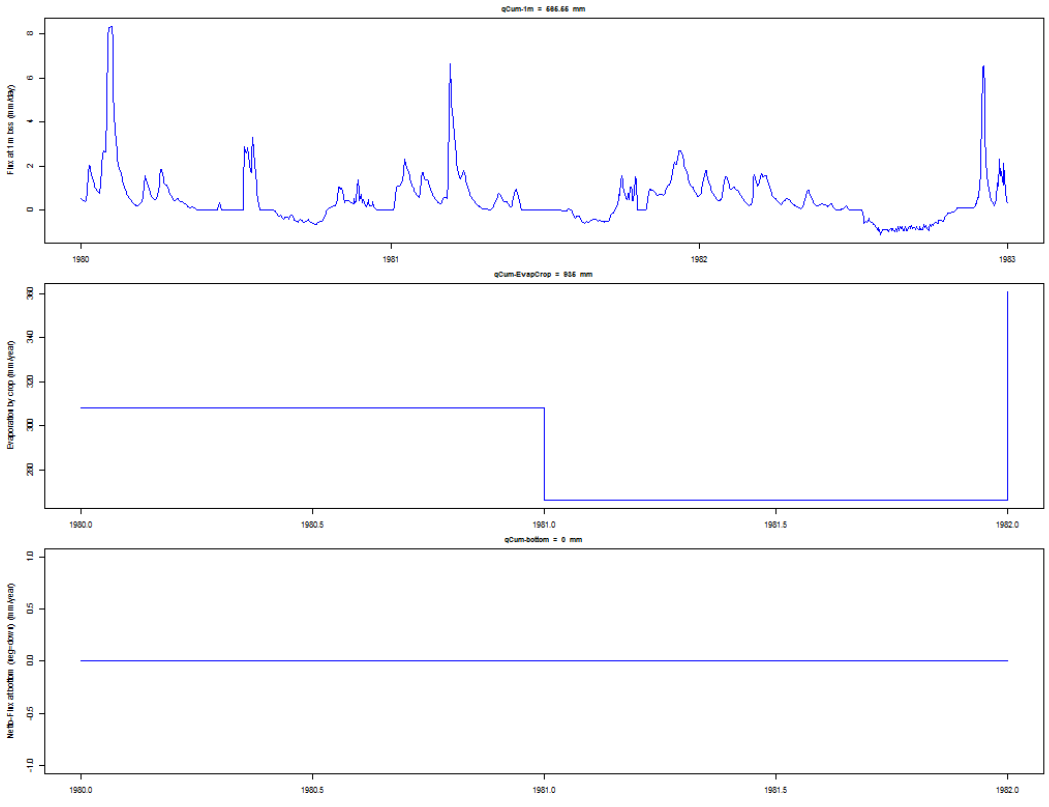
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 59: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 60: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	565.55			
2	qCum-EvapCrop	mm	935.00			
3	qCum-bottom	cm	0.00			



Figuur 14: Hysterese(Hupsel)

Tabel 61: Waterbalans

	1	2	3
ipl	1	1	1
yr	1980	1981	1982
Igrai	647	775	566
Igsnow	13	24	1
Igirr	1	0	0
RunOn	0	0	0
fldrin1	0	0	0
fldrin2	0	0	0
fldrin3	0	0	0
flindr4	0	0	0
fldrin5	0	0	0
flbtin	0	0	0
evicpr	-44	-20	-40
evicir	0	0	0
evso	-135	-157	-153
evsubl	-9	0	0
evpn	0	0	0
flev	-308	-266	-361
runoff	-33	0	0
fldrou1	-344	-319	-146
fldrou2	0	0	0
fldrou3	0	0	0
fldrou4	0	0	0
fldrou5	0	0	0
flbtou	0	0	0
deltast	-8	-37	133
deltapn	0	0	0
deltasnow	220	0	0
badev	0	0	0
evsoma	-338	-282	-340
evtrma	-337	-266	-406

17 InfiltrationRunoff(VanDamFeddes2000)

Tabel 62: Description of case

	15
CaseNr	15
dirnam	InfiltrationRunoff(VanDamFeddes2000)
Purpose	accuracy of infiltration and surface runoff
Location	
SimulationPeriod	transient
SoilType	homogeneous sand
CropType	BareSoil
drainage	no
irrigation	no
bottomboundary	zero flux
reference	VanDam and Feddes 2000)

Project: InfiltrRunoff
File name: InfiltrRunoff.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:40:32 2017
Simulation stopped at Mon Jun 12 11:40:33 2017
Simulation elapsed time 1.03 (sec)

Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 63: Iteration parameters

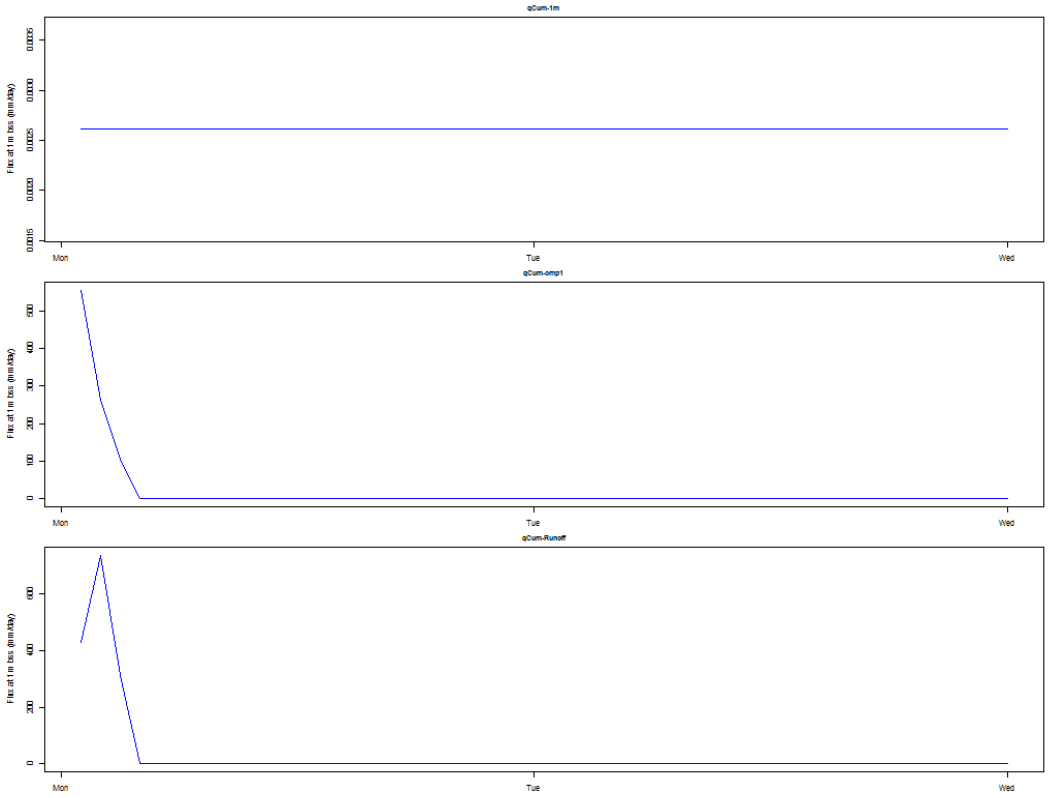
	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 64: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	0.13			
2	qCum-cmp1	mm	924.20			
3	qCum-Runoff	mm	1475.78			

Tabel 65: Waterbalans

values	none



Figuur 15: InfiltrationRunoff(VanDamFeddes2000)

18 Interception(Speuld)

Tabel 66: Description of case

	16
CaseNr	16
dirnam	Interception(Speuld)
Purpose	Evaporation by interception, forest
Location	Speuld-NL
SimulationPeriod	
SoilType	
CropType	Douglas fir
drainage	
irrigation	
bottomboundary	
reference	Tiktak et al ()

Project: speuld
File name: speuld.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:40:34 2017
Simulation stopped at Mon Jun 12 11:40:38 2017
Simulation elapsed time 4.11 (sec)

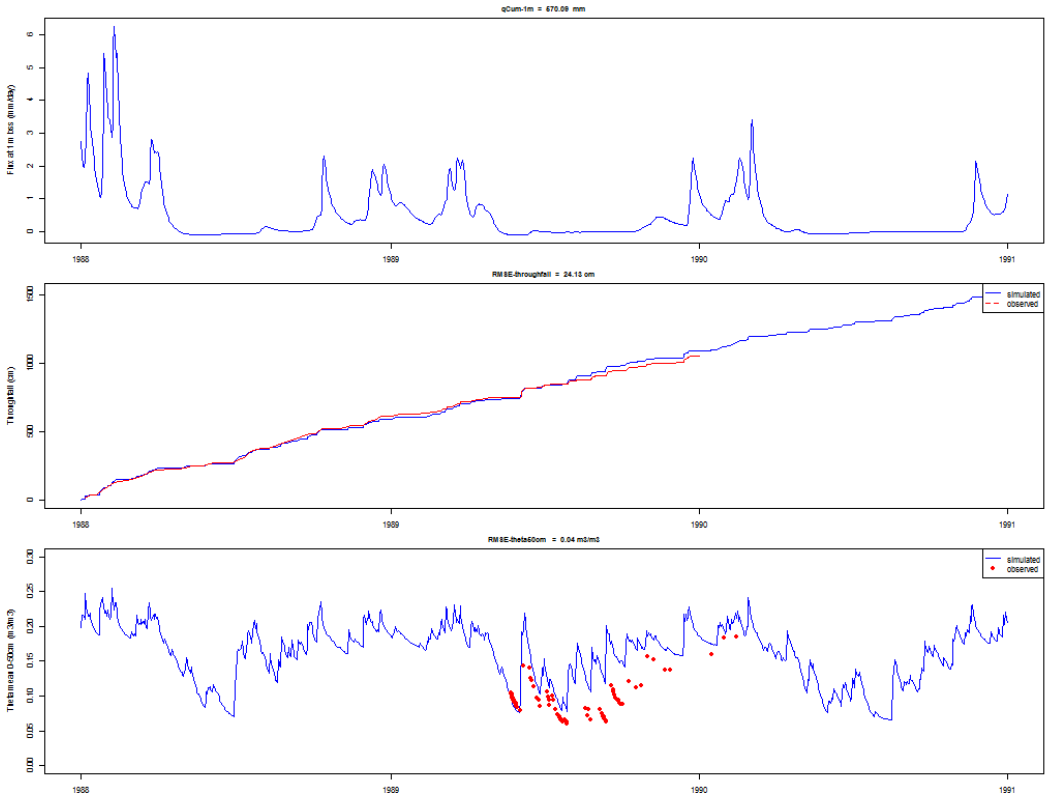
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 67: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 68: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	570.09			
2	RMSE-throughfall	mm	774.45	768.07	6.39	24.13
3	RMSE-theta50cm	-	0.16	0.11	0.03	0.04



Figuur 16: Interception(Speuld)

Tabel 69: Waterbalans

	1	2	3
ipl	1	1	1
yr	1988	1989	1990
Igrai	933	806	715
Igsnow	0	0	0
Igirr	0	0	0
RunOn	0	0	0
fldrin1	0	0	0
fldrin2	0	0	0
fldrin3	0	0	0
flindr4	0	0	0
fldrin5	0	0	0
flbtin	0	0	0
evicpr	-336	-307	-283
evicir	0	0	0
evso	-66	-76	-70
evsubl	0	0	0
evpn	0	0	0
flev	-286	-355	-280
runoff	0	0	0
fldrou1	0	0	0
fldrou2	0	0	0
fldrou3	0	0	0
fldrou4	0	0	0
fldrou5	0	0	0
flbtou	-430	-121	-73
deltast	186	53	-8
deltapn	0	0	0
deltasnow	0	0	0
badev	0	0	0
evsoma	-86	-110	-108
evtrma	-313	-402	-393

19 Interflow(Vlietpolder)

Tabel 70: Description of case

	17
CaseNr	17
dirnam	Interflow(Vlietpolder)
Purpose	shallow gwl with interflow and drainage
Location	Vlietpolder-NL
SimulationPeriod	
SoilType	
CropType	grassland
drainage	
irrigation	
bottomboundary	
reference	Hendriks et al ()

Project: Vlietp
File name: Vlietp.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:40:40 2017
Simulation stopped at Mon Jun 12 11:40:44 2017
Simulation elapsed time 3.96 (sec)

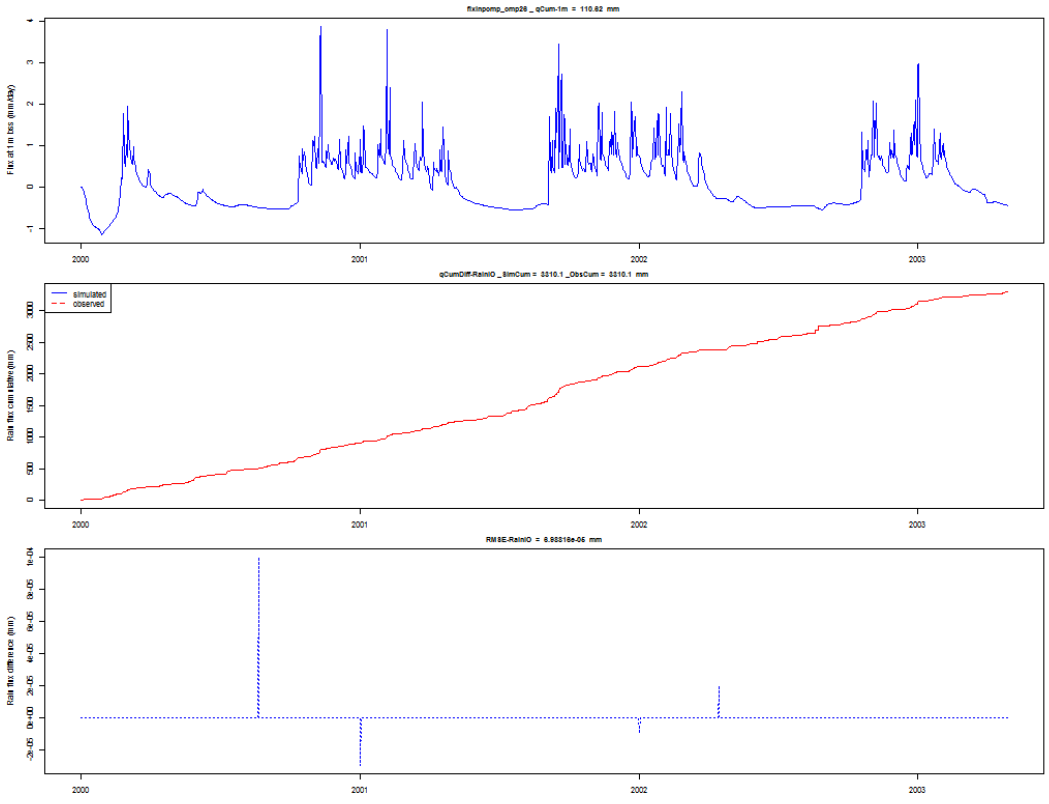
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 71: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 72: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	110.62			
2	qCumDiff-RainIO	mm	3310.10	3310.10	0.00	
3	RMSE-RainIO	mm	1658.46	1658.46	0.00	0.00



Figuur 17: Interflow(Vlietpolder)

Tabel 73: Waterbalans

	1	2	3
ipl	1	1	1
yr	2000	2001	2002
Igrai	908	1215	989
Igsnow	0	0	0
Igirr	0	0	0
RunOn	0	0	0
fldrin1	163	71	108
fldrin2	0	0	0
fldrin3	0	0	0
flindr4	0	0	0
fldrin5	0	0	0
flbtin	0	0	0
evicpr	-105	-121	-98
evicir	0	0	0
evso	-96	-99	-100
evsubl	0	0	0
evpn	0	0	0
flev	-442	-413	-449
runoff	-79	-135	-119
fldrou1	-78	-171	-122
fldrou2	-118	-325	-187
fldrou3	0	0	0
fldrou4	0	0	0
fldrou5	0	0	0
flbtou	-20	-22	-21
deltast	-132	-1	0
deltapn	0	0	0
deltasnow	0	0	0
badev	0	0	0
evsoma	-113	-113	-115
evtrma	-459	-442	-467

20 IrrigationScheduledFixedTiming(Sevilla)

Tabel 74: Description of case

	18
CaseNr	18
dirnam	IrrigationScheduledFixedTiming(Sevilla)
Purpose	scheduled irrigation
Location	Sevilla-Spain
SimulationPeriod	
SoilType	
CropType	Apples1
drainage	
irrigation	
bottomboundary	
reference	Focus (2000)

Project: Sevi
File name: Sevi.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:40:45 2017
Simulation stopped at Mon Jun 12 11:41:00 2017
Simulation elapsed time 15.13 (sec)

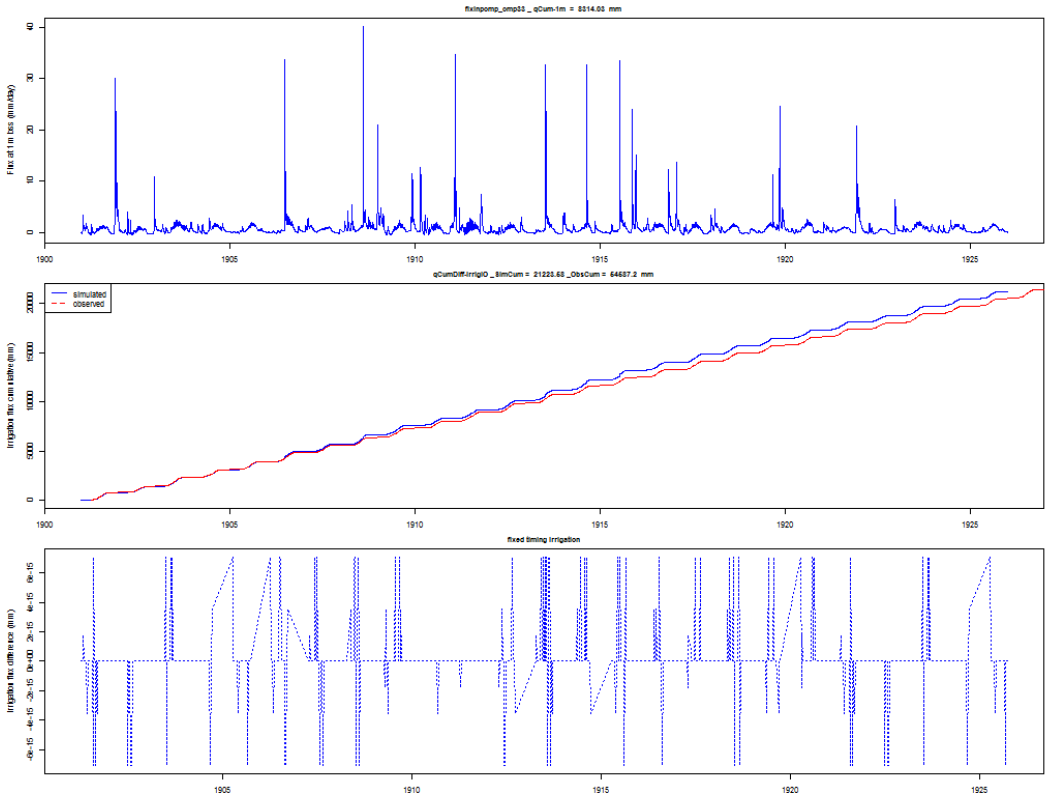
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 75: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 76: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	8314.03			
2	qCumDiff-IrrigIO	mm	21223.58	54587.20	-33363.62	
3	RMSE-IrrigIO	mm	10652.54	10233.89	0.00	0.00



Figuur 18: IrrigationScheduledFixedTiming(Sevilla)

Tabel 77: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12
ipl	1	1	1	1	1	1	1	1	1	1	1	1
yr	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
Igrai	808	434	370	378	316	277	472	849	594	573	681	379
Igsnow	0	0	0	0	0	0	0	0	0	0	0	0
Igirr	817	611	929	759	791	1075	735	978	939	712	894	935
RunOn	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0	0	0
evicpr	0	0	0	0	0	0	0	0	0	0	0	0
evicir	0	0	0	0	0	0	0	0	0	0	0	0
evso	-380	-297	-334	-269	-268	-292	-327	-334	-373	-300	-343	-336
evsubl	0	0	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0
flev	-1054	-868	-1006	-979	-970	-1072	-975	-1106	-1147	-1037	-998	-1194
runoff	0	0	0	0	0	0	0	0	0	0	0	0
fldrou1	0	0	0	0	0	0	0	0	0	0	0	0
fldrou2	0	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0	0
flbtou	-11	-57	-4	-2	-1	0	0	0	-9	-15	-87	-15
deltast	-181	177	45	113	131	12	94	-388	-4	67	-147	232
deltapn	0	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-580	-486	-542	-531	-534	-522	-503	-507	-526	-511	-517	-550
evtrma	-1059	-902	-1013	-983	-979	-1091	-995	-1138	-1154	-1042	-1110	-1203

21 MacroPores1

Tabel 78: Description of case

	19
CaseNr	19
dirnam	MacroPores1
Purpose	macropore flow
Location	Andelst-NL
SimulationPeriod	
SoilType	
CropType	WintCer1
drainage	
irrigation	
bottomboundary	
reference	Hendriks et al ()

Project: Andelst
File name: Andelst.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:41:01 2017
Simulation stopped at Mon Jun 12 11:42:17 2017
Simulation elapsed time 76.36 (sec)

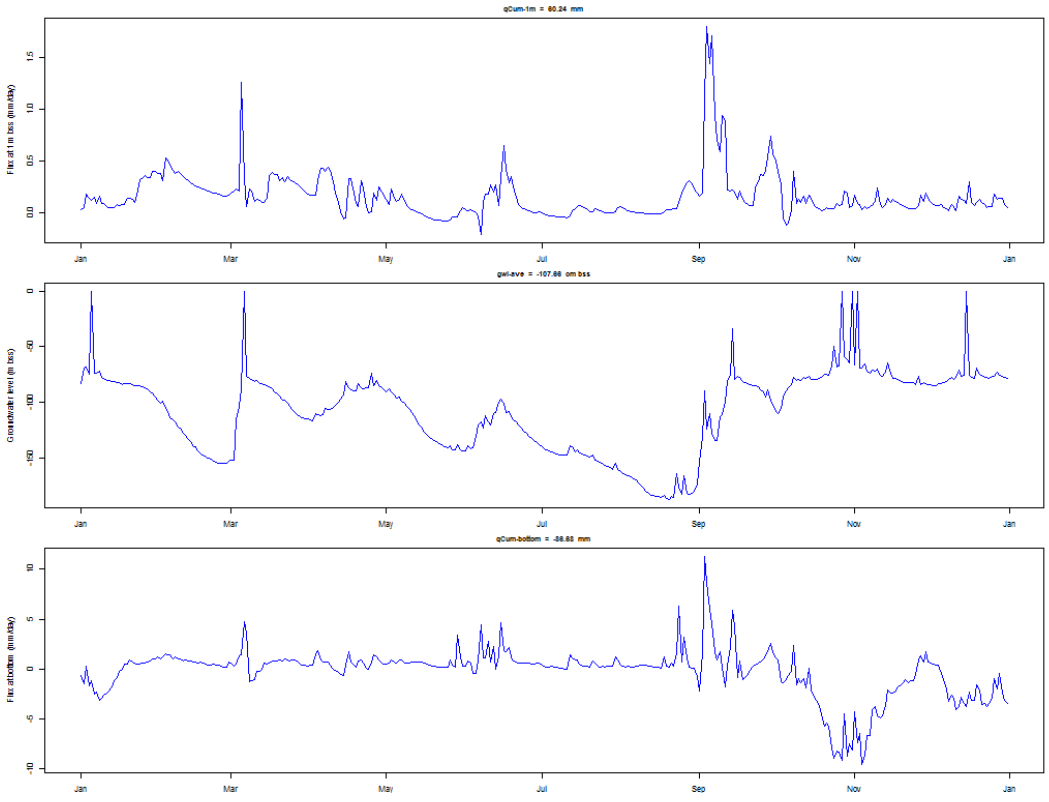
Succesfull completion of simulation: yes
Succesfull closure of water balance: no

Tabel 79: Iteration parameters

	variables	values	units
1	DTMIN	1e-05	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	999	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 80: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	60.24			
2	gwl-ave	cm bss	-107.66			
3	qCum-bottom	mm	-86.68			



Figuur 19: MacroPores1

Tabel 81: Waterbalans

	x
ipl	1
yr	1998
Igrai	1112
Igsnow	0
Igirr	0
RunOn	0
fldrin1	0
fldrin2	0
fldrin3	0
flindr4	0
fldrin5	0
flbtin	324
evicpr	-31
evicir	0
evso	-252
evsubl	0
evpn	0
flev	-127
runoff	0
fldrou1	-28
fldrou2	0
fldrou3	0
fldrou4	0
fldrou5	0
flbtou	-237
deltast	-8
deltapn	0
deltasnow	0
badev	753
evsoma	-339
evtrma	-171

22 MacroPores2

Tabel 82: Description of case

	20
CaseNr	20
dirnam	MacroPores2
Purpose	macropore flow
Location	Vlierd-NL
SimulationPeriod	
SoilType	
CropType	grassnieuw
drainage	
irrigation	
bottomboundary	
reference	Hendriks et al ()

Project: Vlierd
File name: Vlierd.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:42:19 2017
Simulation stopped at Mon Jun 12 11:42:26 2017
Simulation elapsed time 7.34 (sec)

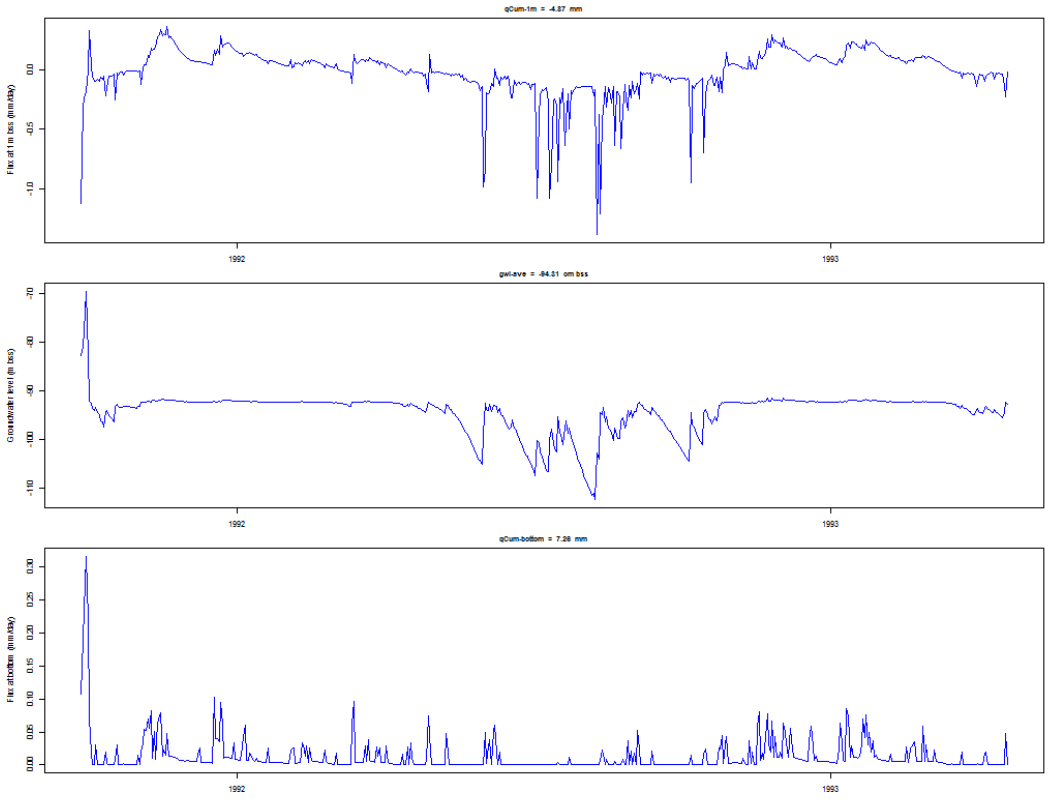
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 83: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 84: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	-4.87			
2	gwl-ave	cm bss	-94.31			
3	qCum-bottom	mm	7.26			



Figuur 20: MacroPores2

Tabel 85: Waterbalans

	x
ipl	1
yr	1991
Igrai	709
Igsnow	0
Igirr	0
RunOn	0
fldrin1	0
fldrin2	0
fldrin3	0
flindr4	0
fldrin5	0
flbtin	0
evicpr	-75
evicir	0
evso	-84
evsubl	-1
evpn	0
flev	-262
runoff	0
fldrou1	-59
fldrou2	0
fldrou3	0
fldrou4	0
fldrou5	0
flbtou	0
deltast	-63
deltapn	0
deltasnow	220
badev	384
evsoma	-125
evtrma	-359

23 MeteoDetailedInOut(Hupsel)

Tabel 86: Description of case

	21
CaseNr	21
dirnam	MeteoDetailedInOut(Hupsel)
Purpose	daily fluctuation of ET
Location	Hupsel-NL
SimulationPeriod	May 1980
SoilType	loamy sand
CropType	grass
drainage	tile drains
irrigation	no
bottomboundary	zero flux
reference	Allen et al, 1998, FAO56

Project: MeteoDaily
File name: MeteoDaily.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:42:27 2017
Simulation stopped at Mon Jun 12 11:42:29 2017
Simulation elapsed time 2.12 (sec)

Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 87: Iteration parameters

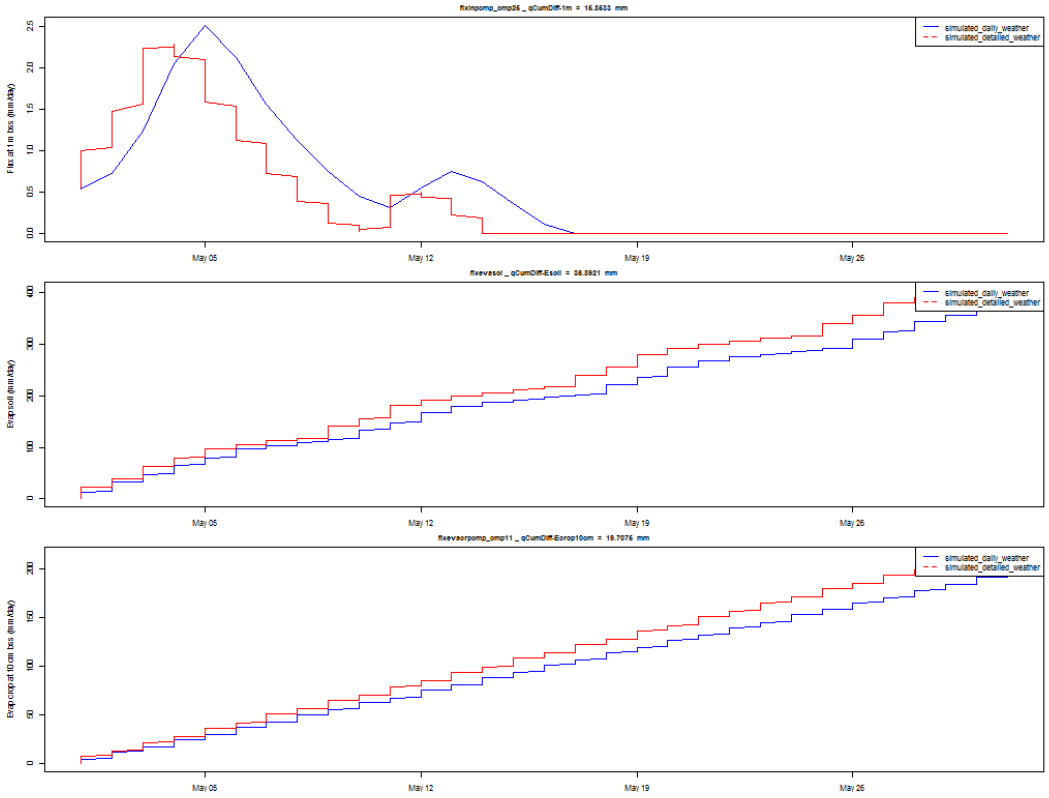
	variables	values	units
1	DTMIN	1e-04	(d)
2	DTMAX	0.5	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	50	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 88: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCumDiff-1m	mm	15.85	128.38	0.12	0.36
2	qCumDiff-Esoil	mm	36.89	420.26	-0.13	1.52
3	qCumDiff-Ecrop10cm	mm	19.71	219.56	-0.07	0.42

Tabel 89: Waterbalans

values	none



Figuur 21: MeteoDetailedInOut(Hupsel)

24 MeteoPrecipitationDetail(Andelst)

Tabel 90: Description of case

	22
CaseNr	22
dirnam	MeteoPrecipitationDetail(Andelst)
Purpose	rain events
Location	Andelst-NL
SimulationPeriod	
SoilType	
CropType	WintCer1
drainage	
irrigation	
bottomboundary	
reference	Hendriks et al ()

Project: Andelst
File name: Andelst.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:42:30 2017
Simulation stopped at Mon Jun 12 11:42:34 2017
Simulation elapsed time 4.4 (sec)

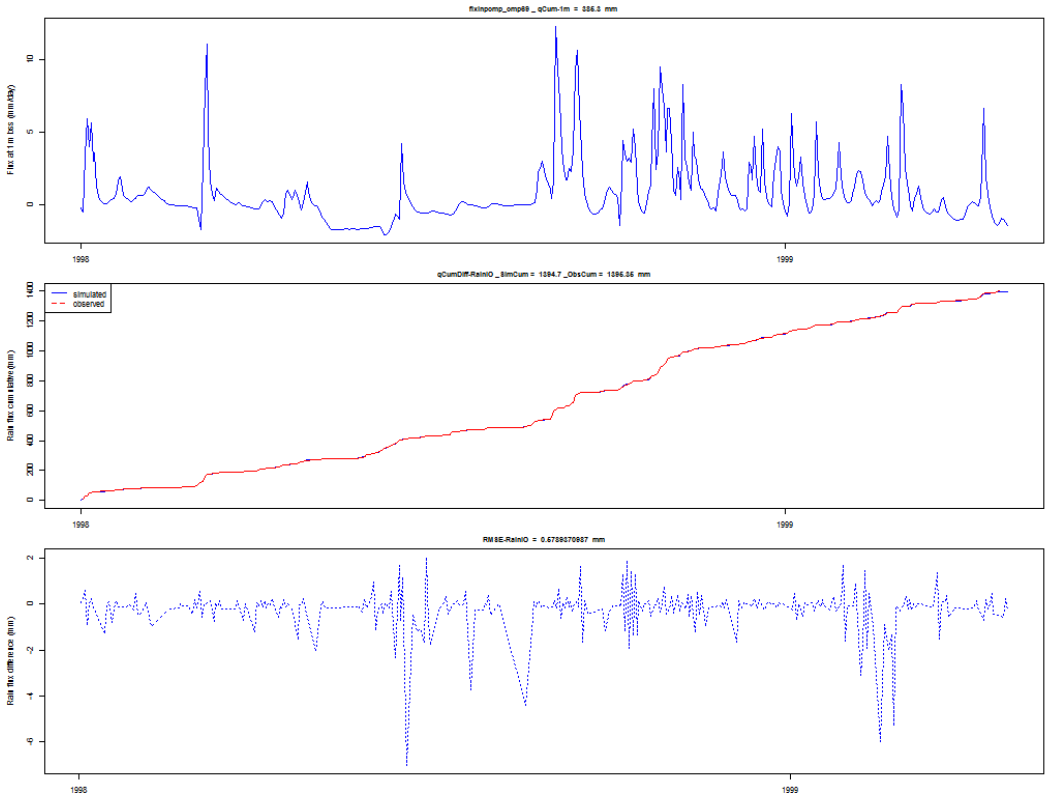
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 91: Iteration parameters

	variables	values	units
1	DTMIN	1e-05	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	999	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 92: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	385.30			
2	qCumDiff-RainIO	mm	1394.70	1395.35	-0.65	
3	RMSE-RainIO	mm	701.32	701.21	0.11	0.58



Figuur 22: MeteoPrecipitationDetail(Andelst)

Tabel 93: Waterbalans

	x
ipl	1
yr	1998
Igrai	1111
Igsnow	0
Igirr	0
RunOn	0
fldrin1	0
fldrin2	0
fldrin3	0
flindr4	0
fldrin5	0
flbtin	561
evicpr	-36
evicir	0
evso	-366
evsubl	0
evpn	0
flev	-208
runoff	-21
fldrou1	-952
fldrou2	0
fldrou3	0
fldrou4	0
fldrou5	0
flbtou	-90
deltast	2
deltapn	0
deltasnow	0
badev	0
evsoma	-469
evtrma	-216

25 PearlDrainageBasic

Tabel 94: Description of case

	23
CaseNr	23
dirnam	PearlDrainageBasic
Purpose	drainage
Location	Wassenaar
SimulationPeriod	1993-1994
SoilType	Sand
CropType	Flower bulbs
drainage	basic
irrigation	no
bottomboundary	Sine function
reference	Van den Berg (2006)

Project: PearlBasicDrain
File name: PearlBasicDrain.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:42:35 2017
Simulation stopped at Mon Jun 12 11:42:37 2017
Simulation elapsed time 1.56 (sec)

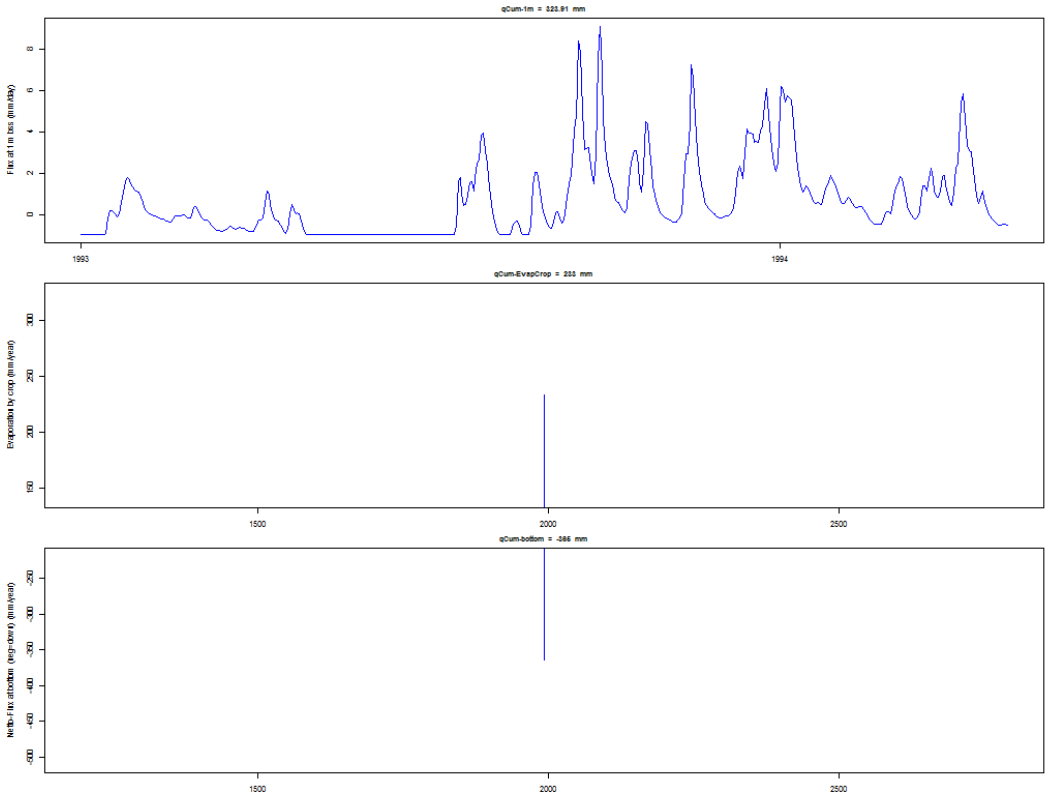
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 95: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 96: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	323.91			
2	qCum-EvapCrop	mm	233.00			
3	qCum-bottom	cm	-365.00			



Figuur 23: PearlDrainageBasic

Tabel 97: Waterbalans

	x
ipl	1
yr	1993
Igrai	898
Igsnow	0
Igirr	0
RunOn	0
fldrin1	0
fldrin2	0
fldrin3	0
flindr4	0
fldrin5	0
flbtin	365
evicpr	-13
evicir	0
evso	-290
evsubl	0
evpn	0
flev	-233
runoff	0
fldrou1	-9
fldrou2	-637
fldrou3	0
fldrou4	0
fldrou5	0
flbtou	0
deltast	-82
deltapn	0
deltasnow	0
badev	0
evsoma	-432
evtrma	-233

26 PearlFocus1(Joki-m)

Tabel 98: Description of case

	24
CaseNr	24
dirnam	PearlFocus1(Joki-m)
Purpose	frost conditions (at times below -20 deg C); winter crop
Location	Jokioinen-Finland
SimulationPeriod	1901-1966
SoilType	Loamy sand
CropType	Winter Cereals
drainage	no
irrigation	no
bottomboundary	q/h
reference	Focus (2000)

Project: Joki-m
File name: Joki-m.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:42:38 2017
Simulation stopped at Mon Jun 12 11:43:01 2017
Simulation elapsed time 22.64 (sec)

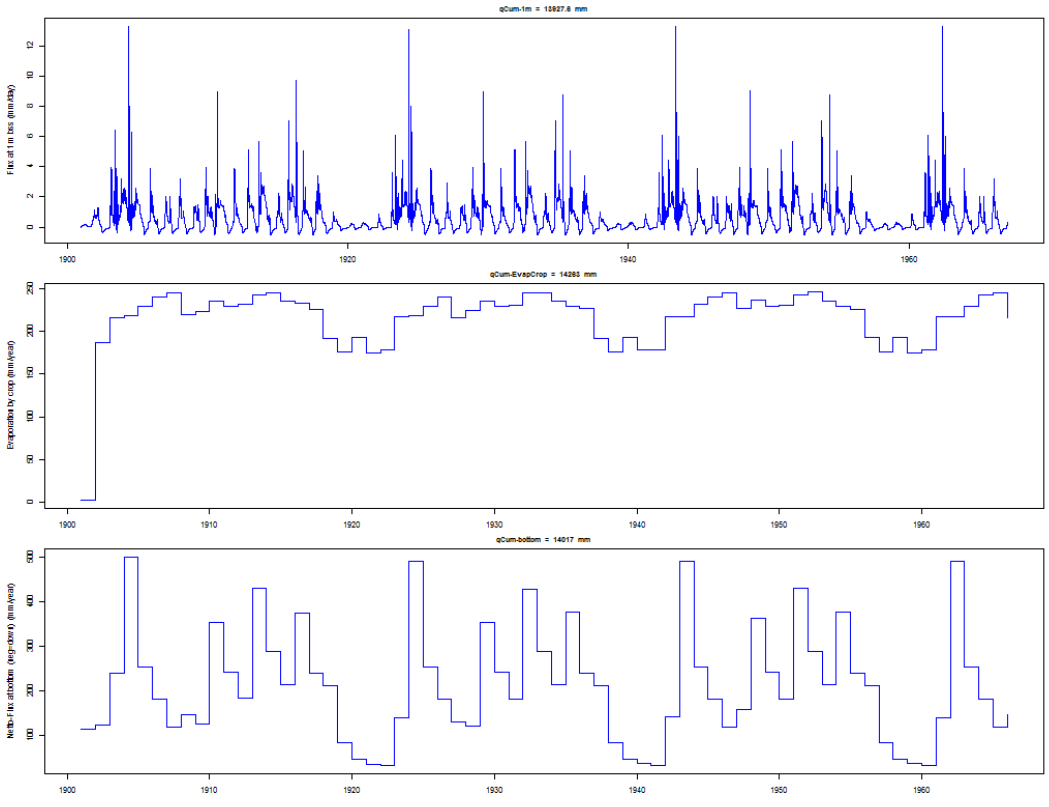
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 99: Iteration parameters

	variables	values	units
1	DTMIN	1e-07	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 100: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	13927.60			
2	qCum-EvapCrop	mm	14263.00			
3	qCum-bottom	cm	14017.00			



Figuur 24: PearlFocus1(Joki-m)

Tabel 101: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12	13
ipl	1	1	1	1	1	1	1	1	1	1	1	1	1
yr	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
Igrai	375	393	964	964	630	558	659	512	730	848	630	717	951
Igsnow	0	0	0	0	0	0	0	0	0	0	0	0	0
Igirr	0	0	0	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0	0	0	0
evicpr	0	0	0	0	0	0	0	0	0	0	0	0	0
evicir	0	0	0	0	0	0	0	0	0	0	0	0	0
evso	-255	-209	-242	-241	-235	-219	-270	-190	-242	-216	-235	-225	-234
evsubl	0	0	0	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0	0
flev	-2	-187	-216	-218	-230	-241	-245	-220	-223	-235	-230	-232	-243
runoff	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtou	-115	-124	-240	-501	-253	-181	-119	-147	-126	-354	-242	-183	-430
deltast	-4	125	-265	-4	89	83	-24	45	-138	-42	77	-78	-44
deltapn	0	0	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-604	-357	-312	-311	-325	-330	-363	-326	-302	-280	-325	-313	-310
evtrma	-2	-254	-217	-218	-251	-264	-275	-262	-245	-236	-251	-258	-243

27 PearlFocus2(Okeh-m)

Tabel 102: Description of case

	25
CaseNr	25
dirnam	PearlFocus2(Okeh-m)
Purpose	wet climate: annual rainfall 1040 mm, loamy soil
Location	Okehampton-UK
SimulationPeriod	1901-1966
SoilType	Loam
CropType	Grass
drainage	no
irrigation	no
bottomboundary	freedrainage
reference	Focus (2000)

Project: Okeh-m
File name: Okeh-m.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:43:02 2017
Simulation stopped at Mon Jun 12 11:43:32 2017
Simulation elapsed time 30.06 (sec)

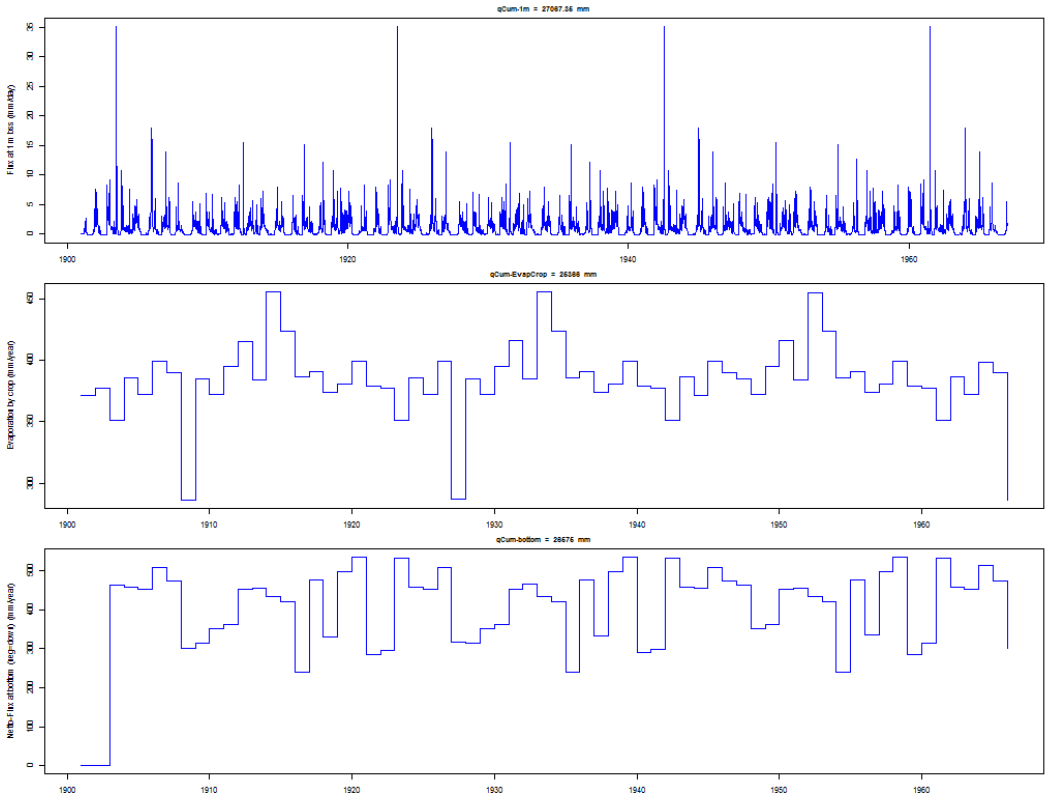
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 103: Iteration parameters

	variables	values	units
1	DTMIN	1e-07	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 104: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	27067.35			
2	qCum-EvapCrop	mm	25366.00			
3	qCum-bottom	cm	26575.00			



Figuur 25: PearlFocus2(Okeh-m)

Tabel 105: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12	13
ipl	1	1	1	1	1	1	1	1	1	1	1	1	1
yr	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
Igrai	938	1016	1113	1132	972	1158	1083	673	1056	899	1097	1104	1238
Igsnow	0	0	0	0	0	0	0	0	0	0	0	0	0
Igirr	0	0	0	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0	0	0	0
evicpr	0	0	0	0	0	0	0	0	0	0	0	0	0
evicir	0	0	0	0	0	0	0	0	0	0	0	0	0
evso	-226	-221	-199	-229	-231	-253	-241	-234	-252	-232	-256	-262	-245
evsubl	0	0	0	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0	0
flev	-371	-377	-351	-386	-372	-399	-390	-286	-385	-372	-395	-415	-384
runoff	0	0	0	0	0	0	0	0	-3	0	0	0	0
fldrou1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtou	0	0	-462	-456	-453	-508	-472	-301	-314	-352	-361	-451	-455
deltast	-341	-418	-101	-61	84	2	20	147	-102	58	-85	24	-153
deltapn	0	0	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-297	-298	-242	-276	-283	-299	-297	-333	-285	-266	-283	-305	-271
evtrma	-423	-423	-367	-395	-421	-446	-429	-513	-396	-377	-401	-432	-393

28 PearlFocus3(Port-m)

Tabel 106: Description of case

	26
CaseNr	26
dirnam	PearlFocus3(Port-m)
Purpose	very wet climate: annual rainfall 1150 mm; 2 crops per year
Location	Porto-Portugal
SimulationPeriod	1901-1966
SoilType	Loam
CropType	Cabbage; 2 crops per year
drainage	no
irrigation	no
bottomboundary	q/h
reference	Focus (2000)

Project: Port-m
File name: Port-m.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:43:34 2017
Simulation stopped at Mon Jun 12 11:44:02 2017
Simulation elapsed time 28.29 (sec)

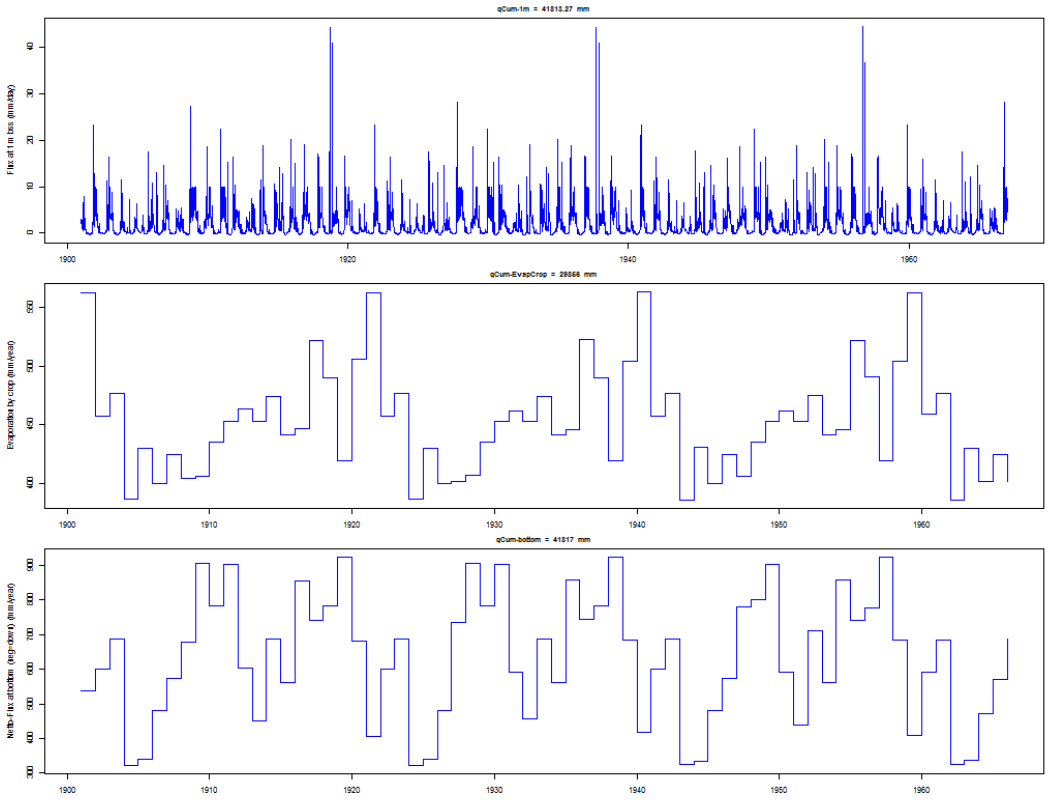
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 107: Iteration parameters

	variables	values	units
1	DTMIN	1e-07	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 108: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	41813.27			
2	qCum-EvapCrop	mm	29856.00			
3	qCum-bottom	cm	41817.00			



Figuur 26: PearlFocus3(Port-m)

Tabel 109: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12	13
ipl	1	1	1	1	1	1	1	1	1	1	1	1	1
yr	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
Igrai	1123	952	1073	661	864	923	924	1176	1563	1400	1404	1018	1110
Igsnow	0	0	0	0	0	0	0	0	0	0	0	0	0
Igirr	430	404	324	249	232	241	308	359	162	271	278	251	251
RunOn	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0	0	0	0
evicpr	0	0	0	0	0	0	0	0	0	0	0	0	0
evicir	0	0	0	0	0	0	0	0	0	0	0	0	0
evso	-377	-296	-330	-239	-280	-271	-295	-274	-293	-296	-297	-333	-267
evsubl	0	0	0	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0	0
flev	-563	-457	-477	-386	-430	-400	-424	-404	-406	-435	-453	-463	-453
runoff	-29	-9	-16	0	0	0	0	-18	-160	-76	-84	0	-7
fldrou1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtou	-537	-602	-687	-321	-339	-480	-574	-678	-905	-784	-902	-603	-450
deltast	-47	8	113	36	-47	-13	60	-161	40	-69	42	130	-172
deltapn	0	0	0	0	0	0	0	0	0	-11	11	0	-11
deltasnow	0	0	0	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-652	-515	-487	-445	-537	-426	-439	-452	-436	-462	-490	-491	-530
evtrma	-563	-459	-478	-387	-432	-401	-425	-418	-406	-436	-462	-463	-457

29 PearlFocus4(Sevi-m)

Tabel 110: Description of case

	27
CaseNr	27
dirnam	PearlFocus4(Sevi-m)
Purpose	irrigation; warm climate
Location	Sevilla-Spain
SimulationPeriod	1901-1966
SoilType	Silt loam
CropType	Apples
drainage	no
irrigation	fixed
bottomboundary	time dep gwl; gwl constant
reference	Focus (2000)

Project: Sevi-m
File name: Sevi-m.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:44:03 2017
Simulation stopped at Mon Jun 12 11:44:33 2017
Simulation elapsed time 29.75 (sec)

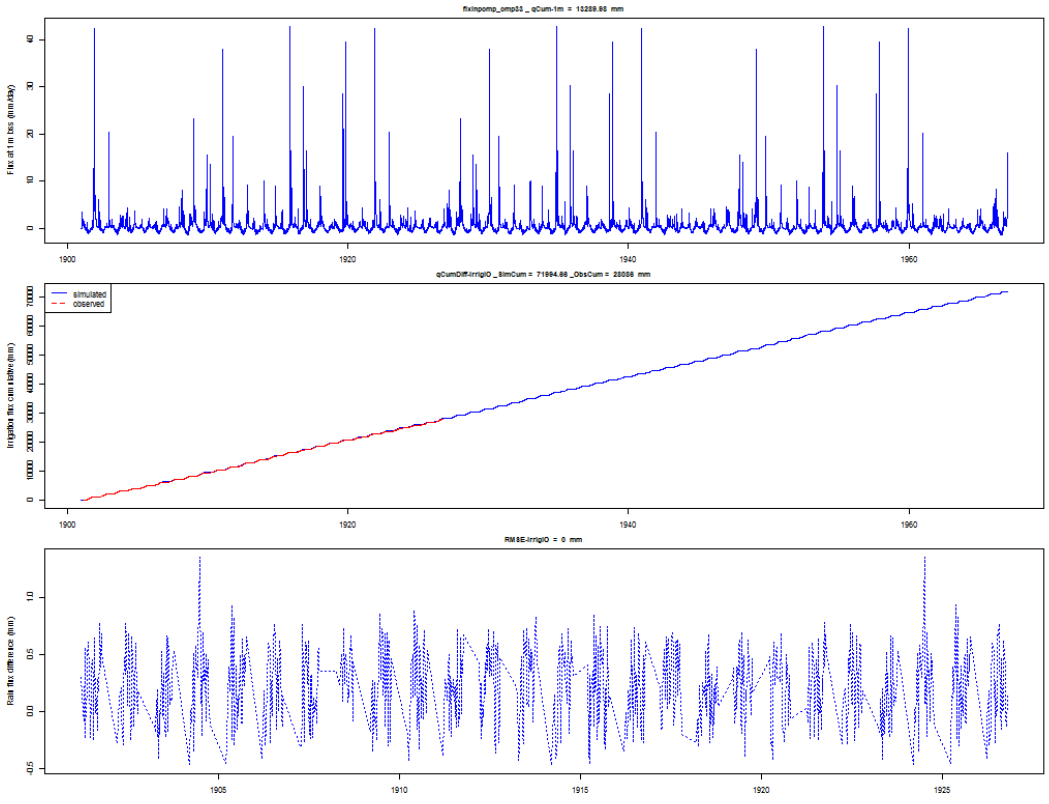
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 111: Iteration parameters

	variables	values	units
1	DTMIN	1e-07	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 112: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	13289.98			
2	qCumDiff-IrrigIO	mm	71994.66	28086.00	43908.66	
3	RMSE-IrrigIO	mm	14212.21	14134.18	0.00	0.00



Figuur 27: PearlFocus4(Sevi-m)

Tabel 113: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12
ipl	1	1	1	1	1	1	1	1	1	1	1	1
yr	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
Igrai	808	434	370	378	316	277	472	849	594	573	681	379
Igsnow	0	0	0	0	0	0	0	0	0	0	0	0
Igirr	1136	1009	1091	975	1010	1185	1015	974	1237	972	1136	1248
RunOn	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	58	36	55	38	47	67	49	76	71	51	69	81
evicpr	-14	-11	-11	-23	-24	-8	-16	-25	-6	-19	-17	-11
evicir	-34	-34	-34	-30	-32	-33	-36	-28	-34	-30	-34	-35
evso	-364	-296	-324	-263	-272	-294	-304	-312	-373	-294	-311	-316
evsubl	0	0	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0
flev	-1033	-885	-989	-937	-939	-1068	-954	-1088	-1114	-995	-1057	-1149
runoff	0	0	0	0	0	0	0	0	0	0	0	0
fldrou1	0	0	0	0	0	0	0	0	0	0	0	0
fldrou2	0	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0	0
flbtou	-429	-300	-198	-173	-110	-117	-181	-316	-497	-253	-529	-196
deltast	-130	46	40	33	4	-10	-47	-130	122	-4	63	0
deltapn	0	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-523	-438	-482	-469	-468	-467	-447	-454	-472	-459	-463	-491
evtrma	-1042	-891	-997	-943	-946	-1079	-961	-1100	-1125	-1003	-1068	-1162

30 PearlLysimeter

Tabel 114: Description of case

	28
CaseNr	28
dirnam	PearlLysimeter
Purpose	the seepage face option
Location	Landhorst
SimulationPeriod	1980-1982
SoilType	Sand
CropType	Maize
drainage	no
irrigation	no
bottomboundary	lysimeter
reference	Van den Berg (2006)

Project: Lysimeter
File name: Lysimeter.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:44:35 2017
Simulation stopped at Mon Jun 12 11:44:37 2017
Simulation elapsed time 1.71 (sec)

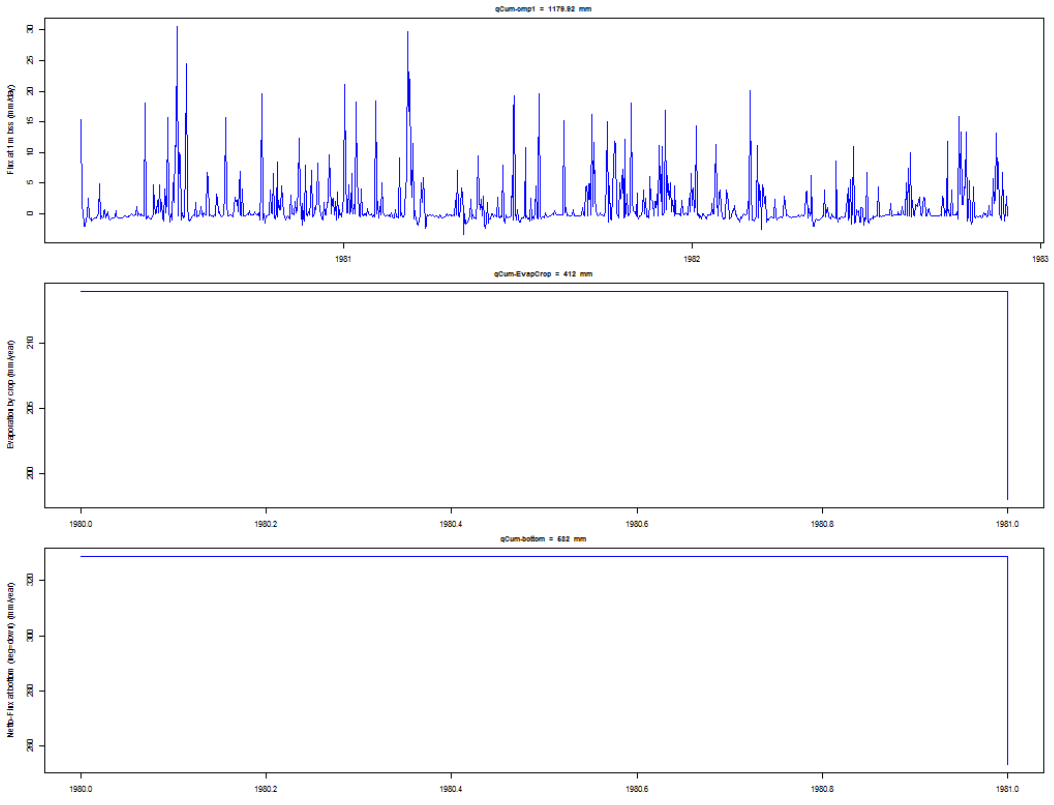
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 115: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 116: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-cmp1	mm	1179.92			
2	qCum-EvapCrop	mm	412.00			
3	qCum-bottom	cm	582.00			



Figuur 28: PearlLysimeter

Tabel 117: Waterbalans

	1	2
ipl	1	1
yr	1980	1981
Igrai	774	682
Igsnow	0	0
Igirr	0	0
RunOn	0	0
fldrin1	0	0
fldrin2	0	0
fldrin3	0	0
flindr4	0	0
fldrin5	0	0
flbtin	0	0
evicpr	0	0
evicir	0	0
evso	-231	-233
evsubl	0	0
evpn	0	0
flev	-214	-198
runoff	0	0
fldrou1	0	0
fldrou2	0	0
fldrou3	0	0
fldrou4	0	0
fldrou5	0	0
flbtou	-329	-253
deltast	0	2
deltapn	0	0
deltasnow	0	0
badev	0	0
evsoma	-402	-357
evtrma	-214	-198

31 ShallowSoil(EuroHarpITE)

Tabel 118: Description of case

	29
CaseNr	29
dirnam	ShallowSoil(EuroHarpITE)
Purpose	numerical performance
Location	Italy
SimulationPeriod	
SoilType	
CropType	alfalfa
drainage	
irrigation	
bottomboundary	
reference	Schoumans et al ()

Project: run.5212.2.swap
File name: run.5212.2.swap.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:44:38 2017
Simulation stopped at Mon Jun 12 11:44:42 2017
Simulation elapsed time 4.32 (sec)

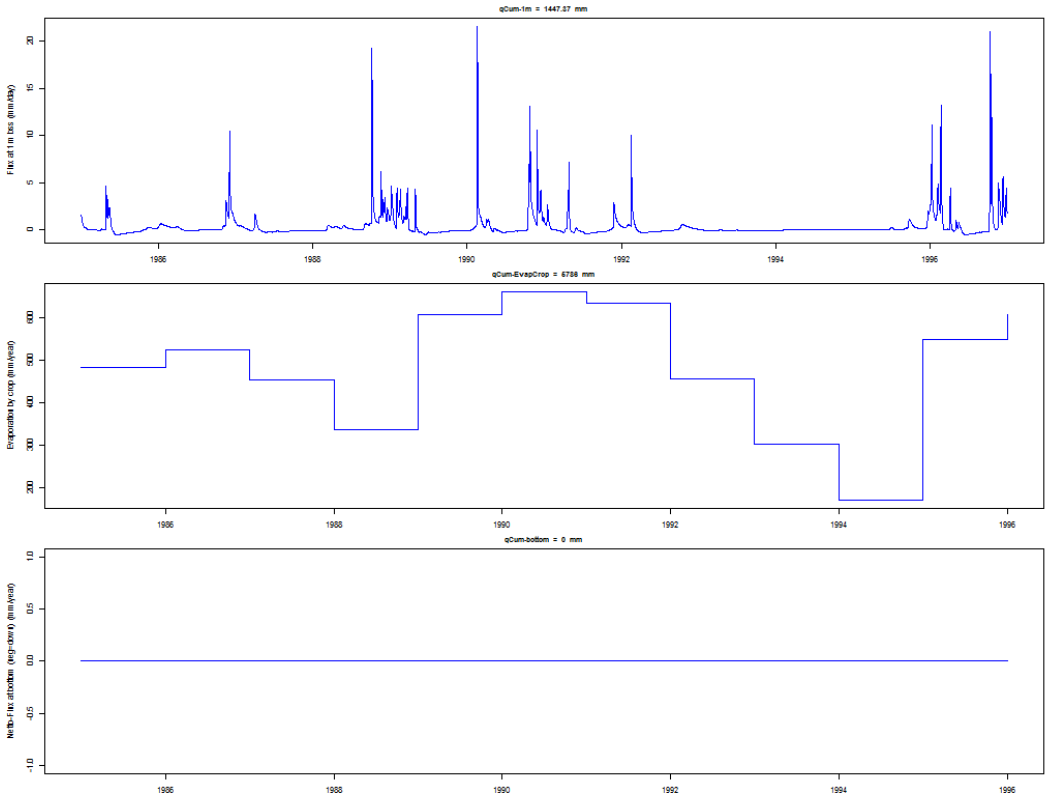
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 119: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	200	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 120: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	1447.37			
2	qCum-EvapCrop	mm	5786.00			
3	qCum-bottom	cm	0.00			



Figuur 29: ShallowSoil(EuroHarpITE)

Tabel 121: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12
ipl	1	1	1	1	1	1	1	1	1	1	1	1
yr	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Igrai	625	754	432	951	747	1242	753	624	302	276	974	1191
Igsnow	0	0	0	0	0	0	0	0	0	0	0	0
Igirr	0	0	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0	0	0
evicpr	-25	-65	-31	-40	-42	-103	-69	-40	-15	-33	-85	-94
evicir	0	0	0	0	0	0	0	0	0	0	0	0
evso	-195	-106	-142	-199	-164	-97	-102	-175	-134	-86	-120	-101
evsubl	0	0	0	0	0	0	0	0	0	0	0	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0
flev	-483	-524	-453	-337	-608	-662	-633	-456	-303	-170	-550	-607
runoff	-2	0	0	-2	0	-12	-9	-10	0	0	-9	-32
fldrou1	-72	0	0	-84	-213	-92	-69	0	0	0	0	-217
fldrou2	0	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0	0
flbtou	0	0	0	0	0	0	0	0	0	0	0	0
deltast	153	-59	194	-289	281	-276	128	56	150	13	-210	-140
deltapn	0	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	0	0	0	0	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-491	-218	-474	-613	-305	-218	-203	-462	-612	-305	-212	-207
evtrma	-498	-696	-484	-343	-669	-706	-692	-457	-356	-618	-695	-673

32 SnowFrost(Boreas)

Tabel 122: Description of case

	30
CaseNr	30
dirnam	SnowFrost(Boreas)
Purpose	snow storage, snow melt, soil temperatures, interception of rain and snow
Location	Canada
SimulationPeriod	
SoilType	
CropType	Boreas
drainage	
irrigation	
bottomboundary	
reference	-

Project: Boreas
File name: Boreas.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:44:43 2017
Simulation stopped at Mon Jun 12 11:44:45 2017
Simulation elapsed time 1.9 (sec)

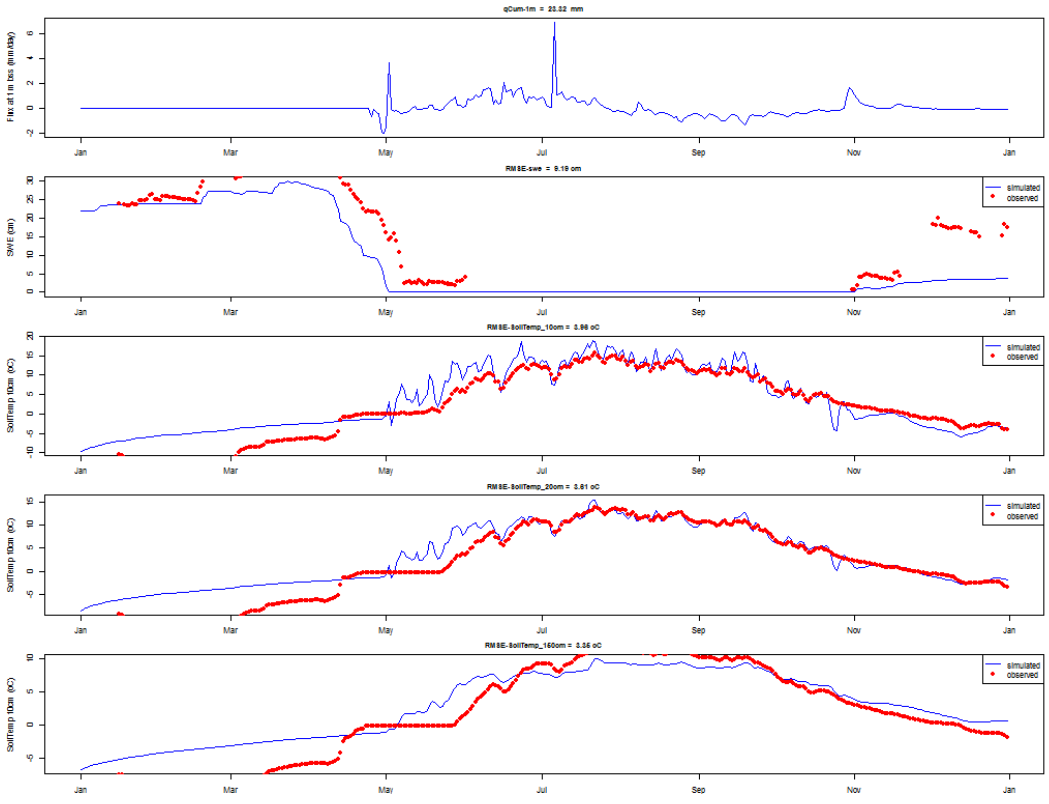
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 123: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	500	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 124: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	23.32			
2	RMSE-swe	cm	14.53	21.92	-7.39	9.19
3	RMSE-tem	oC	9.13	1.59	5.65	10.92



Figuur 30: SnowFrost(Boreas)

Tabel 125: Waterbalans

	x
ipl	1
yr	1994
Igrai	277
Igsnow	167
Igirr	0
RunOn	0
fldrin1	0
fldrin2	0
fldrin3	0
flindr4	0
fldrin5	0
flbtin	20
evicpr	-62
evicir	0
evso	-47
evsubl	-150
evpn	0
flev	-499
runoff	-144
fldrou1	0
fldrou2	0
fldrou3	0
fldrou4	0
fldrou5	0
flbtou	-78
deltast	334
deltapn	0
deltasnow	181
badev	0
evsoma	-105
evtrma	-589

33 SnowFrost(EuroHarpNOV)

Tabel 126: Description of case

	31
CaseNr	31
dirnam	SnowFrost(EuroHarpNOV)
Purpose	snow melt, surface runoff, related to thawing, drainage
Location	Norway
SimulationPeriod	
SoilType	
CropType	grass
drainage	
irrigation	
bottomboundary	
reference	Schoumans et al ()

Project: run.319.2.swap
File name: run.319.2.swap.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:44:46 2017
Simulation stopped at Mon Jun 12 11:44:55 2017
Simulation elapsed time 9.27 (sec)

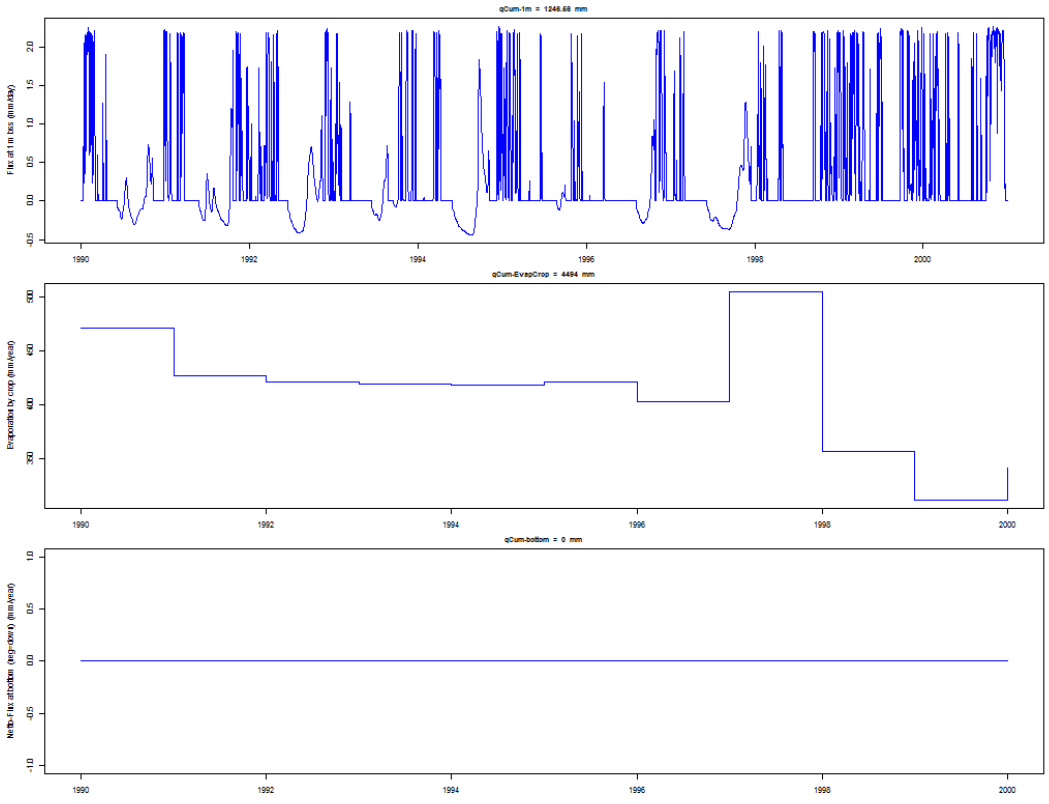
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 127: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	500	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 128: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	1246.56			
2	qCum-EvapCrop	mm	4494.00			
3	qCum-bottom	cm	0.00			



Figuur 31: SnowFrost(EuroHarpNOV)

Tabel 129: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11
ipl	1	1	1	1	1	1	1	1	1	1	1
yr	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Igrai	851	719	711	701	658	700	648	585	766	1062	1174
Igsnow	30	46	45	100	130	111	75	66	73	107	84
Igirr	0	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0	0
evicpr	0	0	0	0	0	0	0	0	0	0	0
evicir	0	0	0	0	0	0	0	0	0	0	0
evso	-70	-51	-66	-67	-53	-67	-62	-66	-76	-77	-79
evsubl	-1	-3	-1	-4	-7	-2	-6	-1	-5	-4	-2
evpn	0	0	0	0	0	0	0	0	0	0	0
flev	-471	-427	-421	-419	-418	-421	-403	-505	-357	-311	-341
runoff	-177	-93	-107	-139	-195	-136	-137	-73	-151	-356	-375
fldrou1	-191	-193	-160	-152	-132	-187	-107	-32	-235	-420	-437
fldrou2	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0
flbtou	0	0	0	0	0	0	0	0	0	0	0
deltast	1	1	-1	0	-2	3	0	28	-29	0	1
deltapn	2	1	0	-6	5	1	0	0	0	-1	1
deltasnow	27	0	0	-14	14	-2	-8	-2	13	0	-26
badev	0	0	0	0	0	0	0	0	0	0	0
evsoma	-112	-104	-107	-107	-112	-109	-100	-117	-97	-106	-106
evtrma	-506	-458	-481	-455	-493	-466	-440	-526	-413	-416	-425

34 SoilEvaporation(Castricum)

Tabel 130: Description of case

	32
CaseNr	32
dirnam	SoilEvaporation(Castricum)
Purpose	test of bare soil evaporation and drainage
Location	Castricum-NL
SimulationPeriod	1941-1970
SoilType	
CropType	BareSoil
drainage	
irrigation	
bottomboundary	
reference	Garcia ()

Project: BareSoil
File name: BareSoil.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:44:56 2017
Simulation stopped at Mon Jun 12 11:45:05 2017
Simulation elapsed time 8.34 (sec)

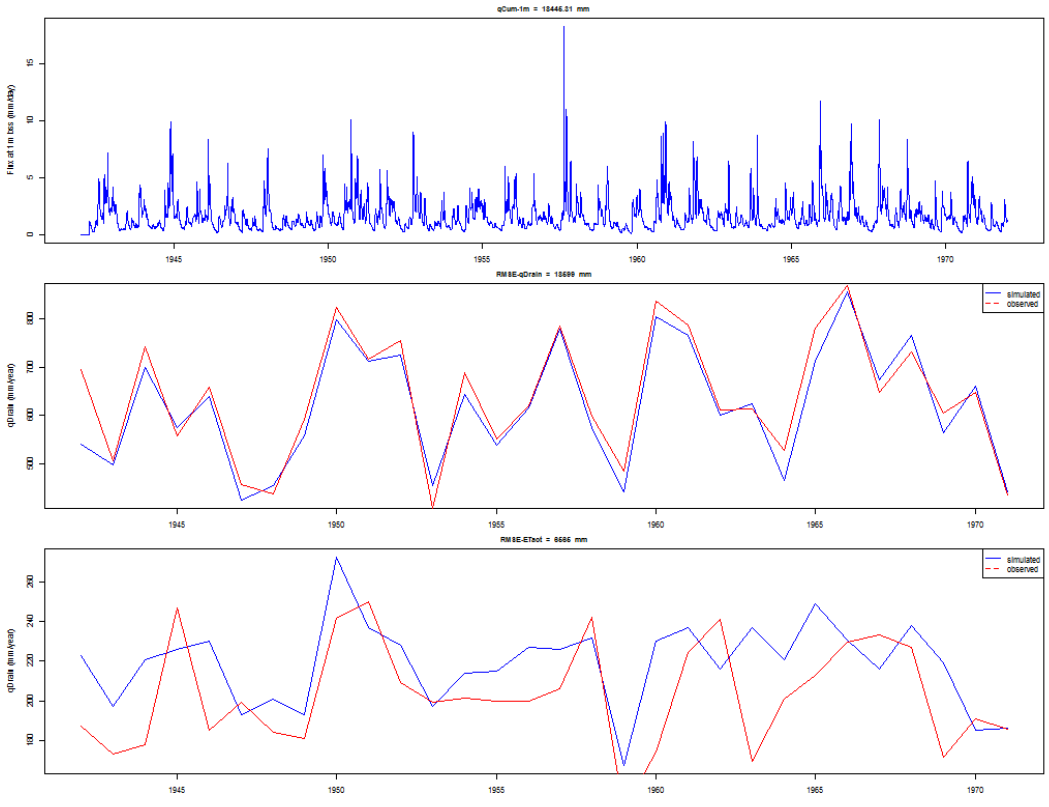
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 131: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	200	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 132: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	18445.31			
2	RMSE-qDrain	mm	18599.00	19160.29	-18.71	41.54
3	RMSE-ETact	mm	6565.00	6087.81	15.91	27.89



Figuur 32: SoilEvaporation(Castricum)

Tabel 133: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12	13
ipl	1	1	1	1	1	1	1	1	1	1	1	1	1
yr	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Igrai	841	672	916	783	827	567	618	771	1055	961	908	587	875
Igsnow	41	7	4	22	16	87	2	2	10	5	56	19	16
Igirr	0	0	0	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	0	0	0	0	0
evicpr	0	0	0	0	0	0	0	0	0	0	0	0	0
evicir	0	0	0	0	0	0	0	0	0	0	0	0	0
evso	-210	-197	-221	-225	-229	-174	-201	-193	-272	-237	-222	-195	-214
evsubl	-13	0	0	-1	-1	-19	0	0	-1	0	-6	-2	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0	0
flev	0	0	0	0	0	0	0	0	0	0	0	0	0
runoff	-8	0	0	0	0	-38	0	0	0	0	-28	-3	-2
fldrou1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtou	-532	-498	-699	-575	-639	-385	-454	-558	-798	-711	-698	-451	-642
deltast	-119	16	0	-3	26	-34	31	-22	7	-18	-11	44	-33
deltapn	0	0	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	-4	4	0	-1	1	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-653	-661	-633	-614	-648	-720	-664	-663	-638	-610	-630	-627	-575
evtrma	0	0	0	0	0	0	0	0	0	0	0	0	0

35 TimingErrorEndofDay

Tabel 134: Description of case

	33
CaseNr	33
dirnam	TimingErrorEndofDay
Purpose	convergence of numerical solution
Location	
SimulationPeriod	
SoilType	
CropType	PotatoS
drainage	
irrigation	
bottomboundary	
reference	Walvoort et al ()

Project: 1.swap
File name: 1.swap.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:45:06 2017
Simulation stopped at Mon Jun 12 11:45:08 2017
Simulation elapsed time 2.51 (sec)

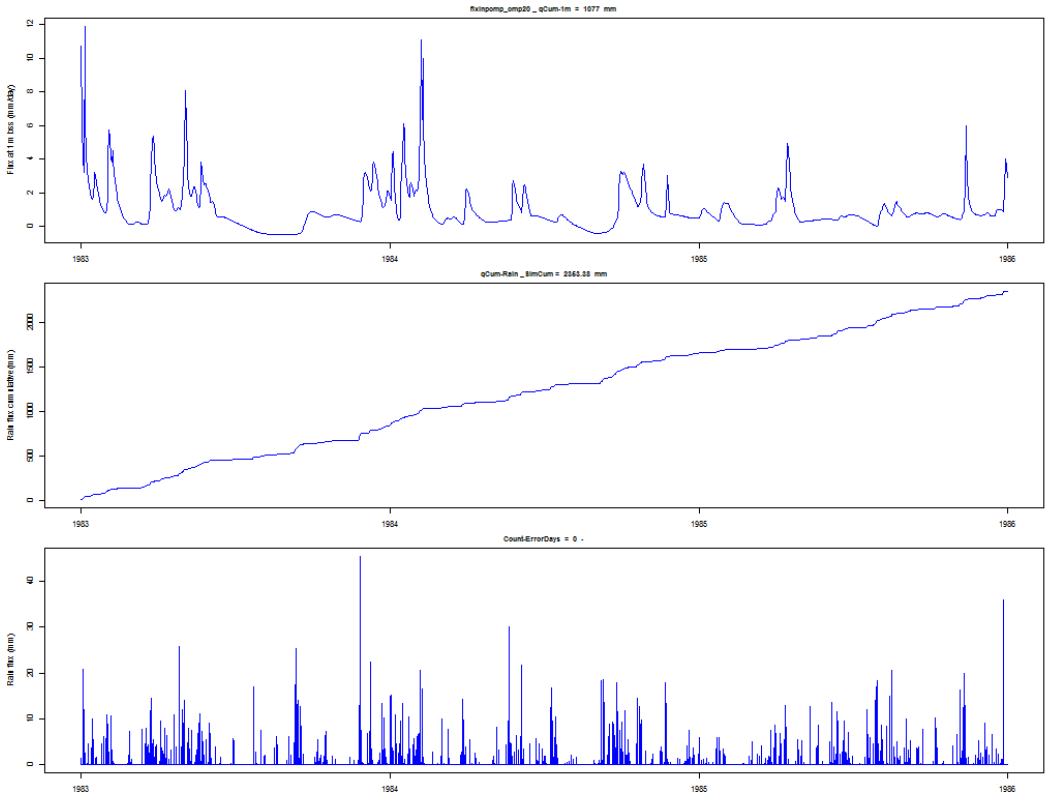
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 135: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 136: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	1077.00			
2	qCum-Rain	mm	2353.38			
3	Count-ErrorDays	-	0.00			



Figuur 33: TimingErrorEndofDay

Tabel 137: Waterbalans

	1	2	3
ipl	1	1	1
yr	1983	1984	1985
Igrai	829	821	703
Igsnow	0	0	0
Igirr	0	0	0
RunOn	0	0	0
fldrin1	0	0	0
fldrin2	0	0	0
fldrin3	0	0	0
flindr4	0	0	0
fldrin5	0	0	0
flbtin	22	22	22
evicpr	-16	-23	-39
evicir	0	0	0
evso	-187	-156	-154
evsubl	0	0	0
evpn	0	0	0
flev	-242	-220	-201
runoff	-19	-10	-18
fldrou1	-78	-99	-106
fldrou2	-287	-172	-90
fldrou3	0	0	0
fldrou4	0	0	0
fldrou5	0	0	0
flbtou	-109	-109	-109
deltast	88	-56	-7
deltapn	0	0	0
deltasnow	0	0	0
badev	0	0	0
evsoma	-250	-249	-255
evtrma	-290	-231	-219

36 TranspirationDecForest(Castricum)

Tabel 138: Description of case

CaseNr	
dirnam	TranspirationDecFores
Purpose	test of evaporation of deciduous forest and drainage, seasonal completely unsaturat
Location	C
SimulationPeriod	
SoilType	
CropType	
drainage	
irrigation	
bottomboundary	
reference	

Project: Oak
File name: Oak.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:45:09 2017
Simulation stopped at Mon Jun 12 11:45:20 2017
Simulation elapsed time 10.59 (sec)

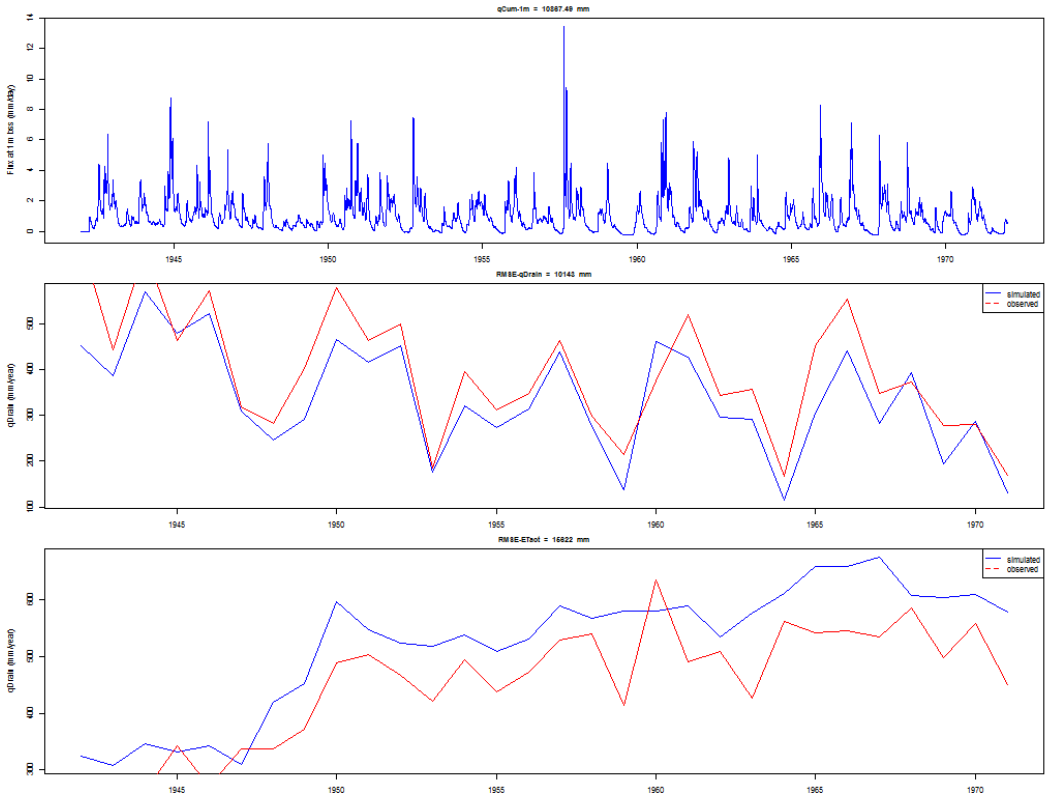
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 139: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	200	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 140: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	10867.49			
2	RMSE-qDrain	mm	10143.00	11784.00	-54.70	78.40
3	RMSE-ETact	mm	15622.00	13464.10	71.93	87.67



Figuur 34: TranspirationDecForest(Castricum)

Tabel 141: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12	13
ipl	1	1	1	1	1	1	1	1	1	1	1	1	1
yr	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Igrai	841	672	916	783	827	567	618	771	1055	961	908	587	875
Igsnow	41	7	4	22	16	87	2	2	10	5	56	19	16
Igirr	0	0	0	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	0	0	0	1	1	25	30	9
evicpr	-140	-146	-166	-155	-152	-117	-168	-192	-252	-240	-207	-168	-250
evicir	0	0	0	0	0	0	0	0	0	0	0	0	0
evso	-157	-141	-164	-162	-167	-128	-146	-135	-162	-141	-129	-133	-121
evsubl	-13	0	0	-1	-1	-17	0	0	-1	0	-5	-1	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0	0
flev	-14	-20	-17	-14	-22	-48	-105	-126	-181	-167	-183	-216	-167
runoff	-8	0	0	0	0	-30	0	0	0	0	-28	-5	-2
fldrou1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtou	-444	-386	-570	-479	-521	-279	-247	-292	-465	-416	-424	-171	-319
deltast	-106	13	-4	8	20	-32	41	-29	-5	-4	-13	57	-40
deltapn	0	0	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	-4	4	0	-1	1	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-526	-540	-505	-481	-484	-572	-459	-427	-339	-330	-353	-347	-296
evtrma	-15	-20	-17	-14	-23	-50	-105	-126	-190	-175	-192	-226	-176

37 TranspirationPineForest(Castricum)

Tabel 142: Description of case

CaseNr	
dirnam	TranspirationPineForest(Cas
Purpose	test of evaporation of pine forest and drainage, seasonal completely unsaturated soi
Location	Castri
SimulationPeriod	19
SoilType	
CropType	
drainage	
irrigation	
bottomboundary	
reference	G

Project: pinus
File name: pinus.swp
Model version: Swap 4.0.1

Simulation started at Mon Jun 12 11:45:21 2017
Simulation stopped at Mon Jun 12 11:45:32 2017
Simulation elapsed time 10.47 (sec)

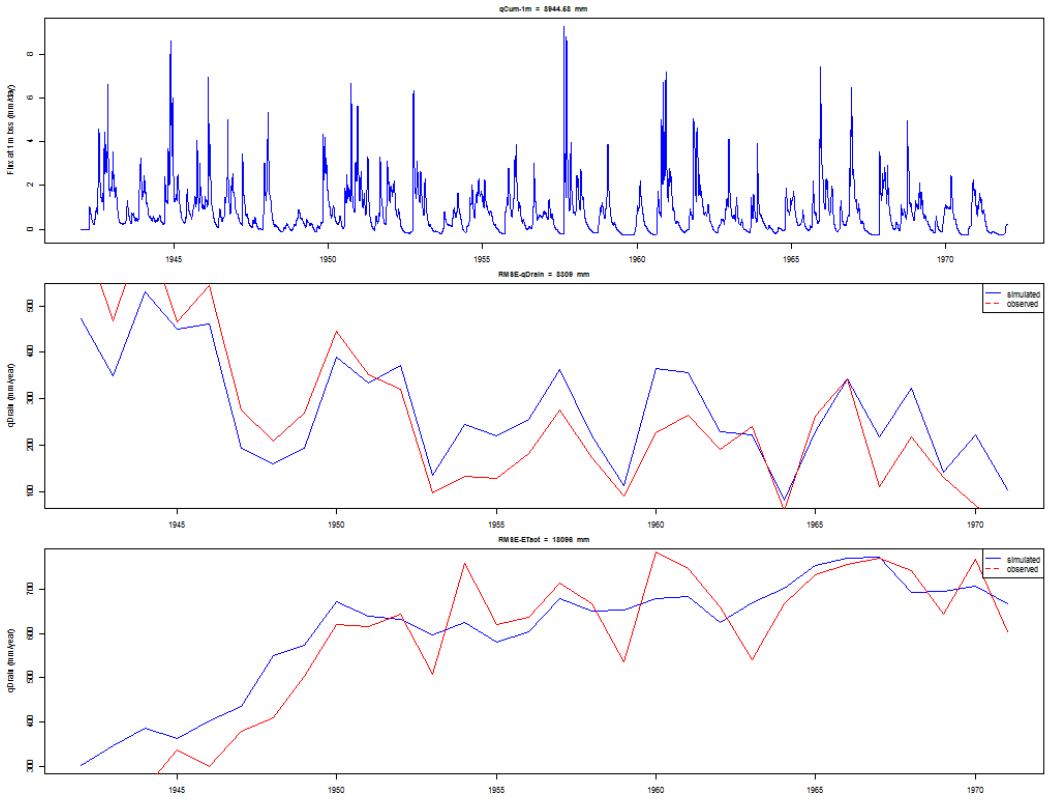
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 143: Iteration parameters

	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	200	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 144: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	8944.58			
2	RMSE-qDrain	mm	8309.00	7922.82	12.87	86.11
3	RMSE-ETact	mm	18096.00	17325.28	25.69	76.83



Figuur 35: TranspirationPineForest(Castricum)

Tabel 145: Waterbalans

	1	2	3	4	5	6	7	8	9	10	11	12	13
ipl	1	1	1	1	1	1	1	1	1	1	1	1	1
yr	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Igrai	841	672	916	783	827	567	618	771	1055	961	908	587	875
Igsnow	41	7	4	22	16	87	2	2	10	5	56	19	16
Igirr	0	0	0	0	0	0	0	0	0	0	0	0	0
RunOn	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin3	0	0	0	0	0	0	0	0	0	0	0	0	0
flindr4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrin5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtin	0	0	0	0	0	10	42	27	4	7	53	66	21
evicpr	-103	-147	-168	-157	-152	-137	-189	-211	-263	-271	-244	-192	-293
evicir	0	0	0	0	0	0	0	0	0	0	0	0	0
evso	-168	-140	-163	-162	-167	-116	-137	-127	-162	-138	-128	-128	-117
evsubl	-13	0	0	-1	-1	-15	0	0	-1	0	-6	-1	0
evpn	0	0	0	0	0	0	0	0	0	0	0	0	0
flev	-17	-59	-54	-42	-82	-168	-224	-235	-246	-230	-254	-276	-214
runoff	-8	0	0	0	0	-15	0	0	0	0	-27	-5	-2
fldrou1	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou2	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou3	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou4	0	0	0	0	0	0	0	0	0	0	0	0	0
fldrou5	0	0	0	0	0	0	0	0	0	0	0	0	0
flbtou	-464	-350	-531	-451	-462	-180	-160	-194	-390	-334	-346	-131	-243
deltast	-110	18	-4	8	20	-29	44	-33	-7	-1	-12	61	-43
deltapn	0	0	0	0	0	0	0	0	0	0	0	0	0
deltasnow	0	0	0	0	0	-4	4	0	-1	1	0	0	0
badev	0	0	0	0	0	0	0	0	0	0	0	0	0
evsoma	-546	-506	-475	-453	-450	-509	-379	-370	-330	-316	-335	-316	-270
evtrma	-18	-59	-54	-42	-83	-170	-235	-246	-258	-241	-267	-289	-226