Test cases Swap

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

14 mei 2008

Swap 3.2 (revision 11) (Date 14 May 2008)

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 3.2 (revision 11) (Date 14 May 2008)

Tabel 1: System info

	systeminfo
sysname	Windows
release	NT 5.1
version	(build 2600) Service Pack 2
nodename	L0106073
machine	x86
login	kroes006
user	kroes006

Tabel 2: Summary of results

	case	completed	watbalok	cpu.sec
1	AnalyticSoilPressurehead	yes	yes	7.14
2	AnalyticSoilTemperature	yes	yes	1.13
3	AnalyticSolute	yes	yes	12.51
4	AnimoForageMaize(Cranendonk)	yes	yes	3.70
5	AnimoGrassland(Cranendonk)	yes	yes	4.37
6	AnimoGrassland(Ruurlo)	yes	yes	2.50
7	DrainageBasic(EuroHarpDKO)	yes	yes	6.08
8	DrainageBasic(Hupsel)	yes	yes	2.43
9	DrainageExtended(STONE2uc6)	yes	yes	8.97
10	DrainageExtended(Timing)	yes	yes	0.66
11	DrainageExtended(Wildenborch)	yes	yes	4.43
12	GwlMeasuredasbottomBC(Ruurlo)	yes	yes	2.64
13	GwlShallow(Zegveld)	yes	yes	13.36
14	Hysterese(Hupsel)	yes	yes	2.83
15	InfiltrationRunoff(VanDamFeddes2000)	yes	yes	0.37
16	Interception(Speuld)	yes	yes	2.95
17	Interflow(Vlietpolder)	yes	yes	3.38
18	IrrigationScheduledFixedTiming(Sevilla)	yes	yes	34.17
19	MacroPores1	yes	yes	78.92
20	MacroPores2	yes	yes	4.44
21	MeteoDetailedInOut(Hupsel)	yes	yes	0.50
22	MeteoPrecipitationDetail(Andelst)	yes	yes	4.53
23	PearlDrainageBasic	yes	yes	1.08
24	PearlFocus1(Joki-m)	yes	yes	38.29
25	PearlFocus2(Okeh-m)	yes	yes	59.17
26	PearlFocus3(Port-m)	yes	yes	50.92
27	PearlFocus4(Sevi-m)	yes	yes	65.84
28	PearlLysimeter	yes	yes	1.89
29	ShallowSoil(EuroHarpITE)	yes	yes	6.72
30	SnowFrost(Boreas)	yes	yes	1.19
31	SnowFrost(EuroHarpNOV)	yes	yes	21.12
32	SoilEvaporation(Castricum)	yes	yes	17.71
33	TimingErrorEndofDay	yes	yes	2.31
34	TranspirationDecForest(Castricum)	yes	yes	19.26
35	total	34	34	487.51

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	0.16
3	RMSE-Ldis0.1cm	g/cm3	2.45	2.17	−0.28	2.66
4	qCum-1m	mm	2113.83			
5	qCum-1m	mm	1340.82			
6	qCum-1m	mm	982.35			
7	qCum-1m	mm	4876.77			
8	qCum-1m	mm	589.34			
9	qCum-1m	mm	−511.51			
10	qCum-1m	mm	700.82			
11	RMSE-GrndWatlev	m bss	−0.64	−0.58	−0.05	0.13
12	qCum-1m	mm	995.83			
13	qCum-1m	mm	802.91			
14	qCum-1m	mm	588.41			
15	qCum-1m	mm	1.56			
16	qCum-1m	mm	579.13			
17	qCum-1m	mm	157.91			
18	qCum-1m	mm	8602.94			
19	qCum-1m	mm	54.89			
20	qCum-1m	mm	−14.88			
21	qCumDiff-1m	mm	10.93	677.60	−1.84	3.50
22	qCum-1m	mm	397.07			
23	qCum-1m	mm	324.68			
24	qCum-1m	mm	17034.52			
25	qCum-1m	mm	27052.16			
26	qCum-1m	mm	38682.28			
27	qCum-1m	mm	40195.09			
28	qCum-cmp1	mm	1194.04			
29	qCum-1m	mm	1433.08			
30	qCum-1m	mm	24.41			
31	qCum-1m	mm	0.00			
32	qCum-1m	mm	18508.25			
33	qCum-1m	mm	1085.22			
34	qCum-1m	mm	12083.43			

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	20.00	20.00	−0.00	0.02
3	RMSE-Ldis1.0cm	g/cm3	2.00	2.00	0.00	0.07
4	qCum-EvapCrop	mm	2432.00			
5	qCum-EvapCrop	mm	3909.00			
6	qCum-EvapCrop	mm	1778.00			
7	qCum-EvapCrop	mm	2644.00			
8	qCum-EvapCrop	mm	823.00			
9	qCum-EvapCrop	mm	1020.00			
10	qCum-EvapCrop	mm	268.00			
11	RMSE-SurfWatLev	m bss	−0.74	−0.83		0.16
12	qCum-EvapCrop	mm	1829.00			
13	qCumDiff-RainIO	mm	9398.30	9398.30	0.00	
14	qCum-EvapCrop	mm	811.00			
15	qCum-cmp1	mm	21704.75			
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	20123.68	54587.20	−34463.52	
19	gwl-ave	cm bss	−107.23			
20	gwl-ave	cm bss	−93.29			
21	qCumDiff-Esoil	mm	40.22	2159.46	−5.64	8.44
22	qCumDiff-RainIO	mm	1395.35	1395.35	0.00	
23	qCum-EvapCrop	mm	225.00			
24	qCum-EvapCrop	mm	11091.00			
25	qCum-EvapCrop	mm	25349.00			
26	qCum-EvapCrop	mm	19867.00			
27	qCumDiff-IrrigIO	mm	54587.20	54587.20	0.00	
28	qCum-EvapCrop	mm	393.00			
29	qCum-EvapCrop	mm	5740.00			
30	RMSE-swe	cm	14.66	21.92	−7.26	9.03
31	qCum-EvapCrop	mm	3370.00			
32	RMSE-qDrain	mm	18633.00	19160.29	−17.58	39.70
33	qCum-Rain	mm	2353.37			
34	RMSE-qDrain	mm	11513.00	11784.00	−9.03	68.30

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	19.99	20.00	−0.01	0.03
3	RMSE-Ldis10.0cm	g/cm3	1.95	1.95	0.00	0.02
4	RMSE-gwl	cm	−128.62	−134.48	7.87	19.13
5	RMSE-gwl	cm	−111.63	−99.77	−8.28	14.48
6	RMSE-gwl	cm	−86.17	−104.14	3.53	22.26
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	−474.00			
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	34060.43			
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	9968.25	10233.89	0.00	0.00
19	qCum-bottom	mm	−24.00			
20	qCum-bottom	mm	17.67			
21	qCumDiff-Ecrop10cm	mm	21.24	1108.00	−2.92	3.76
22	RMSE-RainIO	mm	701.48	701.21	0.27	0.60
23	qCum-bottom	cm	−365.00			
24	qCum-bottom	cm	17095.00			
25	qCum-bottom	cm	26560.00			
26	qCum-bottom	cm	38684.00			
27	RMSE-IrrigIO	mm	27307.13	27307.13	0.00	0.00
28	qCum-bottom	cm	611.00			
29	qCum-bottom	cm	0.00			
30	RMSE-tem	oC	9.97	1.59	6.52	11.15
31	qCum-bottom	cm	0.00			
32	RMSE-ETact	mm	6527.00	6087.81	14.64	26.95
33	Count-ErrorDays	-	0.00			
34	RMSE-ETact	mm	13856.00	13464.10	13.06	55.12

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: SteadyStatecs
File name: SteadyStatecs.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:41:21 2008
Simulation stopped at Wed May 14 13:41:28 2008
Simulation elapsed time 7.14 (sec)

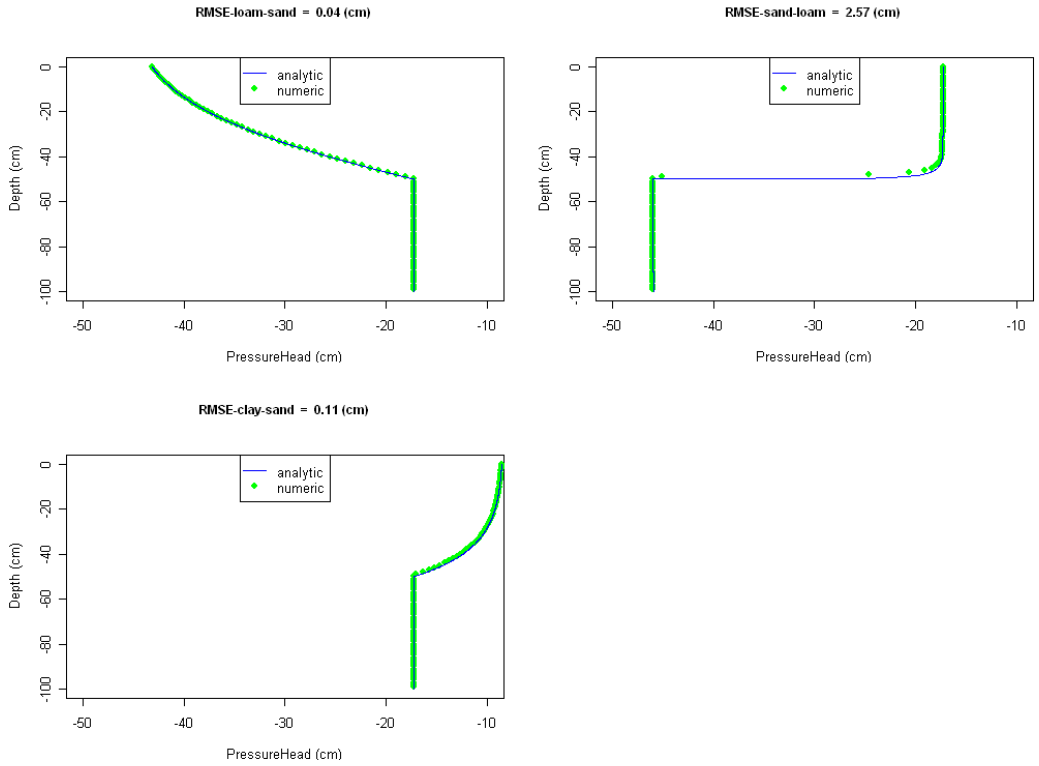
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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

	1
ipl	1.00
yr	1971.00
Igrai	1825.00
Igsnow	0.00
Igirr	0.00
RunOn	0.00
fldrin1	0.00
fldrin2	0.00
fldrin3	0.00
flindr4	0.00
fldrin5	0.00
flbtin	0.00
evicpr	0.00
evicir	0.00
evso	0.00
evsubl	0.00
evpn	0.00
flev	0.00
runoff	0.00
fldrou1	0.00
fldrou2	0.00
fldrou3	0.00
fldrou4	0.00
fldrou5	0.00
flbtou	−1730.00
deltast	−95.00
deltapn	0.00
deltasnow	0.00
badev	0.00
evsoma	0.00
evtrma	0.00

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:41:29 2008
Simulation stopped at Wed May 14 13:41:30 2008
Simulation elapsed time 1.13 (sec)

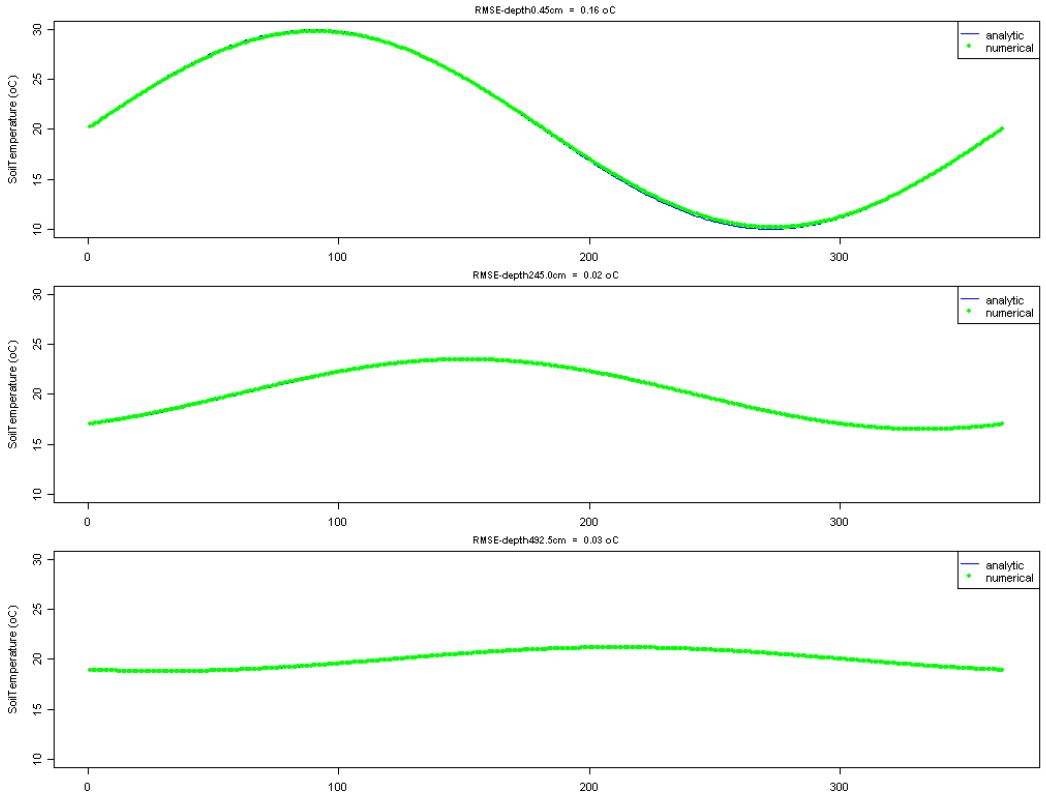
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	0.16
2	RMSE-depth245.0cm	oC	20.00	20.00	−0.00	0.02
3	RMSE-depth492.5cm	oC	19.99	20.00	−0.01	0.03



Figuur 2: AnalyticSoilTemperature

Tabel 13: Waterbalans

	1
ipl	1.00
yr	1971.00
Igrai	0.00
Igsnow	0.00
Igirr	0.00
RunOn	0.00
fldrin1	0.00
fldrin2	0.00
fldrin3	0.00
flindr4	0.00
fldrin5	0.00
flbtin	0.00
evicpr	0.00
evicir	0.00
evso	0.00
evsubl	0.00
evpn	0.00
flev	0.00
runoff	0.00
fldrou1	0.00
fldrou2	0.00
fldrou3	0.00
fldrou4	0.00
fldrou5	0.00
flbtou	0.00
deltast	0.00
deltapn	0.00
deltasnow	0.00
badev	0.00
evsoma	0.00
evtrma	0.00

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: solute3
File name: solute3.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:41:31 2008
Simulation stopped at Wed May 14 13:41:44 2008
Simulation elapsed time 12.51 (sec)

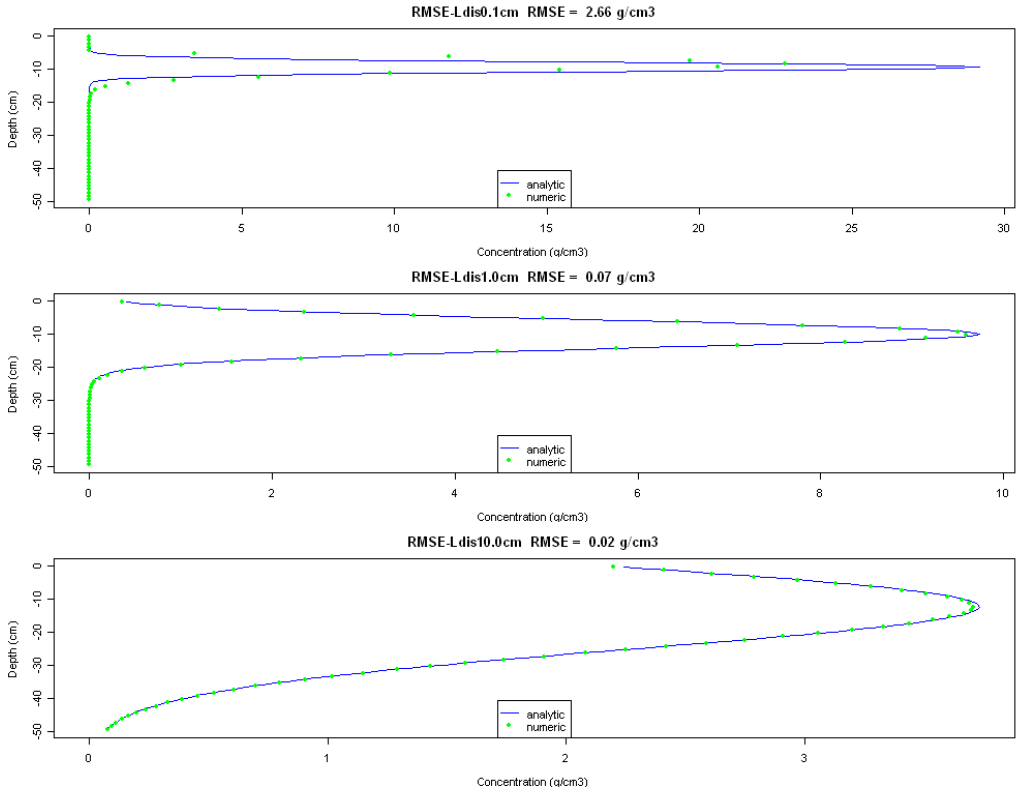
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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

	1
ipl	1.00
yr	1971.00
Igrai	364.00
Igsnow	0.00
Igirr	1.00
RunOn	0.00
fldrin1	0.00
fldrin2	0.00
fldrin3	0.00
flindr4	0.00
fldrin5	0.00
flbtin	0.00
evicpr	0.00
evicir	0.00
evso	0.00
evsubl	0.00
evpn	0.00
flev	0.00
runoff	0.00
fldrou1	0.00
fldrou2	0.00
fldrou3	0.00
fldrou4	0.00
fldrou5	0.00
flbtou	−364.00
deltast	−1.00
deltapn	0.00
deltasnow	0.00
badev	0.00
evsoma	0.00
evtrma	0.00

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:41:57 2008
Simulation stopped at Wed May 14 13:42:00 2008
Simulation elapsed time 3.7 (sec)

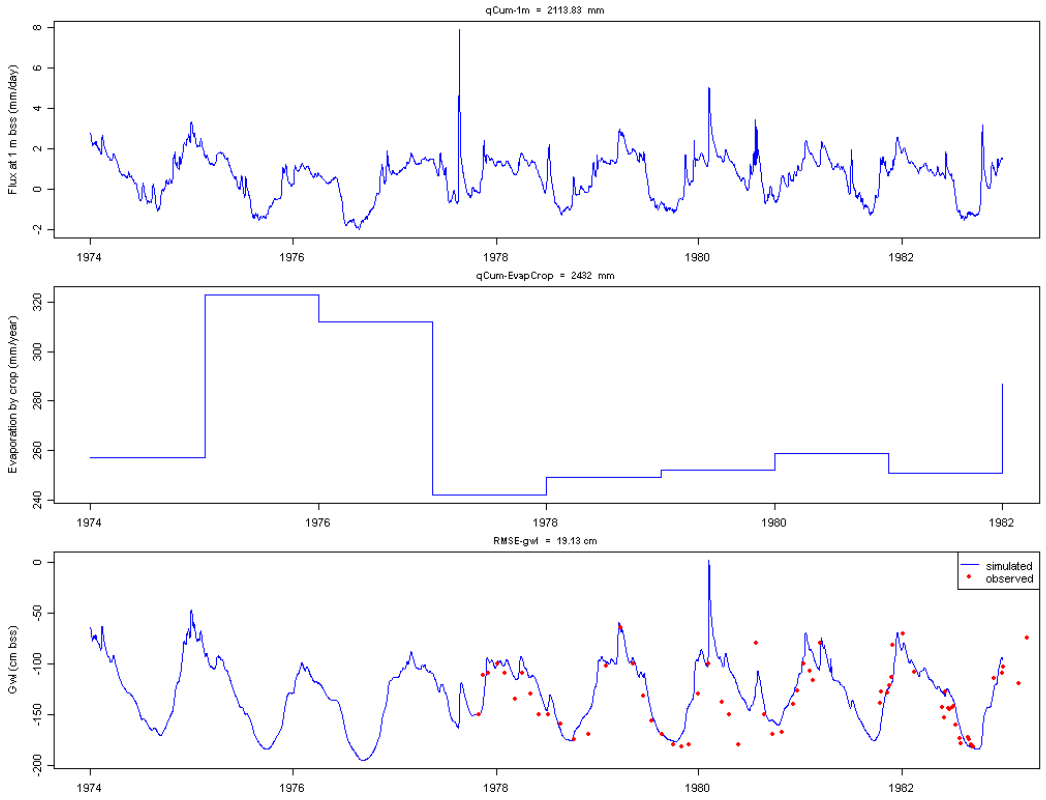
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	2113.83			
2	qCum-EvapCrop	mm	2432.00			
3	RMSE-gwl	cm	−128.62	−134.48	7.87	19.13



Figuur 4: AnimoForageMaize(Cranendonk)

Tabel 21: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1974.00	1975.00	1976.00	1977.00	1978.00	1979.00	1980.00	1981.00	1982.
Igrai	822.00	590.00	492.00	809.00	615.00	727.00	792.00	811.00	645.
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	30.00	112.00	169.00	6.00	67.00	83.00	13.00	43.00	82.
evicpr	−53.00	−31.00	−32.00	−37.00	−36.00	−36.00	−45.00	−44.00	−46.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−160.00	−166.00	−139.00	−157.00	−149.00	−171.00	−150.00	−157.00	−162.
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−257.00	−323.00	−312.00	−242.00	−249.00	−252.00	−259.00	−251.00	−287.
runoff	0.00	0.00	0.00	−10.00	0.00	0.00	−24.00	0.00	0.
fldrou1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	−365.00	−299.00	−149.00	−338.00	−244.00	−347.00	−360.00	−359.00	−257.
deltast	−16.00	118.00	−29.00	−31.00	−5.00	−4.00	32.00	−43.00	26.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	−296.00	−286.00	−323.00	−287.00	−275.00	−269.00	−291.00	−273.00	−313.
evtrma	−257.00	−324.00	−353.00	−242.00	−249.00	−253.00	−260.00	−251.00	−288.

7 AnimoGrassland(Cranendonk)

Tabel 22: Description of case

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

Project: CranGras
File name: CranGras.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:42:02 2008
Simulation stopped at Wed May 14 13:42:06 2008
Simulation elapsed time 4.37 (sec)

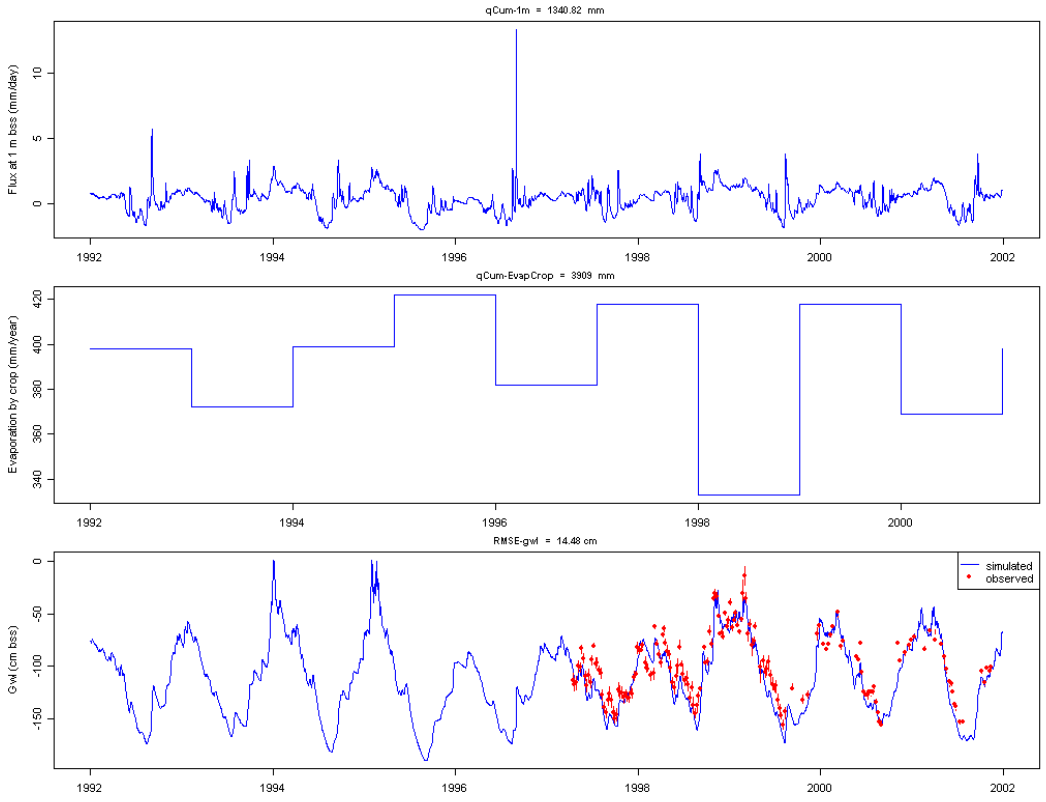
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	1340.82			
2	qCum-EvapCrop	mm	3909.00			
3	RMSE-gwl	cm	−111.63	−99.77	−8.28	14.48



Figuur 5: AnimoGrassland(Cranendonk)

Tabel 25: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1992.00	1993.00	1994.00	1995.00	1996.00	1997.00	1998.00	1999.00	2000.
Igrai	679.00	743.00	743.00	664.00	587.00	692.00	892.00	811.00	774.
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	336.00	319.00	284.00	349.00	386.00	336.00	220.00	291.00	255.
evicpr	−85.00	−89.00	−92.00	−90.00	−77.00	−84.00	−111.00	−100.00	−108.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−95.00	−81.00	−94.00	−83.00	−88.00	−101.00	−87.00	−97.00	−93.
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−398.00	−372.00	−399.00	−422.00	−382.00	−418.00	−333.00	−418.00	−369.
runoff	0.00	−1.00	−13.00	−15.00	0.00	0.00	0.00	0.00	0.
fldrou1	−441.00	−451.00	−482.00	−437.00	−404.00	−438.00	−532.00	−473.00	−501.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	0.00	0.00	−5.00	−7.00	0.00	0.00	−10.00	0.00	0.
deltast	3.00	−60.00	51.00	41.00	−24.00	14.00	−38.00	−14.00	42.
deltapn	0.00	−7.00	7.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	−106.00	−99.00	−107.00	−113.00	−100.00	−110.00	−96.00	−112.00	−103.
evtrma	−398.00	−372.00	−400.00	−428.00	−382.00	−418.00	−334.00	−420.00	−369.

8 AnimoGrassland(Ruurlo)

Tabel 26: Description of case

	6
CaseNr	6
dirnam	AnimoGrassland(Ruurlo)
Purpose	waterbalans terms distribution
Location	Ruurlo-NL
SimulationPeriod	
SoilType	
CropType	
drainage	
irrigation	
bottomboundary	
reference	Renaud et al ()

Project: RuurloGras
File name: RuurloGras.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:42:08 2008
Simulation stopped at Wed May 14 13:42:10 2008
Simulation elapsed time 2.5 (sec)

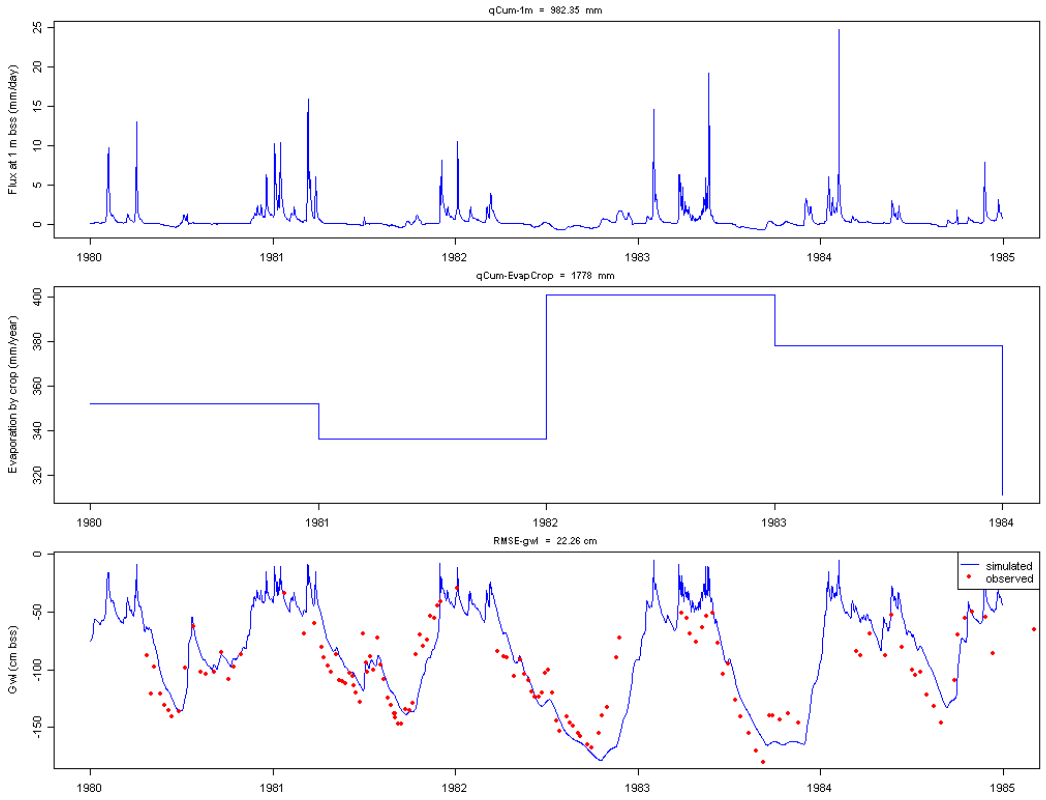
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	982.35			
2	qCum-EvapCrop	mm	1778.00			
3	RMSE-gwl	cm	−86.17	−104.14	3.53	22.26



Figuur 6: AnimoGrassland(Ruurlo)

Tabel 29: Waterbalans

	1	2	3	4	5
ipl	1.00	1.00	1.00	1.00	1.00
yr	1980.00	1981.00	1982.00	1983.00	1984.00
Igrai	743.00	805.00	616.00	763.00	744.00
Igsnow	0.00	0.00	0.00	0.00	0.00
Igirr	0.00	0.00	0.00	0.00	0.00
RunOn	0.00	0.00	0.00	0.00	0.00
fldrin1	0.00	0.00	0.00	0.00	0.00
fldrin2	0.00	0.00	0.00	0.00	0.00
fldrin3	0.00	0.00	0.00	0.00	0.00
flindr4	0.00	0.00	0.00	0.00	0.00
fldrin5	0.00	0.00	0.00	0.00	0.00
flbtin	0.00	0.00	0.00	0.00	0.00
evicpr	−95.00	−100.00	−85.00	−66.00	−73.00
evicir	0.00	0.00	0.00	0.00	0.00
evso	−88.00	−87.00	−90.00	−92.00	−78.00
evsubl	0.00	0.00	0.00	0.00	0.00
evpn	0.00	0.00	0.00	0.00	0.00
flev	−352.00	−336.00	−401.00	−378.00	−311.00
runoff	0.00	0.00	0.00	0.00	0.00
fldrou1	−20.00	−29.00	−13.00	−24.00	−26.00
fldrou2	0.00	0.00	0.00	0.00	0.00
fldrou3	0.00	0.00	0.00	0.00	0.00
fldrou4	0.00	0.00	0.00	0.00	0.00
fldrou5	0.00	0.00	0.00	0.00	0.00
flbtou	−153.00	−251.00	−85.00	−202.00	−203.00
deltast	−35.00	−3.00	58.00	−1.00	−53.00
deltapn	0.00	0.00	0.00	0.00	0.00
deltasnow	0.00	0.00	0.00	0.00	0.00
badev	0.00	0.00	0.00	0.00	0.00
evsoma	−98.00	−96.00	−108.00	−104.00	−85.00
evtrma	−359.00	−344.00	−410.00	−409.00	−322.00

9 DrainageBasic(EuroHarpDKO)

Tabel 30: Description of case

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

Project: run.11111.2.swap
File name: run.11111.2.swap.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:42:11 2008
Simulation stopped at Wed May 14 13:42:17 2008
Simulation elapsed time 6.08 (sec)

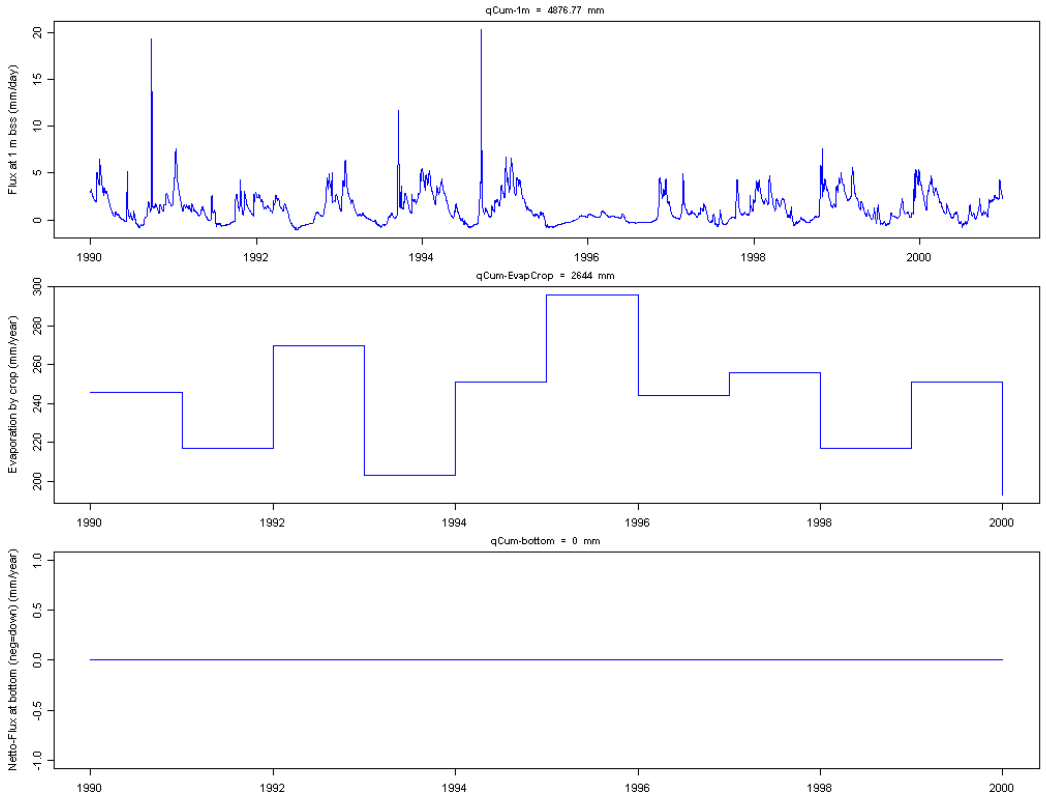
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	4876.77			
2	qCum-EvapCrop	mm	2644.00			
3	qCum-bottom	cm	0.00			



Figuur 7: DrainageBasic(EuroHarpDKO)

Tabel 33: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1990.00	1991.00	1992.00	1993.00	1994.00	1995.00	1996.00	1997.00	1998.
Igrai	963.00	776.00	785.00	924.00	1070.00	743.00	577.00	722.00	1001.
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	−26.00	−21.00	−26.00	−38.00	−21.00	−13.00	−20.00	−19.00	−29.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−175.00	−164.00	−165.00	−136.00	−184.00	−192.00	−134.00	−192.00	−177.
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−246.00	−217.00	−270.00	−203.00	−251.00	−296.00	−244.00	−256.00	−217.
runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou1	−93.00	−91.00	−88.00	−92.00	−94.00	−86.00	−73.00	−89.00	−93.
fldrou2	−423.00	−302.00	−261.00	−383.00	−528.00	−392.00	0.00	−83.00	−465.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltast	0.00	20.00	24.00	−72.00	6.00	237.00	−106.00	−84.00	−20.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	−343.00	−337.00	−342.00	−313.00	−344.00	−319.00	−310.00	−368.00	−299.
evtrma	−246.00	−220.00	−272.00	−203.00	−251.00	−301.00	−247.00	−257.00	−217.

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:42:19 2008
Simulation stopped at Wed May 14 13:42:22 2008
Simulation elapsed time 2.43 (sec)

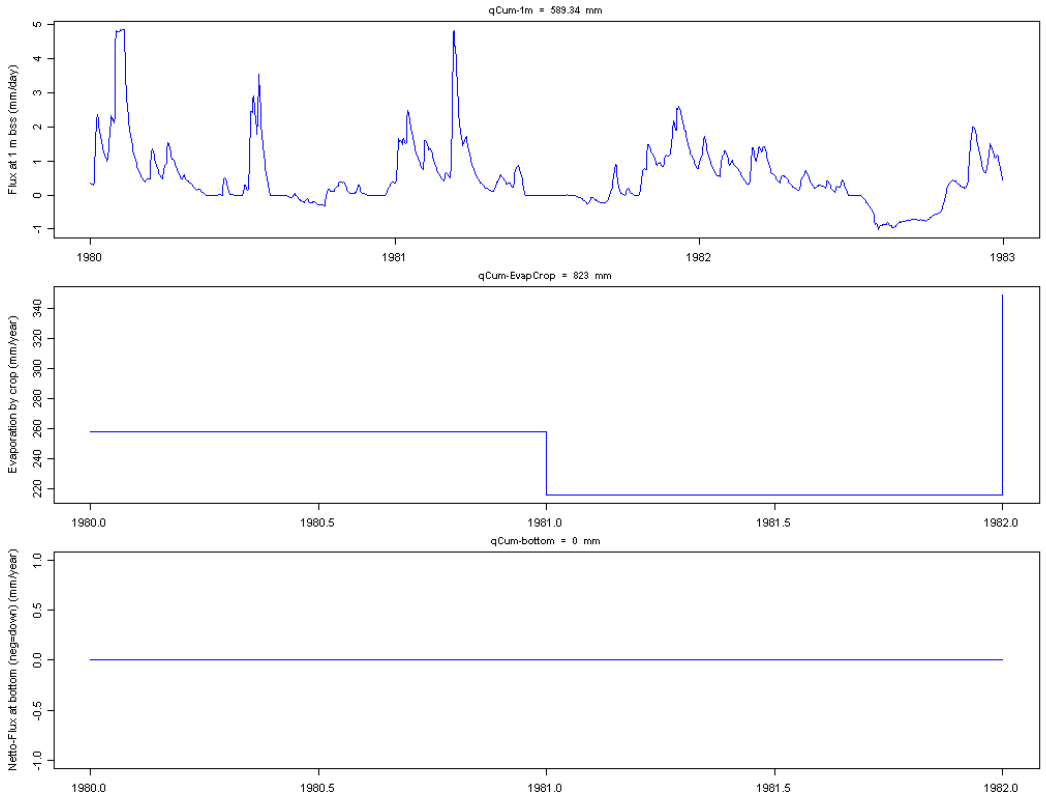
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	589.34			
2	qCum-EvapCrop	mm	823.00			
3	qCum-bottom	cm	0.00			



Figuur 8: DrainageBasic(Hupsel)

Tabel 37: Waterbalans

	1	2	3
ipl	1.00	1.00	1.00
yr	1980.00	1981.00	1982.00
Igrai	564.00	775.00	566.00
Igsnow	13.00	24.00	1.00
Igirr	1.00	0.00	0.00
RunOn	0.00	0.00	0.00
fldrin1	0.00	0.00	0.00
fldrin2	0.00	0.00	0.00
fldrin3	0.00	0.00	0.00
flindr4	0.00	0.00	0.00
fldrin5	0.00	0.00	0.00
flbtin	0.00	0.00	0.00
evicpr	−45.00	−14.00	−41.00
evicir	0.00	0.00	0.00
evso	−136.00	−173.00	−158.00
evsubl	−6.00	0.00	0.00
evpn	0.00	0.00	0.00
flev	−258.00	−216.00	−349.00
runoff	−78.00	−9.00	0.00
fldrou1	−356.00	−371.00	−153.00
fldrou2	0.00	0.00	0.00
fldrou3	0.00	0.00	0.00
fldrou4	0.00	0.00	0.00
fldrou5	0.00	0.00	0.00
flbtou	0.00	0.00	0.00
deltast	−1.00	−16.00	134.00
deltapn	0.00	0.00	0.00
deltasnow	220.00	0.00	0.00
badev	−83.00	0.00	0.00
evsoma	−340.00	−317.00	−342.00
evtrma	−296.00	−216.00	−353.00

11 DrainageExtended(STONE2uc6)

Tabel 38: Description of case

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

Project: Stoneuc6
File name: Stoneuc6.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:42:23 2008
Simulation stopped at Wed May 14 13:42:32 2008
Simulation elapsed time 8.97 (sec)

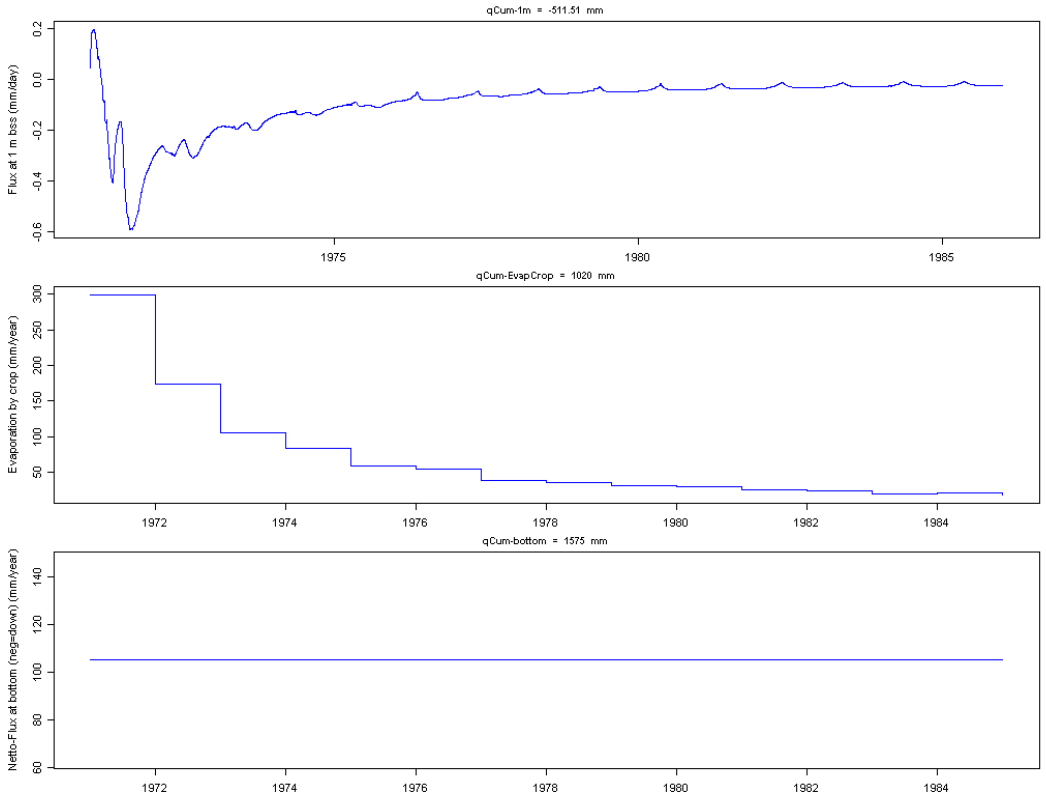
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	−511.51			
2	qCum-EvapCrop	mm	1020.00			
3	qCum-bottom	cm	1575.00			



Figuur 9: DrainageExtended(STONE2uc6)

Tabel 41: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1971.00	1972.00	1973.00	1974.00	1975.00	1976.00	1977.00	1978.00	1979.
Igrai	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igsnow	599.00	740.00	793.00	824.00	695.00	588.00	789.00	712.00	874.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsubl	−207.00	−222.00	−232.00	−234.00	−231.00	−267.00	−223.00	−216.00	−207.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−299.00	−174.00	−106.00	−84.00	−59.00	−55.00	−39.00	−35.00	−31.
runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou1	−2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	−105.00	−105.00	−105.00	−105.00	−105.00	−105.00	−105.00	−105.00	−105.
deltast	405.00	279.00	211.00	189.00	164.00	161.00	145.00	140.00	136.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	−392.00	−518.00	−561.00	−590.00	−464.00	−321.00	−566.00	−496.00	−667.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evtrma	−364.00	−340.00	−340.00	−349.00	−373.00	−394.00	−312.00	−313.00	−304.

12 DrainageExtended(Timing)

Tabel 42: Description of case

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

Project: swap
File name: swap.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:42:34 2008
Simulation stopped at Wed May 14 13:42:34 2008
Simulation elapsed time 0.66 (sec)

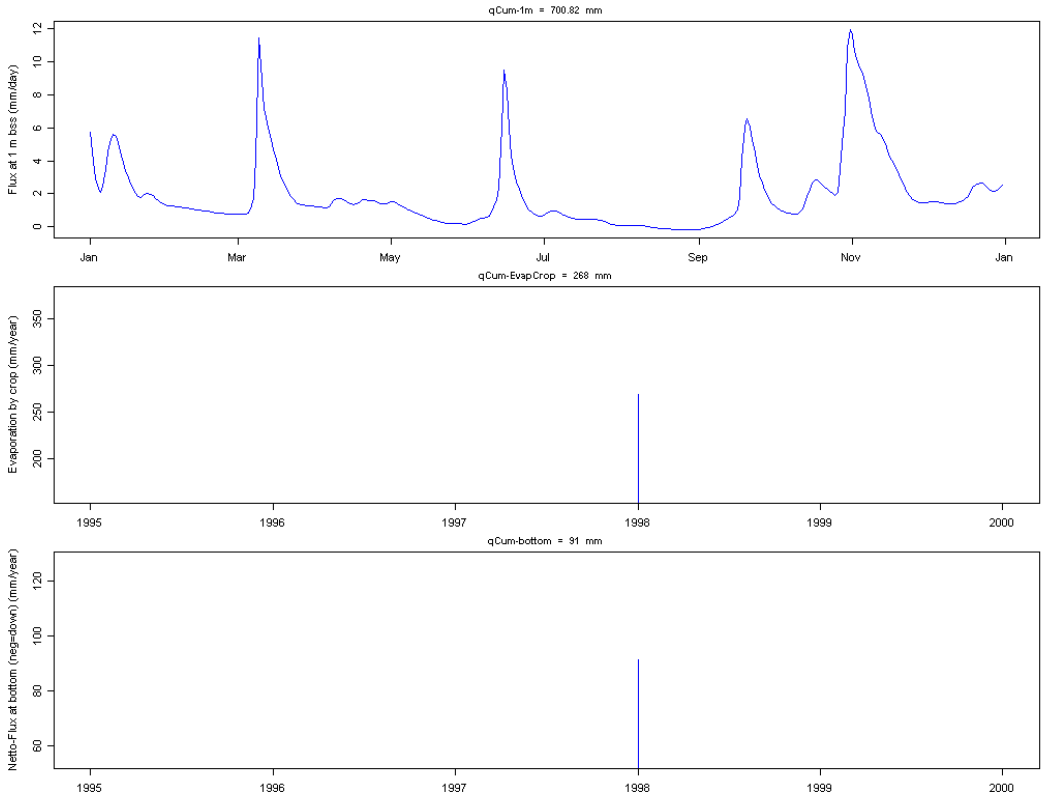
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	700.82			
2	qCum-EvapCrop	mm	268.00			
3	qCum-bottom	cm	91.00			



Figuur 10: DrainageExtended(Timing)

Tabel 45: Waterbalans

	1
ipl	1.00
yr	1998.00
Igrai	1185.00
Igsnow	0.00
Igirr	0.00
RunOn	0.00
fldrin1	0.00
fldrin2	0.00
fldrin3	0.00
flindr4	0.00
fldrin5	0.00
flbtin	0.00
evicpr	−52.00
evicir	0.00
evso	−163.00
evsubl	0.00
evpn	0.00
flev	−268.00
runoff	0.00
fldrou1	−156.00
fldrou2	−257.00
fldrou3	−201.00
fldrou4	0.00
fldrou5	0.00
flbtou	−91.00
deltast	4.00
deltapn	0.00
deltasnow	0.00
badev	0.00
evsoma	−241.00
evtrma	−268.00

13 DrainageExtended(Wildenborch)

Tabel 46: Description of case

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

Project: Wildenborch
File name: Wildenborch.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:42:36 2008
Simulation stopped at Wed May 14 13:42:40 2008
Simulation elapsed time 4.43 (sec)

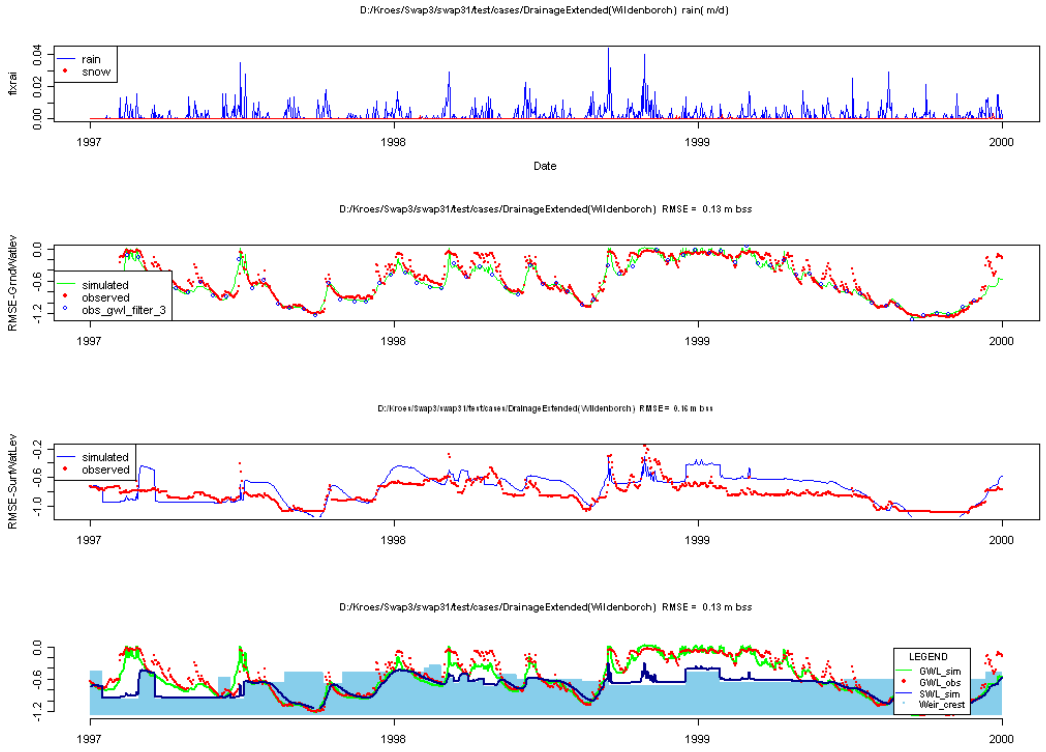
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	−474.00			



Figuur 11: DrainageExtended(Wildenborch)

Tabel 49: Waterbalans

	1	2	3
ipl	1.00	1.00	1.00
yr	1997.00	1998.00	1999.00
Igrai	674.00	1036.00	761.00
Igsnow	1.00	9.00	13.00
Igirr	0.00	0.00	0.00
RunOn	0.00	0.00	0.00
fldrin1	4.00	5.00	5.00
fldrin2	0.00	1.00	2.00
fldrin3	0.00	0.00	0.00
flindr4	0.00	0.00	0.00
fldrin5	0.00	0.00	0.00
flbtin	319.00	225.00	173.00
evicpr	−84.00	−110.00	−100.00
evicir	0.00	0.00	0.00
evso	−92.00	−84.00	−98.00
evsubl	0.00	−1.00	−1.00
evpn	0.00	0.00	0.00
flev	−399.00	−315.00	−405.00
runoff	−18.00	−212.00	−31.00
fldrou1	−74.00	−115.00	−83.00
fldrou2	−25.00	−101.00	−76.00
fldrou3	0.00	0.00	0.00
fldrou4	0.00	0.00	0.00
fldrou5	0.00	0.00	0.00
flbtou	−275.00	−324.00	−213.00
deltast	−32.00	−20.00	34.00
deltapn	0.00	0.00	0.00
deltasnow	0.00	0.00	0.00
badev	0.00	−8.00	−18.00
evsoma	−108.00	−93.00	−111.00
evtrma	−406.00	−326.00	−415.00

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	
SoilType	
CropType	
drainage	
irrigation	
bottomboundary	
reference	Renaud et al ()

Project: RuurloGras
File name: RuurloGras.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:42:42 2008
Simulation stopped at Wed May 14 13:42:45 2008
Simulation elapsed time 2.64 (sec)

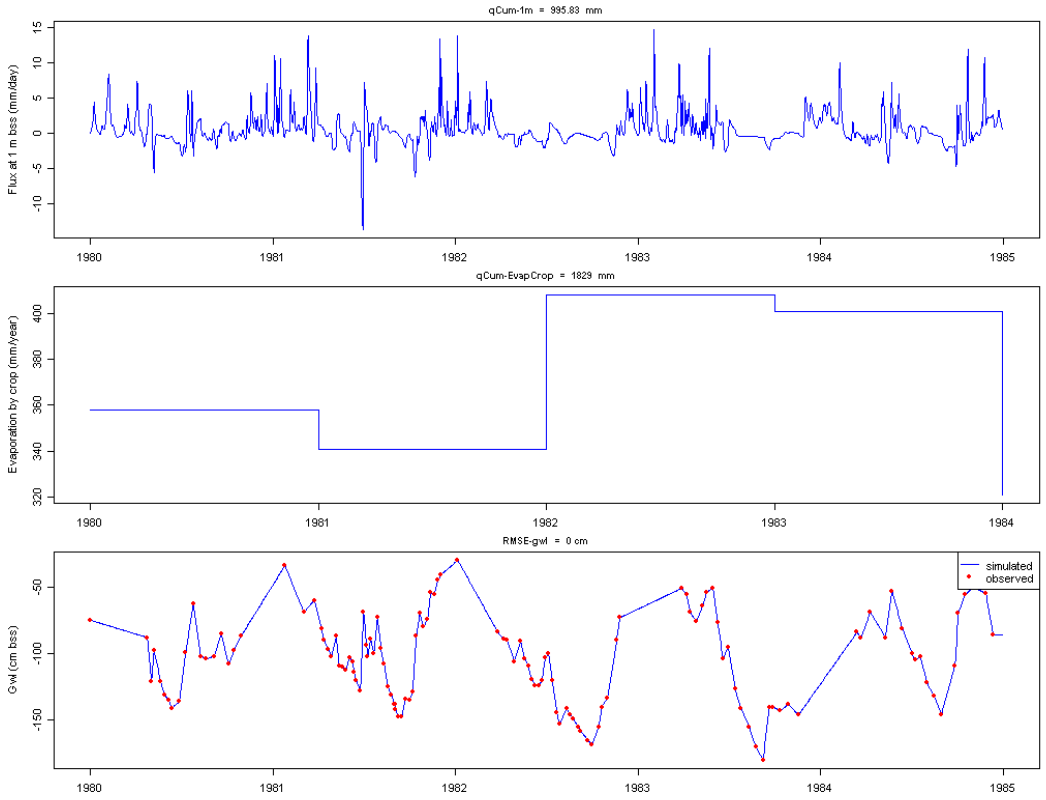
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	995.83			
2	qCum-EvapCrop	mm	1829.00			
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	193	148	188
evicpr	−95	−100	−85	−66	−73
evicir	0	0	0	0	0
evso	−88	−87	−91	−90	−78
evsubl	0	0	0	0	0
evpn	0	0	0	0	0
flev	−358	−341	−408	−401	−321
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	−333	−485	−251	−413	−421
deltast	−29	−15	34	60	−38
deltapn	0	0	0	0	0
deltasnow	0	0	0	0	0
badev	0	0	0	0	0
evsoma	−98	−96	−108	−104	−85
evtrma	−359	−344	−410	−409	−322

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	
drainage	
irrigation	
bottomboundary	
reference	Hendriks et al ()

Project: zeg13
File name: zeg13.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:42:47 2008
Simulation stopped at Wed May 14 13:43:01 2008
Simulation elapsed time 13.36 (sec)

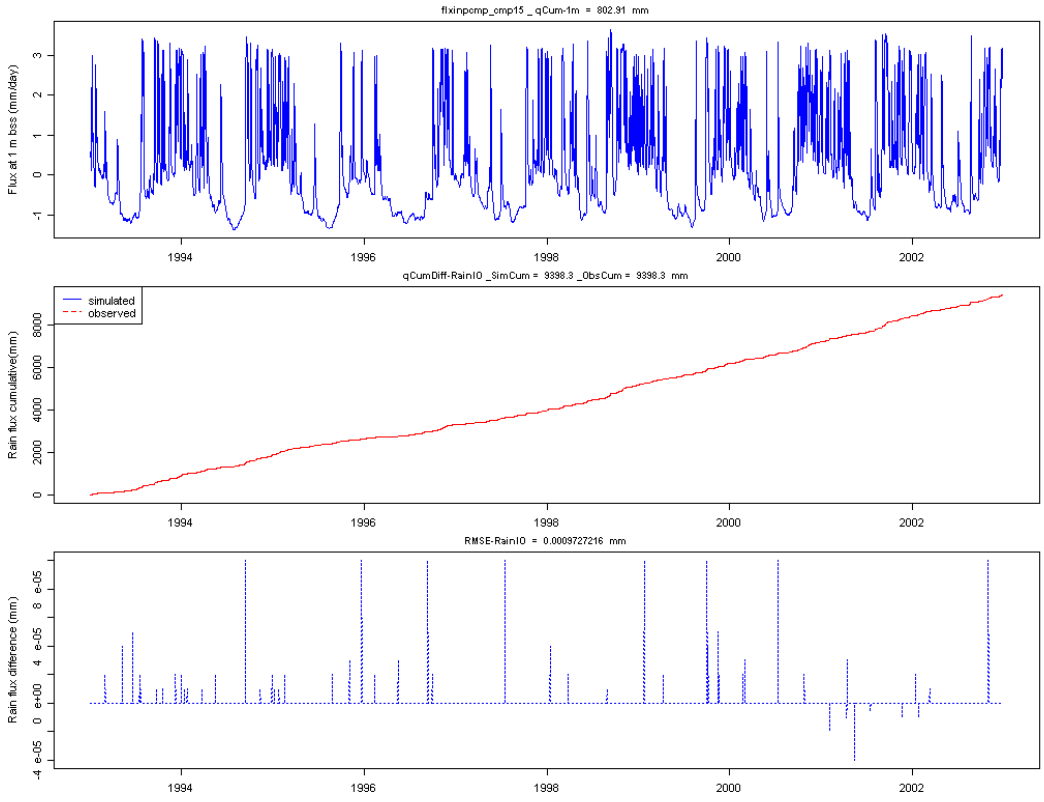
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	802.91			
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	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1993.00	1994.00	1995.00	1996.00	1997.00	1998.00	1999.00	2000.00	2001.
Igrai	922.00	959.00	767.00	646.00	674.00	1193.00	1020.00	1014.00	1215.
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	254.00	255.00	308.00	331.00	300.00	185.00	262.00	231.00	170.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	−91.00	−101.00	−91.00	−74.00	−84.00	−117.00	−111.00	−112.00	−127.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−114.00	−107.00	−108.00	−91.00	−113.00	−116.00	−113.00	−119.00	−120.
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−406.00	−386.00	−439.00	−418.00	−444.00	−337.00	−441.00	−397.00	−337.
runoff	−134.00	−143.00	−57.00	−54.00	−44.00	−192.00	−142.00	−95.00	−179.
fldrou1	−85.00	−105.00	−78.00	−64.00	−46.00	−143.00	−103.00	−117.00	−144.
fldrou2	−207.00	−252.00	−184.00	−153.00	−112.00	−343.00	−243.00	−274.00	−344.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	−129.00	−128.00	−124.00	−123.00	−127.00	−133.00	−127.00	−130.00	−134.
deltast	−2.00	0.00	5.00	0.00	−3.00	3.00	−2.00	−1.00	0.
deltapn	−7.00	6.00	1.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	−133.00	−140.00	−146.00	−129.00	−133.00	−129.00	−142.00	−136.00	−136.
evtrma	−460.00	−479.00	−520.00	−468.00	−484.00	−400.00	−500.00	−455.00	−409.

16 Hysterese(Hupsel)

Tabel 58: Description of case

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

Project: HupselHyst
File name: HupselHyst.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:43:02 2008
Simulation stopped at Wed May 14 13:43:05 2008
Simulation elapsed time 2.83 (sec)

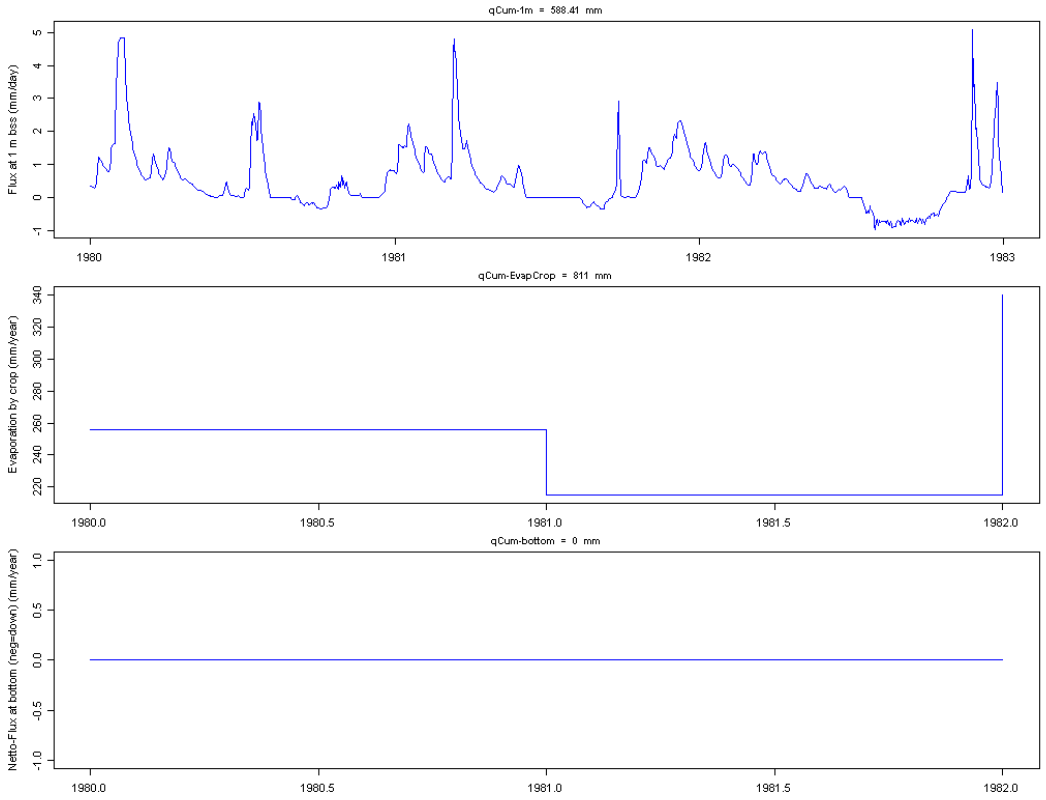
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	588.41			
2	qCum-EvapCrop	mm	811.00			
3	qCum-bottom	cm	0.00			



Figuur 14: Hysterese(Hupsel)

Tabel 61: Waterbalans

	1	2	3
ipl	1.00	1.00	1.00
yr	1980.00	1981.00	1982.00
Igrai	564.00	775.00	566.00
Igsnow	13.00	24.00	1.00
Igirr	1.00	0.00	0.00
RunOn	0.00	0.00	0.00
fldrin1	0.00	0.00	0.00
fldrin2	0.00	0.00	0.00
fldrin3	0.00	0.00	0.00
flindr4	0.00	0.00	0.00
fldrin5	0.00	0.00	0.00
flbtin	0.00	0.00	0.00
evicpr	−45.00	−14.00	−41.00
evicir	0.00	0.00	0.00
evso	−136.00	−173.00	−158.00
evsubl	−6.00	0.00	0.00
evpn	0.00	0.00	0.00
flev	−256.00	−215.00	−340.00
runoff	−69.00	−6.00	0.00
fldrou1	−330.00	−371.00	−157.00
fldrou2	0.00	0.00	0.00
fldrou3	0.00	0.00	0.00
fldrou4	0.00	0.00	0.00
fldrou5	0.00	0.00	0.00
flbtou	0.00	0.00	0.00
deltast	−38.00	−20.00	129.00
deltapn	0.00	0.00	0.00
deltasnow	220.00	0.00	0.00
badev	−83.00	0.00	0.00
evsoma	−340.00	−317.00	−342.00
evtrma	−296.00	−215.00	−353.00

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:43:06 2008
Simulation stopped at Wed May 14 13:43:07 2008
Simulation elapsed time 0.37 (sec)

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

Tabel 63: Iteration parameters

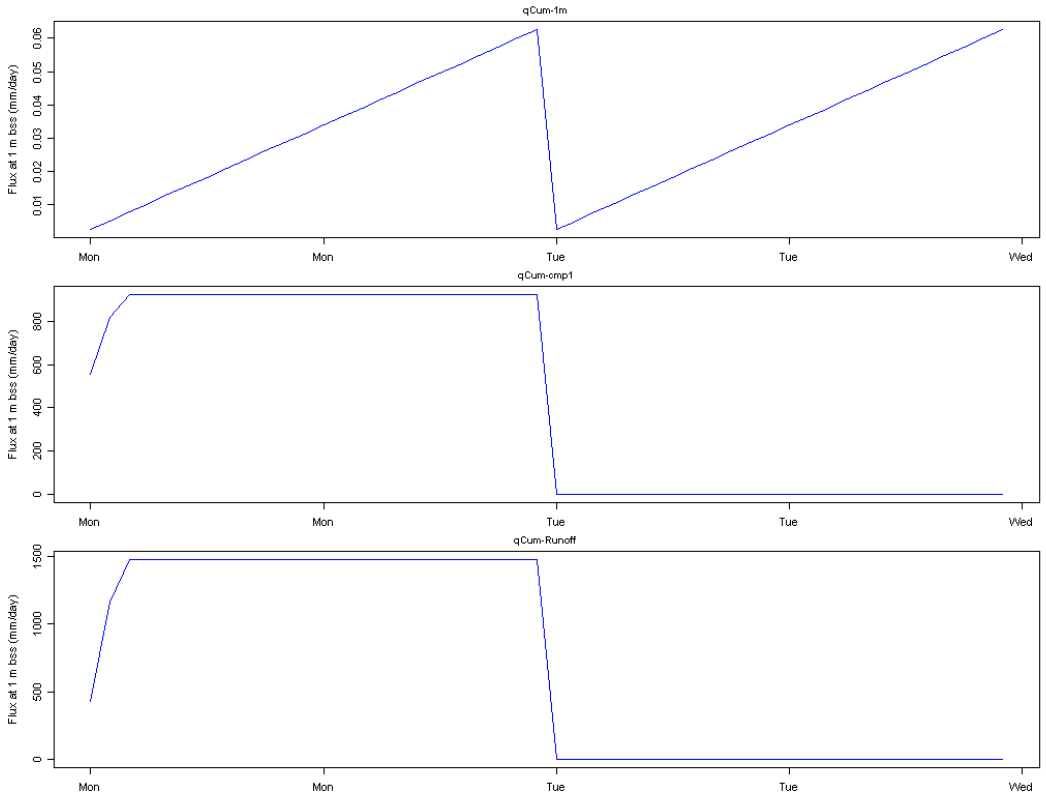
	variables	values	units
1	DTMIN	1e-06	(d)
2	DTMAX	0.2	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	30	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 64: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	1.56			
2	qCum-cmp1	mm	21704.75			
3	qCum-Runoff	mm	34060.43			

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	
drainage	
irrigation	
bottomboundary	
reference	Titkak et al ()

Project: speuld
File name: speuld.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:43:07 2008
Simulation stopped at Wed May 14 13:43:10 2008
Simulation elapsed time 2.95 (sec)

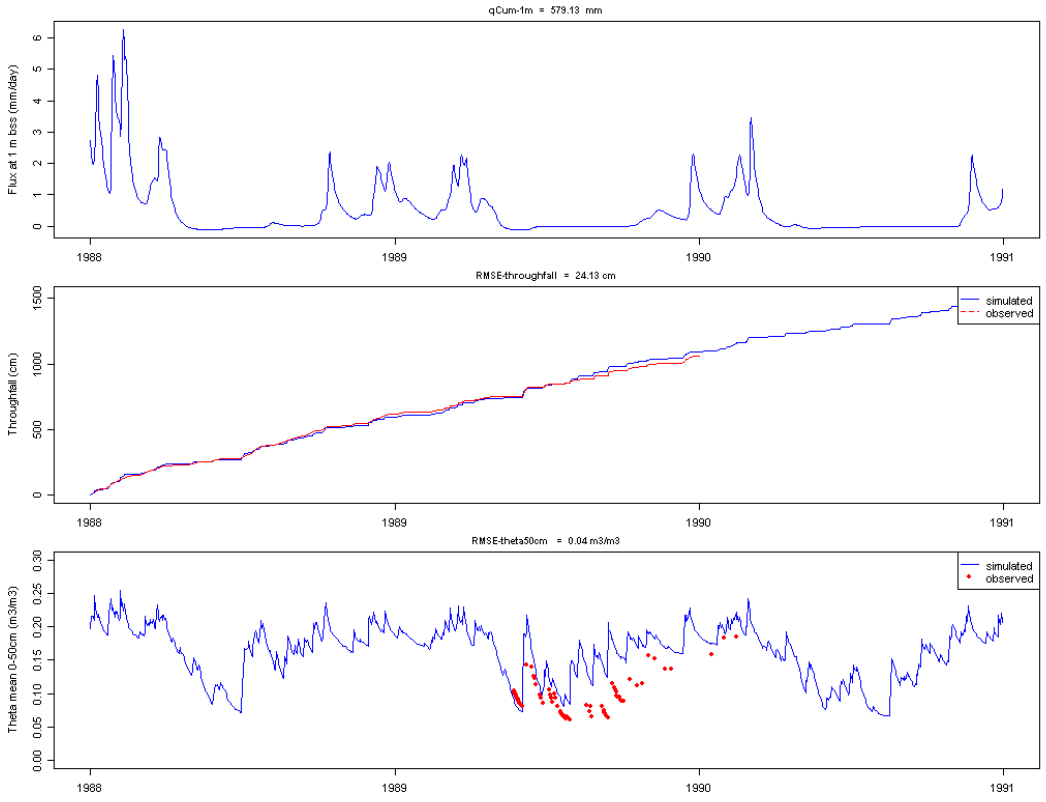
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	579.13			
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	1.00	1.00	1.00
yr	1988.00	1989.00	1990.00
Igrai	933.00	806.00	715.00
Igsnow	0.00	0.00	0.00
Igirr	0.00	0.00	0.00
RunOn	0.00	0.00	0.00
fldrin1	0.00	0.00	0.00
fldrin2	0.00	0.00	0.00
fldrin3	0.00	0.00	0.00
flindr4	0.00	0.00	0.00
fldrin5	0.00	0.00	0.00
flbtin	0.00	0.00	0.00
evicpr	−336.00	−307.00	−283.00
evicir	0.00	0.00	0.00
evso	−35.00	−43.00	−43.00
evsubl	0.00	0.00	0.00
evpn	0.00	0.00	0.00
flev	−322.00	−389.00	−309.00
runoff	0.00	0.00	0.00
fldrou1	0.00	0.00	0.00
fldrou2	0.00	0.00	0.00
fldrou3	0.00	0.00	0.00
fldrou4	0.00	0.00	0.00
fldrou5	0.00	0.00	0.00
flbtou	−429.00	−116.00	−72.00
deltast	189.00	49.00	−8.00
deltapn	0.00	0.00	0.00
deltasnow	0.00	0.00	0.00
badev	0.00	0.00	0.00
evsoma	−36.00	−47.00	−46.00
evtrma	−359.00	−461.00	−451.00

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	
drainage	
irrigation	
bottomboundary	
reference	Hendriks et al ()

Project: Vlietp
File name: Vlietp.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:43:12 2008
Simulation stopped at Wed May 14 13:43:15 2008
Simulation elapsed time 3.38 (sec)

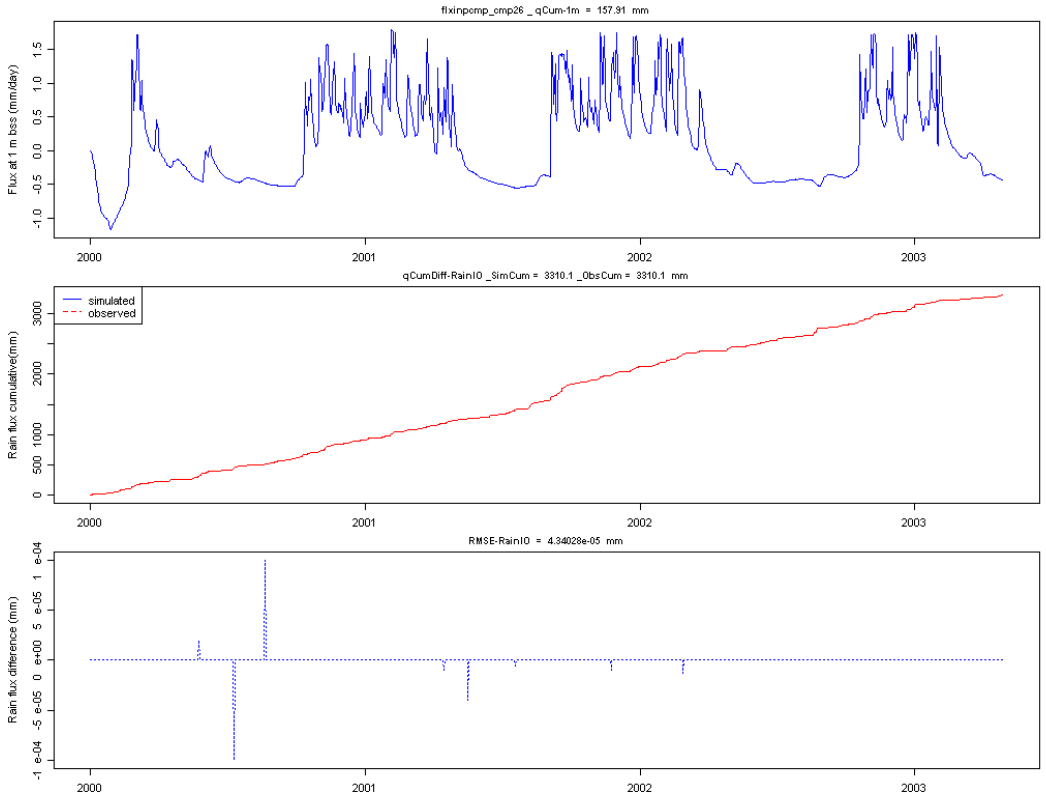
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	157.91			
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	1.00	1.00	1.00
yr	2000.00	2001.00	2002.00
Igrai	908.00	1215.00	989.00
Igsnow	0.00	0.00	0.00
Igirr	0.00	0.00	0.00
RunOn	0.00	0.00	0.00
fldrin1	159.00	68.00	102.00
fldrin2	0.00	0.00	0.00
fldrin3	0.00	0.00	0.00
flindr4	0.00	0.00	0.00
fldrin5	0.00	0.00	0.00
flbtin	0.00	0.00	0.00
evicpr	−111.00	−127.00	−103.00
evicir	0.00	0.00	0.00
evso	−112.00	−118.00	−117.00
evsubl	0.00	0.00	0.00
evpn	0.00	0.00	0.00
flev	−413.00	−367.00	−412.00
runoff	−109.00	−221.00	−149.00
fldrou1	−108.00	−261.00	−177.00
fldrou2	−61.00	−166.00	−110.00
fldrou3	0.00	0.00	0.00
fldrou4	0.00	0.00	0.00
fldrou5	0.00	0.00	0.00
flbtou	−20.00	−23.00	−22.00
deltast	−132.00	−1.00	−1.00
deltapn	0.00	0.00	0.00
deltasnow	0.00	0.00	0.00
badev	0.00	0.00	0.00
evsoma	−130.00	−135.00	−133.00
evtrma	−433.00	−410.00	−437.00

20 IrrigationScheduledFixedTiming(Sevilla)

Tabel 74: Description of case

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

Project: sevi
File name: sevi.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:43:17 2008
Simulation stopped at Wed May 14 13:43:51 2008
Simulation elapsed time 34.17 (sec)

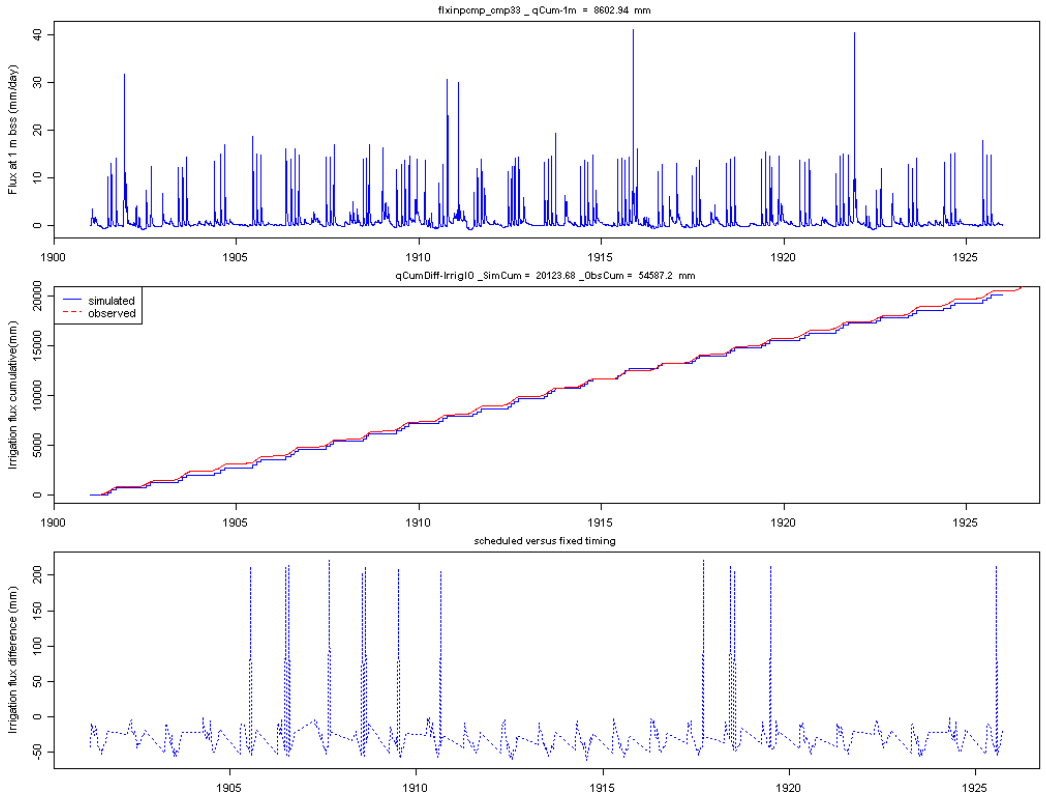
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	8602.94			
2	qCumDiff-IrrigIO	mm	20123.68	54587.20	−34463.52	
3	RMSE-IrrigIO	mm	9968.25	10233.89	0.00	0.00



Figuur 18: IrrigationScheduledFixedTiming(Sevilla)

Tabel 77: Waterbalans

	1	2	3	4	5	6	7	8
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
yr	1901.00	1902.00	1903.00	1904.00	1905.00	1906.00	1907.00	1908.00
Igrai	808.00	434.00	370.00	378.00	316.00	277.00	472.00	849.00
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Igirr	750.00	473.00	758.00	782.00	792.00	1055.00	781.00	784.00
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
evicpr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
evso	−312.00	−244.00	−256.00	−212.00	−220.00	−214.00	−272.00	−291.00
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
flev	−1046.00	−880.00	−1000.00	−970.00	−965.00	−1075.00	−983.00	−1122.00
runoff	−7.00	−3.00	−14.00	−7.00	−19.00	−24.00	−7.00	−12.00
fldrou1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
flbtou	−10.00	−50.00	−1.00	0.00	0.00	0.00	0.00	0.00
deltast	−183.00	269.00	143.00	29.00	97.00	−20.00	7.00	−209.00
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
evsoma	−580.00	−486.00	−543.00	−531.00	−534.00	−523.00	−503.00	−508.00
evtrma	−1058.00	−901.00	−1012.00	−982.00	−979.00	−1090.00	−995.00	−1137.00

21 MacroPores1

Tabel 78: Description of case

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

Project: Andelst
File name: Andelst.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:43:53 2008
Simulation stopped at Wed May 14 13:45:12 2008
Simulation elapsed time 78.92 (sec)

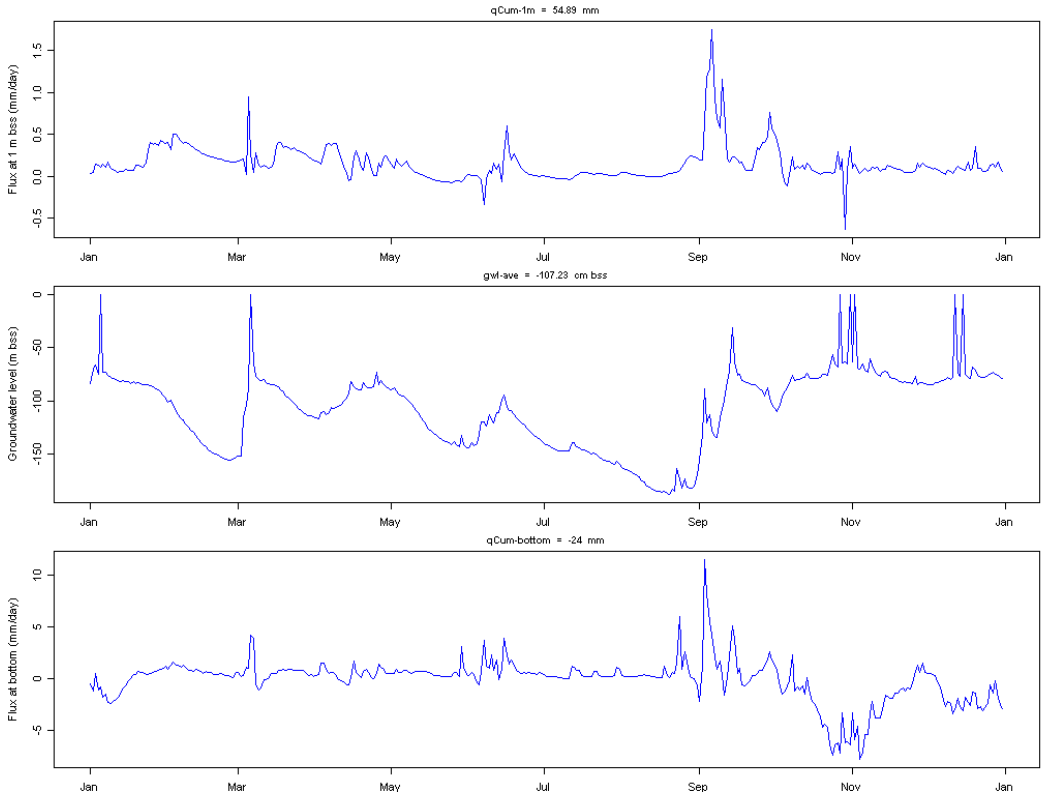
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	54.89			
2	gwl-ave	cm bss	−107.23			
3	qCum-bottom	mm	−24.00			



Figuur 19: MacroPores1

Tabel 81: Waterbalans

	1
ipl	1.00
yr	1998.00
Igrai	1111.00
Igsnow	0.00
Igirr	0.00
RunOn	0.00
fldrin1	0.00
fldrin2	0.00
fldrin3	0.00
flindr4	0.00
fldrin5	0.00
flbtin	253.00
evicpr	−32.00
evicir	0.00
evso	−264.00
evsubl	0.00
evpn	0.00
flev	−120.00
runoff	0.00
fldrou1	−29.00
fldrou2	0.00
fldrou3	0.00
fldrou4	0.00
fldrou5	0.00
flbtou	−229.00
deltast	−8.00
deltapn	0.00
deltasnow	0.00
badev	681.00
evsoma	−356.00
evtrma	−160.00

22 MacroPores2

Tabel 82: Description of case

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

Project: Vlierd
File name: Vlierd.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:45:13 2008
Simulation stopped at Wed May 14 13:45:18 2008
Simulation elapsed time 4.44 (sec)

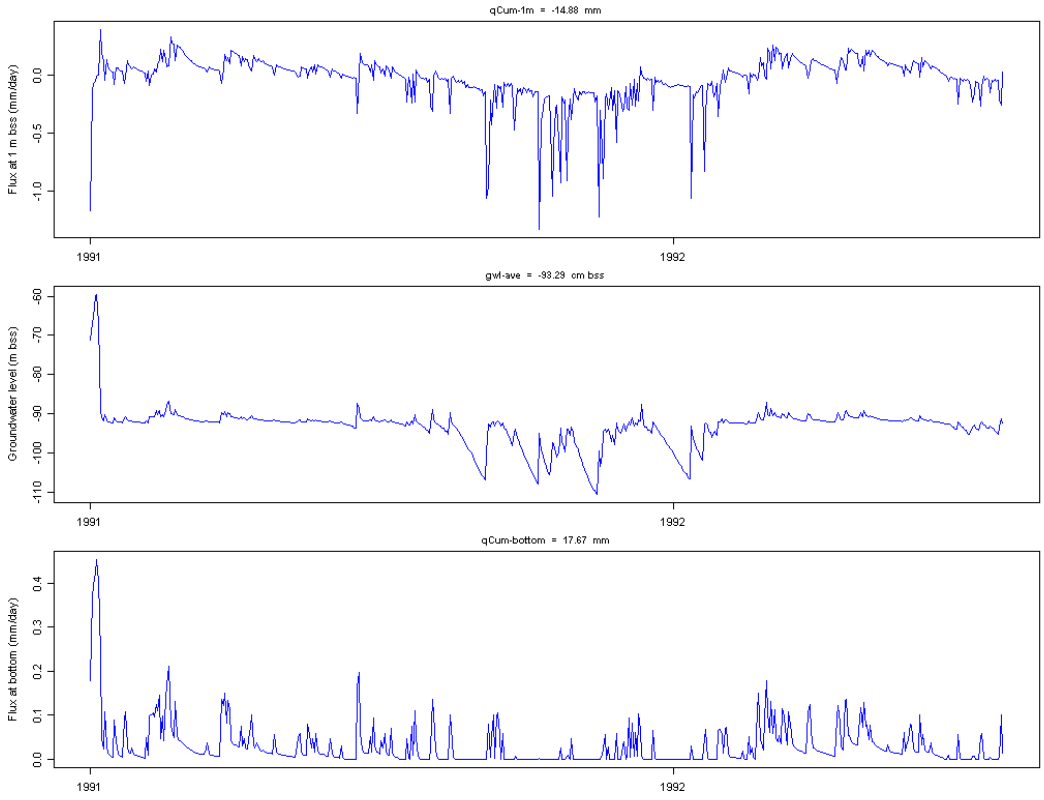
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	−14.88			
2	gwl-ave	cm bss	−93.29			
3	qCum-bottom	mm	17.67			



Figuur 20: MacroPores2

Tabel 85: Waterbalans

	1
ipl	1.00
yr	1991.00
Igrai	671.00
Igsnow	0.00
Igirr	0.00
RunOn	0.00
fldrin1	0.00
fldrin2	0.00
fldrin3	0.00
flindr4	0.00
fldrin5	0.00
flbtin	0.00
evicpr	−81.00
evicir	0.00
evso	0.00
evsubl	0.00
evpn	0.00
flev	−343.00
runoff	0.00
fldrou1	−156.00
fldrou2	0.00
fldrou3	0.00
fldrou4	0.00
fldrou5	0.00
flbtou	0.00
deltast	−66.00
deltapn	0.00
deltasnow	220.00
badev	246.00
evsoma	0.00
evtrma	−482.00

23 MeteoDetailedInOut(Hupsel)

Tabel 86: Description of case

	21
CaseNr	21
dirnam	MeteoDetailedInOut(Hupsel)
Purpose	daily fluctuation of ET
Location	Hupsel-NL
SimulationPeriod	May-80
SoilType	loamy sand
CropType	grass
drainage	tile drains
irrigation	no
bottomboundary	zero flux
reference	Allen et al, 1998, FAO56

Project: MeteoDetail
File name: MeteoDetail.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:45:19 2008
Simulation stopped at Wed May 14 13:45:20 2008
Simulation elapsed time 0.5 (sec)

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

Tabel 87: Iteration parameters

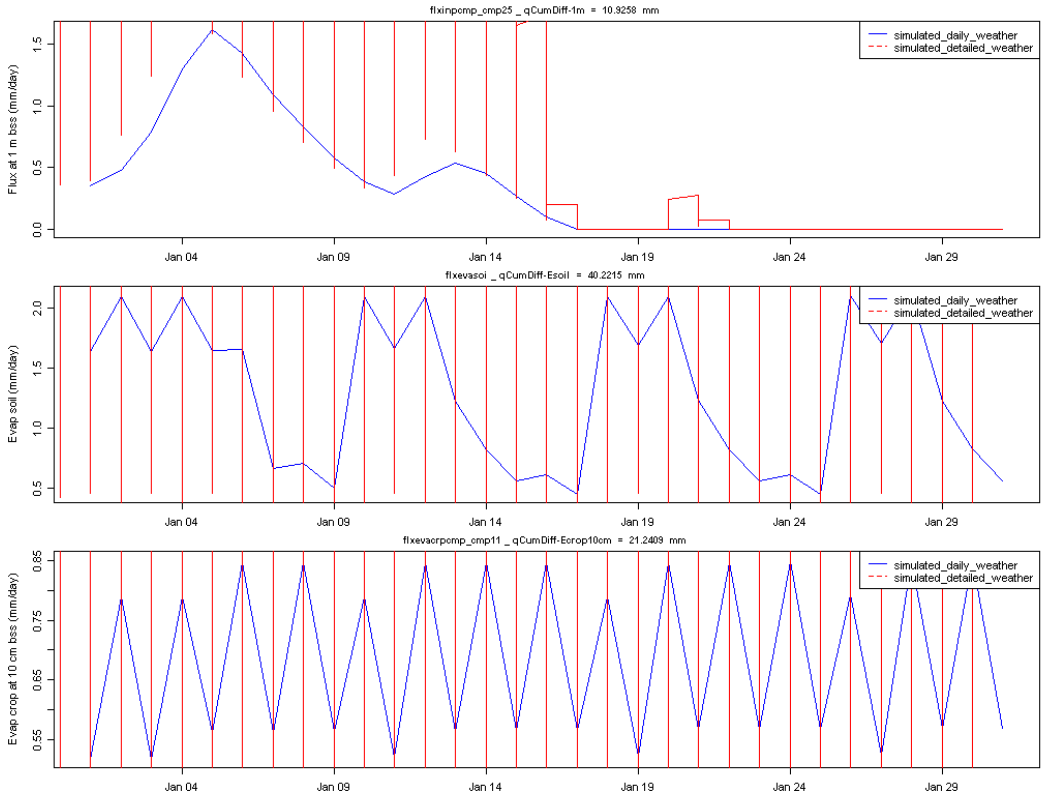
	variables	values	units
1	DTMIN	1e-04	(d)
2	DTMAX	0.5	(d)
3	GWLCONV	100	(cm)
4	CRITDEVMASBALABS	0.099	(d)
5	CRITDEVMASBALDT	NA	(d)
6	CRITDEVPONDDT	1e-04	(cm)
7	MAXIT	50	(-)
8	MAXBACKTR	3	(-)
9	SWkmean	1	(-)
10	SWkImpl	0	(-)

Tabel 88: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCumDiff-1m	mm	10.93	677.60	−1.84	3.50
2	qCumDiff-Esoil	mm	40.22	2159.46	−5.64	8.44
3	qCumDiff-Ecrop10cm	mm	21.24	1108.00	−2.92	3.76

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	
drainage	
irrigation	
bottomboundary	
reference	Hendriks et al ()

Project: Andelst
File name: Andelst.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:45:21 2008
Simulation stopped at Wed May 14 13:45:25 2008
Simulation elapsed time 4.53 (sec)

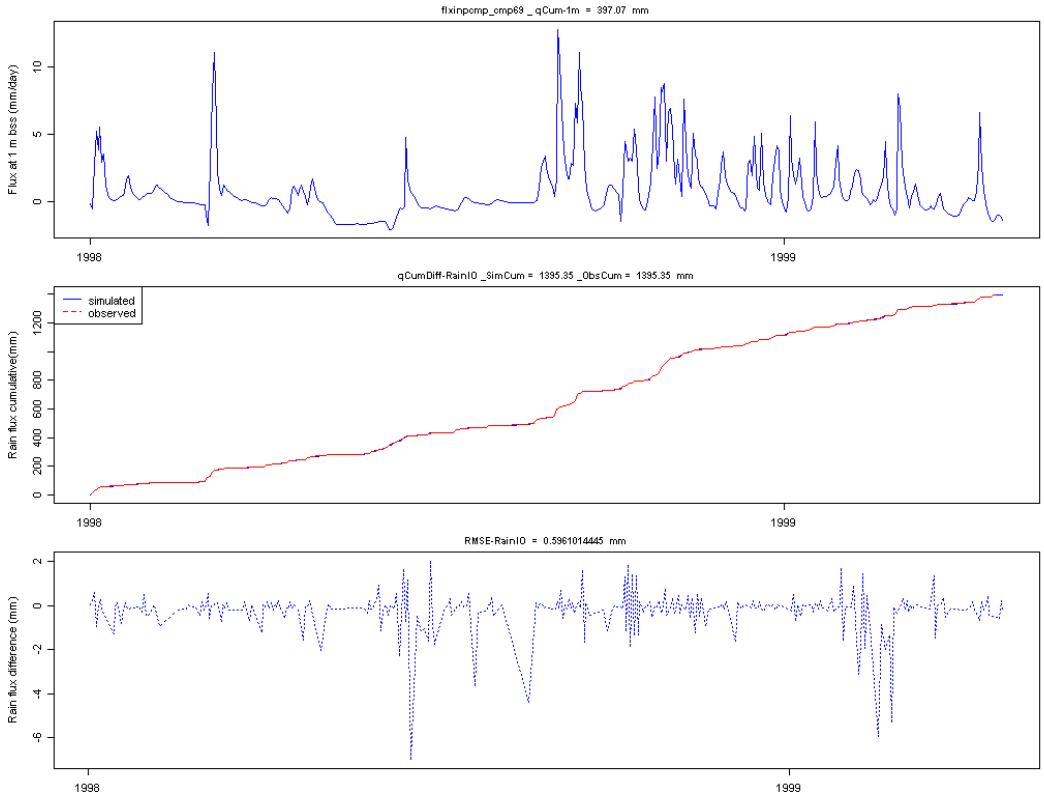
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	397.07			
2	qCumDiff-RainIO	mm	1395.35	1395.35	0.00	
3	RMSE-RainIO	mm	701.48	701.21	0.27	0.60



Figuur 22: MeteoPrecipitationDetail(Andelst)

Tabel 93: Waterbalans

	1
ipl	1.00
yr	1998.00
Igrai	1111.00
Igsnow	0.00
Igirr	0.00
RunOn	0.00
fldrin1	0.00
fldrin2	0.00
fldrin3	0.00
flindr4	0.00
fldrin5	0.00
flbtin	561.00
evicpr	−40.00
evicir	0.00
evso	−349.00
evsubl	0.00
evpn	0.00
flev	−194.00
runoff	−21.00
fldrou1	−983.00
fldrou2	0.00
fldrou3	0.00
fldrou4	0.00
fldrou5	0.00
flbtou	−86.00
deltast	2.00
deltapn	0.00
deltasnow	0.00
badev	0.00
evsoma	−448.00
evtrma	−201.00

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:45:26 2008
Simulation stopped at Wed May 14 13:45:27 2008
Simulation elapsed time 1.08 (sec)

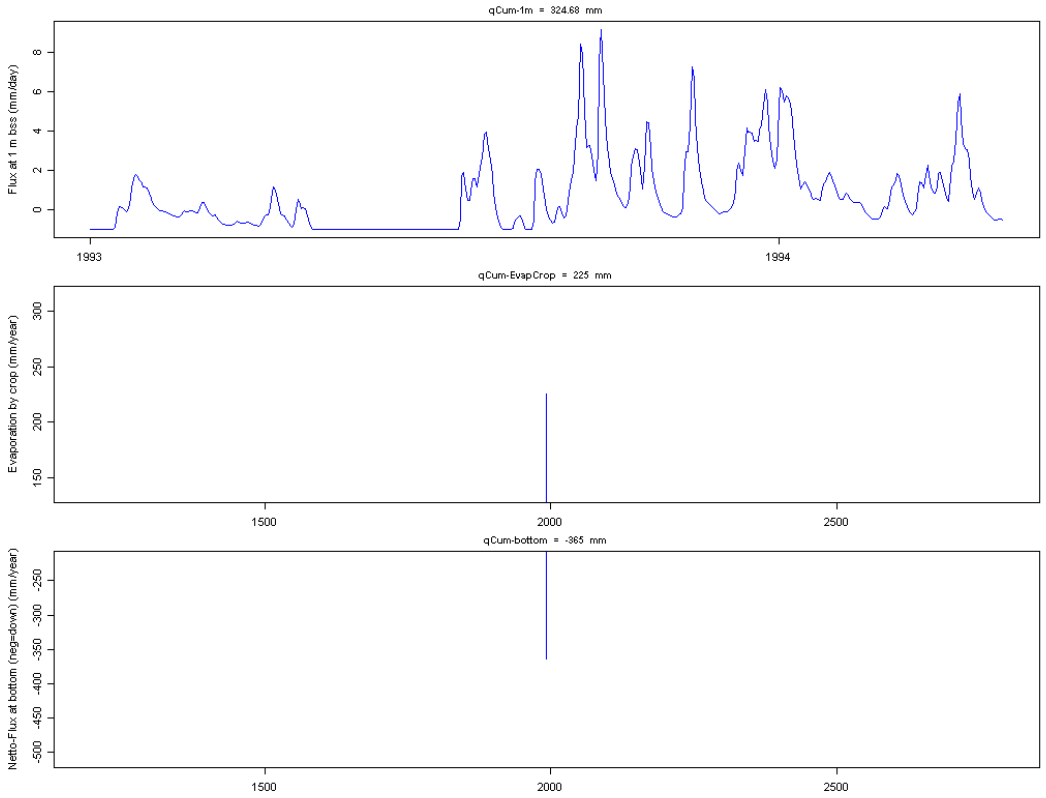
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	324.68			
2	qCum-EvapCrop	mm	225.00			
3	qCum-bottom	cm	−365.00			



Figuur 23: PearlDrainageBasic

Tabel 97: Waterbalans

	1
ipl	1.00
yr	1993.00
Igrai	898.00
Igsnow	0.00
Igirr	0.00
RunOn	0.00
fldrin1	0.00
fldrin2	0.00
fldrin3	0.00
flindr4	0.00
fldrin5	0.00
flbtin	365.00
evicpr	−12.00
evicir	0.00
evso	−297.00
evsubl	0.00
evpn	0.00
flev	−225.00
runoff	0.00
fldrou1	−9.00
fldrou2	−638.00
fldrou3	0.00
fldrou4	0.00
fldrou5	0.00
flbtou	0.00
deltast	−82.00
deltapn	0.00
deltasnow	0.00
badev	0.00
evsoma	−440.00
evtrma	−225.00

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:45:28 2008
Simulation stopped at Wed May 14 13:46:07 2008
Simulation elapsed time 38.29 (sec)

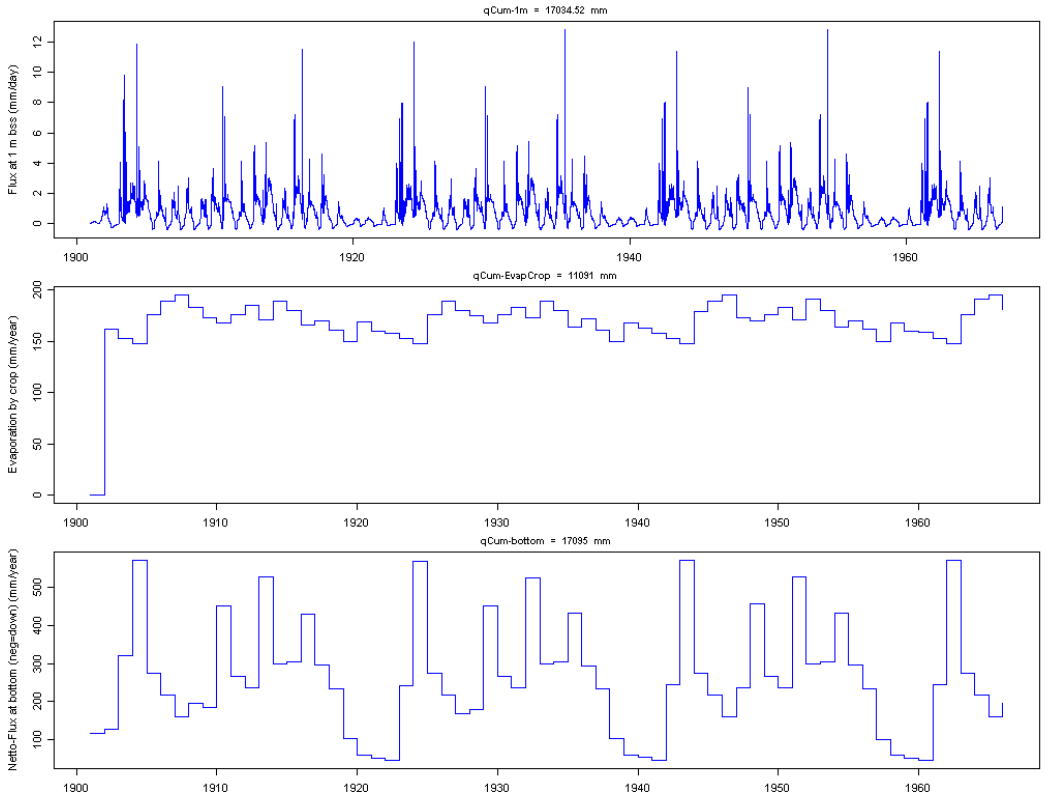
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 99: 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 100: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	17034.52			
2	qCum-EvapCrop	mm	11091.00			
3	qCum-bottom	cm	17095.00			



Figuur 24: PearlFocus1(Joki-m)

Tabel 101: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1901.00	1902.00	1903.00	1904.00	1905.00	1906.00	1907.00	1908.00	1909.
Igrai	375.00	393.00	964.00	964.00	630.00	558.00	659.00	512.00	730.
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−255.00	−209.00	−243.00	−242.00	−236.00	−219.00	−271.00	−191.00	−243.
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	0.00	−162.00	−153.00	−148.00	−176.00	−189.00	−195.00	−183.00	−173.
runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	−115.00	−127.00	−320.00	−572.00	−275.00	−218.00	−161.00	−195.00	−184.
deltast	−5.00	105.00	−248.00	−1.00	57.00	69.00	−33.00	57.00	−129.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	−604.00	−360.00	−314.00	−313.00	−328.00	−333.00	−366.00	−329.00	−305.
evtrma	0.00	−179.00	−153.00	−155.00	−176.00	−189.00	−195.00	−185.00	−173.

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:46:11 2008
Simulation stopped at Wed May 14 13:47:10 2008
Simulation elapsed time 59.17 (sec)

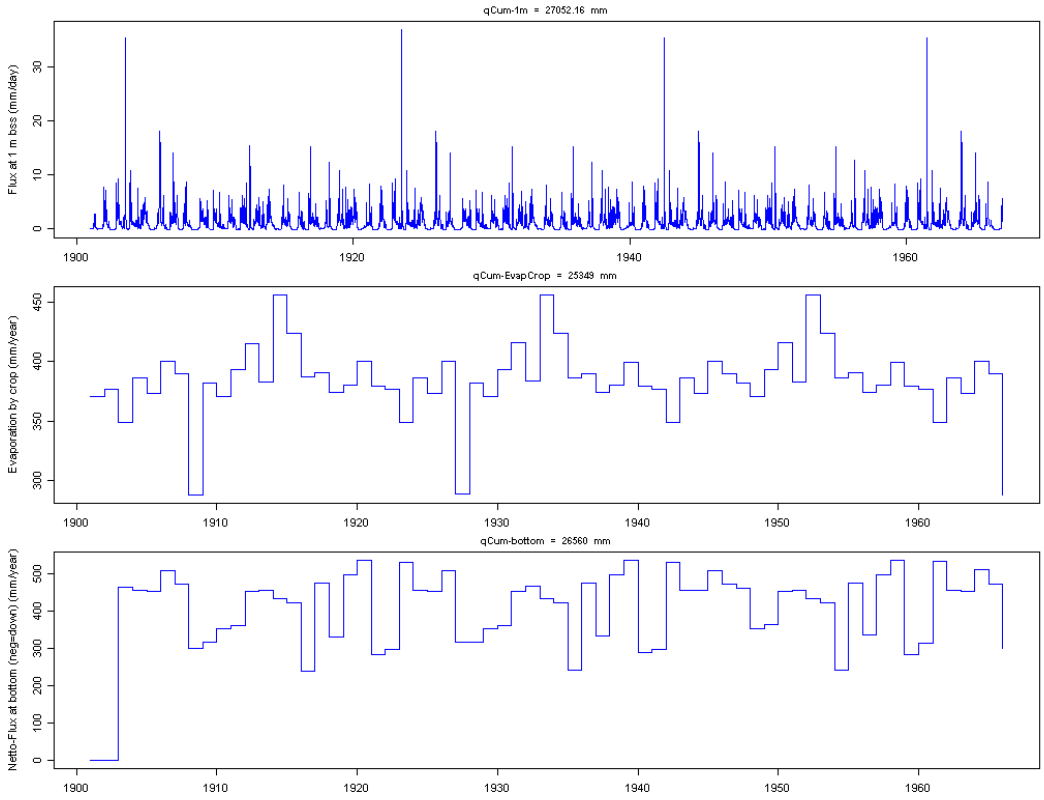
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 103: 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 104: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	27052.16			
2	qCum-EvapCrop	mm	25349.00			
3	qCum-bottom	cm	26560.00			



Figuur 25: PearlFocus2(Okeh-m)

Tabel 105: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1901.00	1902.00	1903.00	1904.00	1905.00	1906.00	1907.00	1908.00	1909.
Igrai	938.00	1016.00	1113.00	1132.00	972.00	1158.00	1083.00	673.00	1056.
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−225.00	−221.00	−201.00	−231.00	−231.00	−252.00	−242.00	−231.00	−254.
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−371.00	−377.00	−349.00	−386.00	−373.00	−400.00	−390.00	−288.00	−382.
runoff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	−3.
fldrou1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	0.00	0.00	−462.00	−454.00	−453.00	−507.00	−471.00	−300.00	−315.
deltast	−341.00	−418.00	−101.00	−61.00	85.00	1.00	20.00	145.00	−102.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	−298.00	−299.00	−243.00	−276.00	−285.00	−301.00	−298.00	−335.00	−287.
evtrma	−421.00	−422.00	−366.00	−394.00	−419.00	−444.00	−428.00	−511.00	−394.

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:47:14 2008
Simulation stopped at Wed May 14 13:48:05 2008
Simulation elapsed time 50.92 (sec)

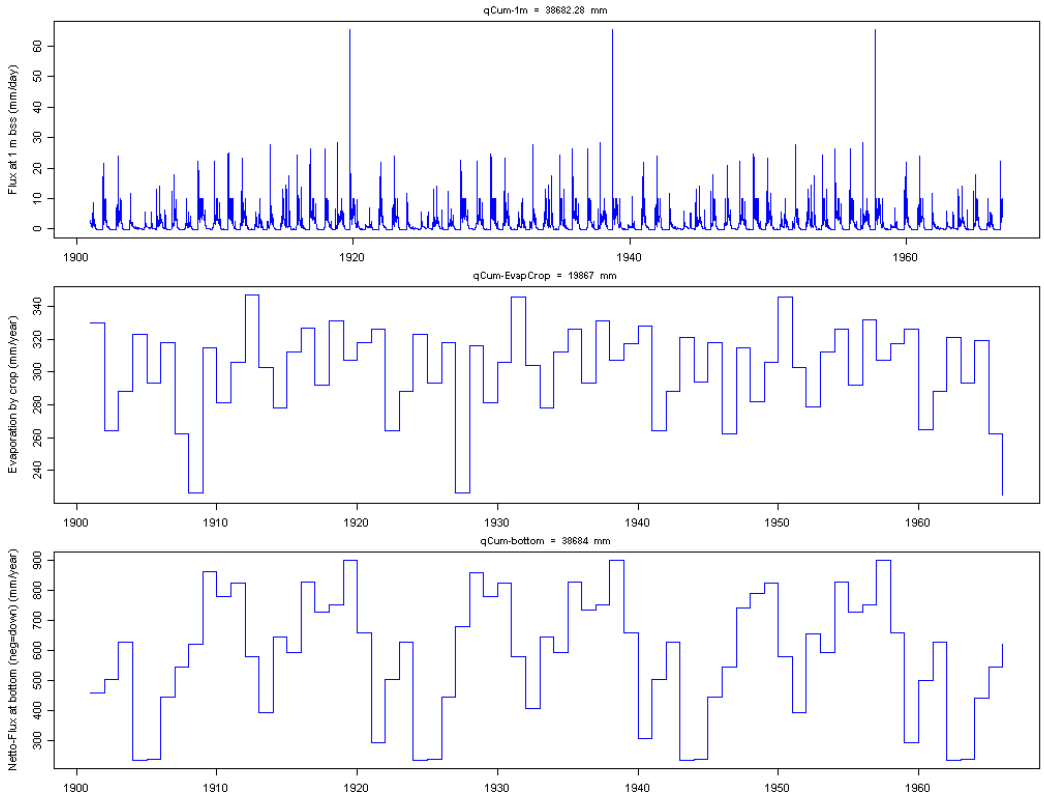
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 107: 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 108: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	38682.28			
2	qCum-EvapCrop	mm	19867.00			
3	qCum-bottom	cm	38684.00			



Figuur 26: PearlFocus3(Port-m)

Tabel 109: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1901.00	1902.00	1903.00	1904.00	1905.00	1906.00	1907.00	1908.00	1909.
Igrai	1123.00	952.00	1073.00	661.00	864.00	923.00	924.00	1176.00	1563.
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−269.00	−180.00	−232.00	−187.00	−193.00	−193.00	−175.00	−146.00	−225.
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−330.00	−264.00	−288.00	−323.00	−293.00	−318.00	−262.00	−226.00	−315.
runoff	−19.00	−16.00	−24.00	−1.00	0.00	0.00	−3.00	−27.00	−183.
fldrou1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	−460.00	−503.00	−630.00	−235.00	−239.00	−444.00	−545.00	−621.00	−862.
deltast	−45.00	12.00	100.00	85.00	−139.00	32.00	62.00	−157.00	23.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	−591.00	−484.00	−464.00	−437.00	−460.00	−397.00	−385.00	−395.00	−385.
evtrma	−470.00	−404.00	−423.00	−355.00	−344.00	−348.00	−353.00	−345.00	−337.

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:48:10 2008
Simulation stopped at Wed May 14 13:49:16 2008
Simulation elapsed time 65.84 (sec)

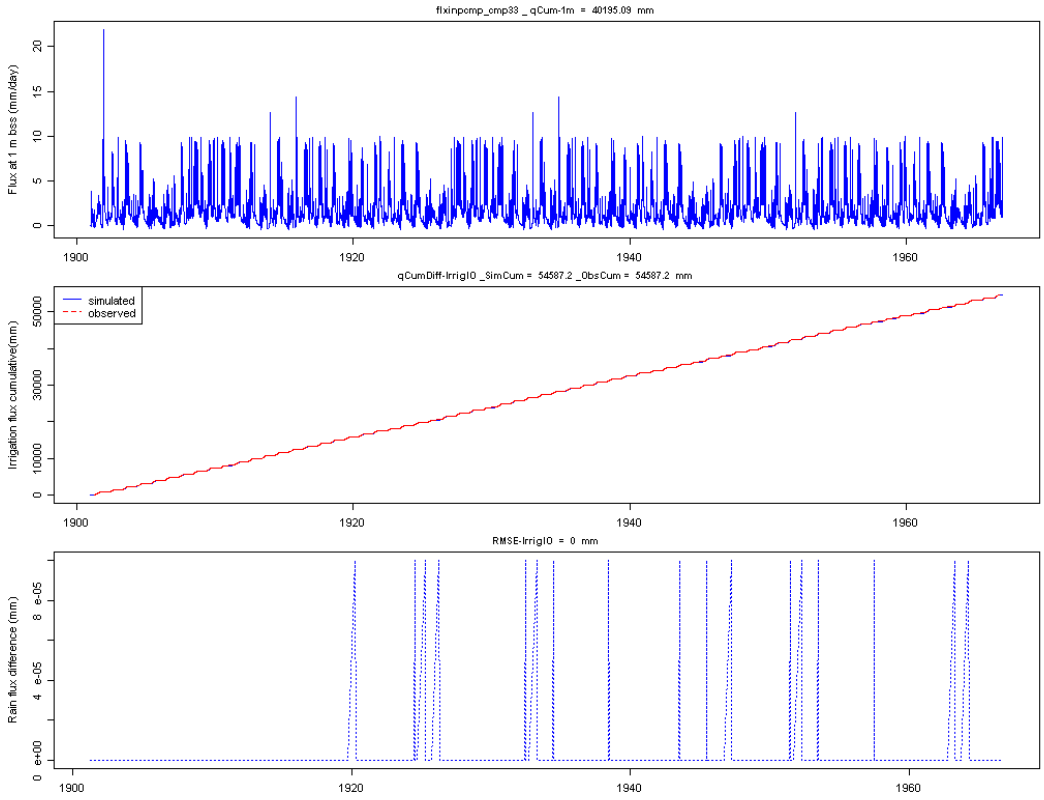
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 111: 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 112: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	40195.09			
2	qCumDiff-IrrigIO	mm	54587.20	54587.20	0.00	
3	RMSE-IrrigIO	mm	27307.13	27307.13	0.00	0.00



Figuur 27: PearlFocus4(Sevi-m)

Tabel 113: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1901.00	1902.00	1903.00	1904.00	1905.00	1906.00	1907.00	1908.00	1909.
Igrai	808.00	434.00	370.00	378.00	316.00	277.00	472.00	849.00	594.
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igirr	817.00	611.00	929.00	759.00	791.00	930.00	735.00	816.00	939.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−322.00	−237.00	−295.00	−240.00	−241.00	−262.00	−270.00	−276.00	−298.
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−862.00	−243.00	−318.00	−337.00	−648.00	−926.00	−300.00	−205.00	−363.
runoff	−16.00	−26.00	−43.00	−28.00	0.00	0.00	−27.00	−150.00	−89.
fldrou1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	−154.00	−574.00	−660.00	−569.00	−221.00	−76.00	−509.00	−970.00	−832.
deltast	−272.00	34.00	18.00	37.00	3.00	57.00	−101.00	−51.00	35.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	−14.00	14.
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	−448.00	−353.00	−410.00	−405.00	−402.00	−406.00	−355.00	−365.00	−384.
evtrma	−867.00	−680.00	−918.00	−855.00	−866.00	−957.00	−800.00	−909.00	−945.

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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:49:21 2008
Simulation stopped at Wed May 14 13:49:22 2008
Simulation elapsed time 1.89 (sec)

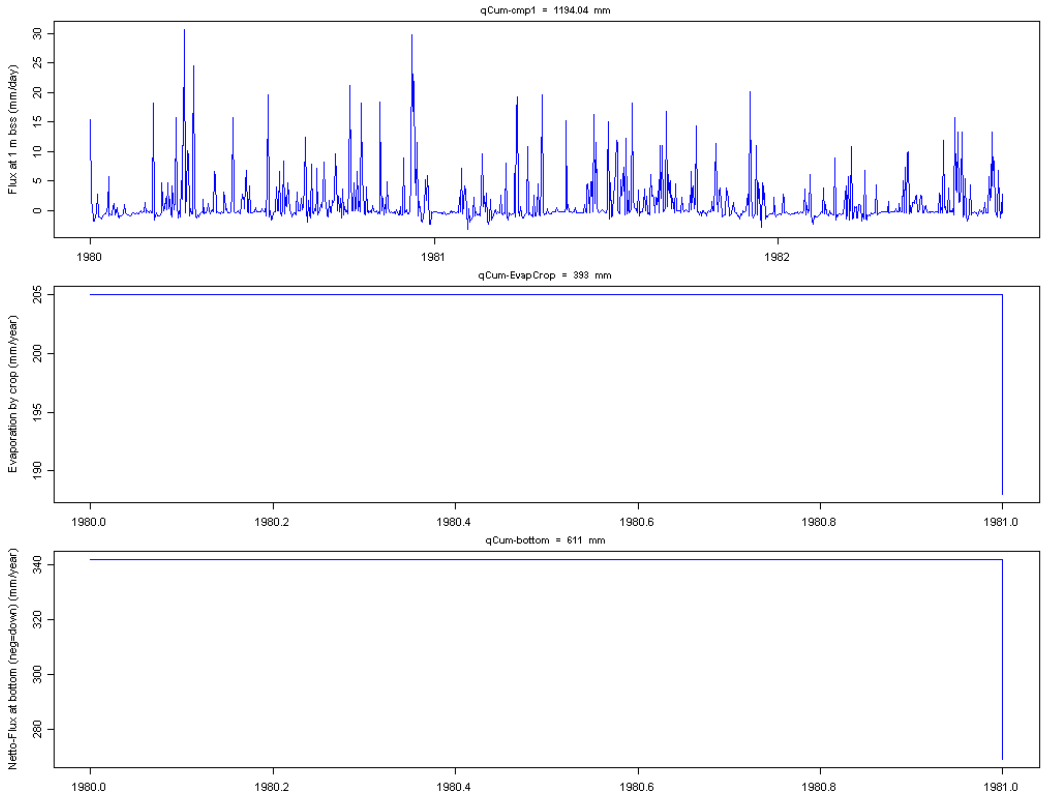
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	1194.04			
2	qCum-EvapCrop	mm	393.00			
3	qCum-bottom	cm	611.00			



Figuur 28: PearlLysimeter

Tabel 117: Waterbalans

	1	2
ipl	1.00	1.00
yr	1980.00	1981.00
Igrai	774.00	682.00
Igsnow	0.00	0.00
Igirr	0.00	0.00
RunOn	0.00	0.00
fldrin1	0.00	0.00
fldrin2	0.00	0.00
fldrin3	0.00	0.00
flindr4	0.00	0.00
fldrin5	0.00	0.00
flbtin	0.00	0.00
evicpr	0.00	0.00
evicir	0.00	0.00
evso	−226.00	−227.00
evsubl	0.00	0.00
evpn	0.00	0.00
flev	−205.00	−188.00
runoff	0.00	0.00
fldrou1	0.00	0.00
fldrou2	0.00	0.00
fldrou3	0.00	0.00
fldrou4	0.00	0.00
fldrou5	0.00	0.00
flbtou	−342.00	−269.00
deltast	0.00	2.00
deltapn	0.00	0.00
deltasnow	0.00	0.00
badev	0.00	0.00
evsoma	−377.00	−343.00
evtrma	−205.00	−188.00

31 ShallowSoil(EuroHarpITE)

Tabel 118: Description of case

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

Project: run.5212.2.swap
File name: run.5212.2.swap.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:49:24 2008
Simulation stopped at Wed May 14 13:49:30 2008
Simulation elapsed time 6.72 (sec)

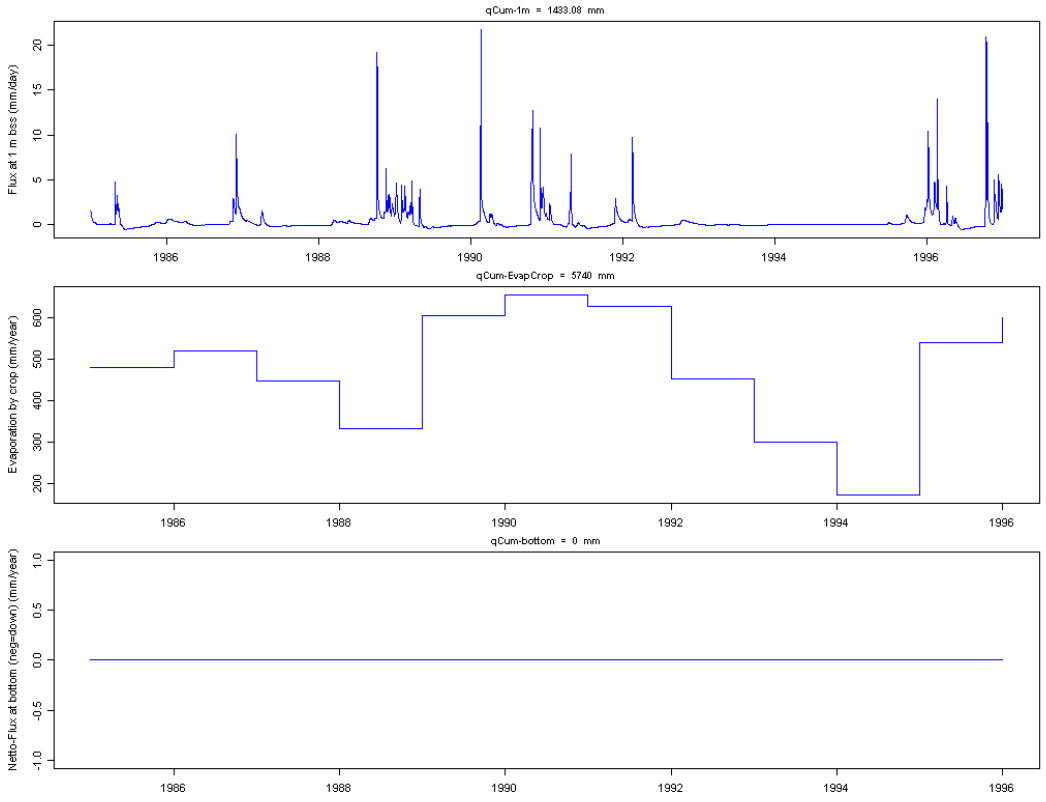
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	1433.08			
2	qCum-EvapCrop	mm	5740.00			
3	qCum-bottom	cm	0.00			



Figuur 29: ShallowSoil(EuroHarpITE)

Tabel 121: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1985.00	1986.00	1987.00	1988.00	1989.00	1990.00	1991.00	1992.00	1993.
Igrai	625.00	754.00	432.00	951.00	747.00	1242.00	753.00	624.00	302.
Igsnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	−26.00	−66.00	−32.00	−40.00	−43.00	−105.00	−70.00	−41.00	−15.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−198.00	−110.00	−144.00	−203.00	−166.00	−104.00	−106.00	−181.00	−130.
evsubl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−480.00	−521.00	−449.00	−333.00	−606.00	−656.00	−628.00	−452.00	−300.
runoff	−2.00	0.00	0.00	−2.00	0.00	−11.00	−8.00	−10.00	0.
fldrou1	−72.00	0.00	0.00	−83.00	−213.00	−90.00	−68.00	0.00	0.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltast	153.00	−57.00	193.00	−290.00	281.00	−276.00	128.00	59.00	143.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
badev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evsoma	−494.00	−223.00	−478.00	−618.00	−309.00	−225.00	−208.00	−466.00	−614.
evtrma	−495.00	−692.00	−481.00	−339.00	−665.00	−700.00	−686.00	−453.00	−354.

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	
drainage	
irrigation	
bottomboundary	
reference	-

Project: Boreas
File name: Boreas.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:49:32 2008
Simulation stopped at Wed May 14 13:49:33 2008
Simulation elapsed time 1.19 (sec)

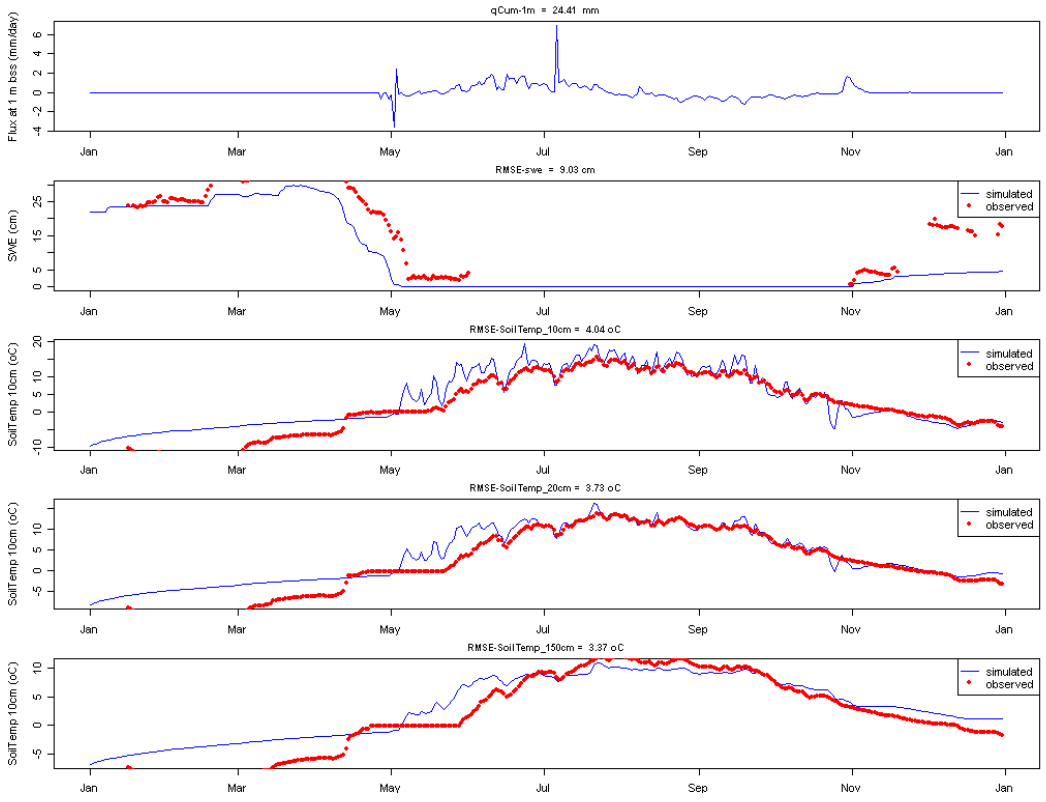
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	24.41			
2	RMSE-swe	cm	14.66	21.92	−7.26	9.03
3	RMSE-tem	oC	9.97	1.59	6.52	11.15



Figuur 30: SnowFrost(Boreas)

Tabel 125: Waterbalans

	1
ipl	1.00
yr	1994.00
Igrai	247.00
Igsnow	167.00
Igirr	0.00
RunOn	0.00
fldrin1	0.00
fldrin2	0.00
fldrin3	0.00
flindr4	0.00
fldrin5	0.00
flbtin	19.00
evicpr	−62.00
evicir	0.00
evso	−43.00
evsubl	−160.00
evpn	0.00
flev	−492.00
runoff	−135.00
fldrou1	0.00
fldrou2	0.00
fldrou3	0.00
fldrou4	0.00
fldrou5	0.00
flbtou	−78.00
deltast	332.00
deltapn	0.00
deltasnow	175.00
badev	−30.00
evsoma	−102.00
evtrma	−573.00

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	
drainage	
irrigation	
bottomboundary	
reference	Schoumans et al ()

Project: run.319.2.swap
File name: run.319.2.swap.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:49:35 2008
Simulation stopped at Wed May 14 13:49:56 2008
Simulation elapsed time 21.12 (sec)

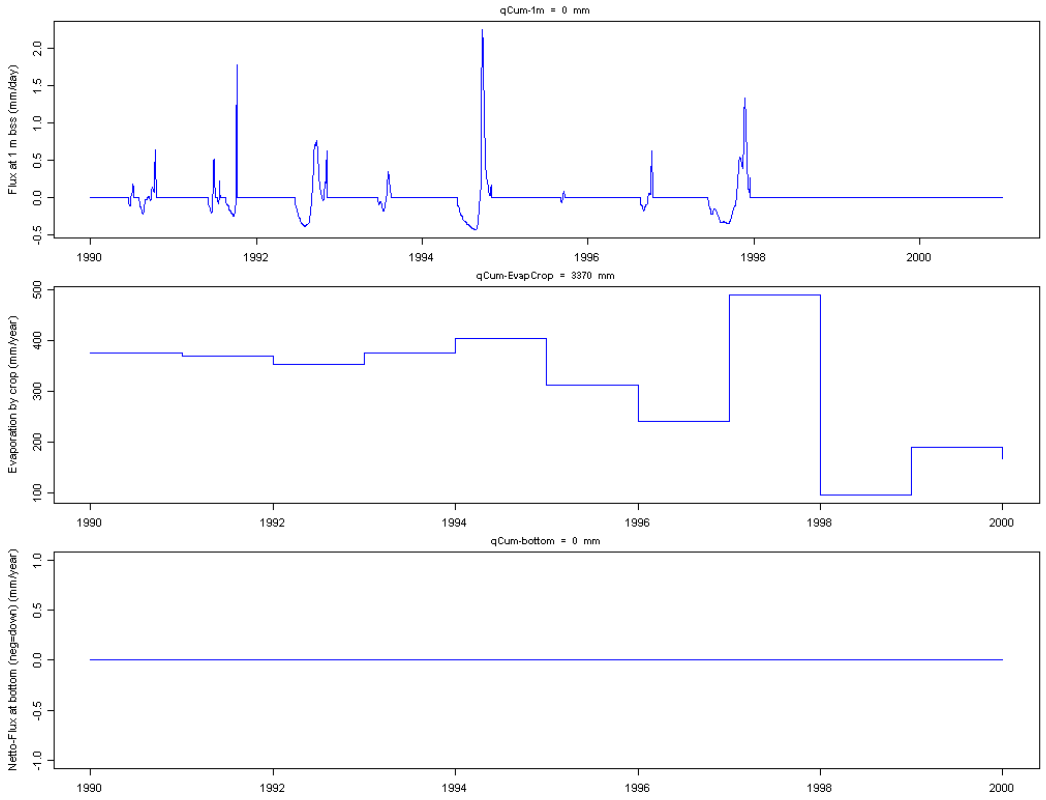
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	0.00			
2	qCum-EvapCrop	mm	3370.00			
3	qCum-bottom	cm	0.00			



Figuur 31: SnowFrost(EuroHarpNOV)

Tabel 129: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1990.00	1991.00	1992.00	1993.00	1994.00	1995.00	1996.00	1997.00	1998.
Igrai	820.00	684.00	573.00	632.00	512.00	612.00	589.00	529.00	696.
Igsnow	30.00	46.00	45.00	100.00	130.00	111.00	75.00	66.00	73.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−94.00	−65.00	−82.00	−75.00	−51.00	−91.00	−88.00	−69.00	−112.
evsubl	−1.00	−4.00	−2.00	−6.00	−13.00	−4.00	−10.00	−2.00	−8.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−375.00	−370.00	−352.00	−376.00	−403.00	−312.00	−240.00	−490.00	−95.
runoff	−419.00	−307.00	−300.00	−263.00	−366.00	−382.00	−359.00	−99.00	−584.
fldrou1	−18.00	−19.00	−19.00	−16.00	−16.00	−22.00	−17.00	−4.00	−37.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltast	−1.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	−25.
deltapn	0.00	1.00	0.00	−2.00	−1.00	3.00	0.00	3.00	−3.
deltasnow	27.00	0.00	0.00	−63.00	63.00	−2.00	−8.00	−14.00	25.
badev	−30.00	−35.00	−138.00	−69.00	−146.00	−88.00	−59.00	−56.00	−71.
evsoma	−130.00	−114.00	−123.00	−115.00	−109.00	−127.00	−112.00	−122.00	−122.
evtrma	−475.00	−433.00	−455.00	−429.00	−476.00	−440.00	−417.00	−520.00	−376.

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	
drainage	
irrigation	
bottomboundary	
reference	Garcia ()

Project: BareSoil
File name: BareSoil.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:49:58 2008
Simulation stopped at Wed May 14 13:50:15 2008
Simulation elapsed time 17.71 (sec)

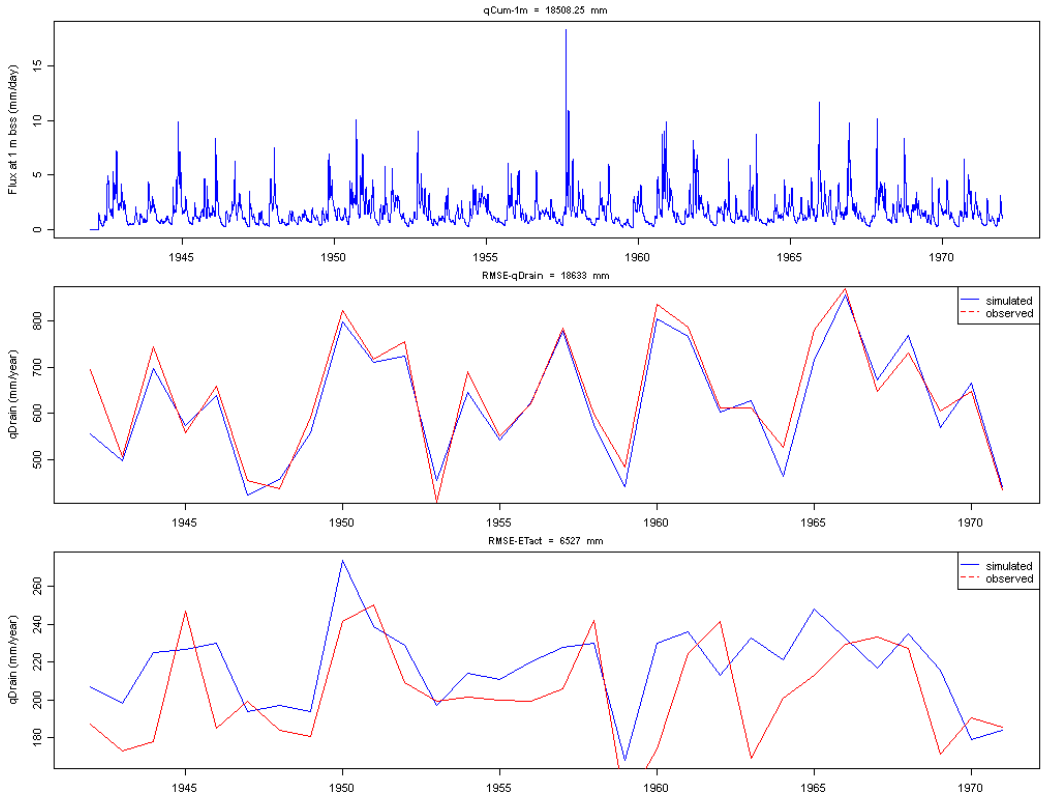
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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	18508.25			
2	RMSE-qDrain	mm	18633.00	19160.29	−17.58	39.70
3	RMSE-ETact	mm	6527.00	6087.81	14.64	26.95



Figuur 32: SoilEvaporation(Castricum)

Tabel 133: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1942.00	1943.00	1944.00	1945.00	1946.00	1947.00	1948.00	1949.00	1950.
Igrai	833.00	671.00	915.00	778.00	825.00	530.00	618.00	771.00	1049.
Igsnow	41.00	7.00	4.00	22.00	16.00	87.00	2.00	2.00	10.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−207.00	−198.00	−225.00	−226.00	−229.00	−175.00	−197.00	−194.00	−273.
evsubl	0.00	0.00	0.00	−1.00	−1.00	−19.00	0.00	0.00	−1.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
runoff	−18.00	0.00	0.00	0.00	0.00	−20.00	0.00	0.00	0.
fldrou1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	−538.00	−496.00	−696.00	−574.00	−639.00	−403.00	−457.00	−557.00	−797.
deltast	−119.00	16.00	0.00	−3.00	26.00	−34.00	30.00	−22.00	6.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	−4.00	4.00	0.00	−1.
badev	−8.00	−1.00	−1.00	−5.00	−3.00	−37.00	−1.00	0.00	−6.
evsoma	−644.00	−663.00	−637.00	−613.00	−642.00	−718.00	−663.00	−659.00	−639.
evtrma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.

35 TimingErrorEndofDay

Tabel 134: Description of case

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

Project: 1.swap
File name: 1.swap.swp
Model version: Swap 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:50:18 2008
Simulation stopped at Wed May 14 13:50:20 2008
Simulation elapsed time 2.31 (sec)

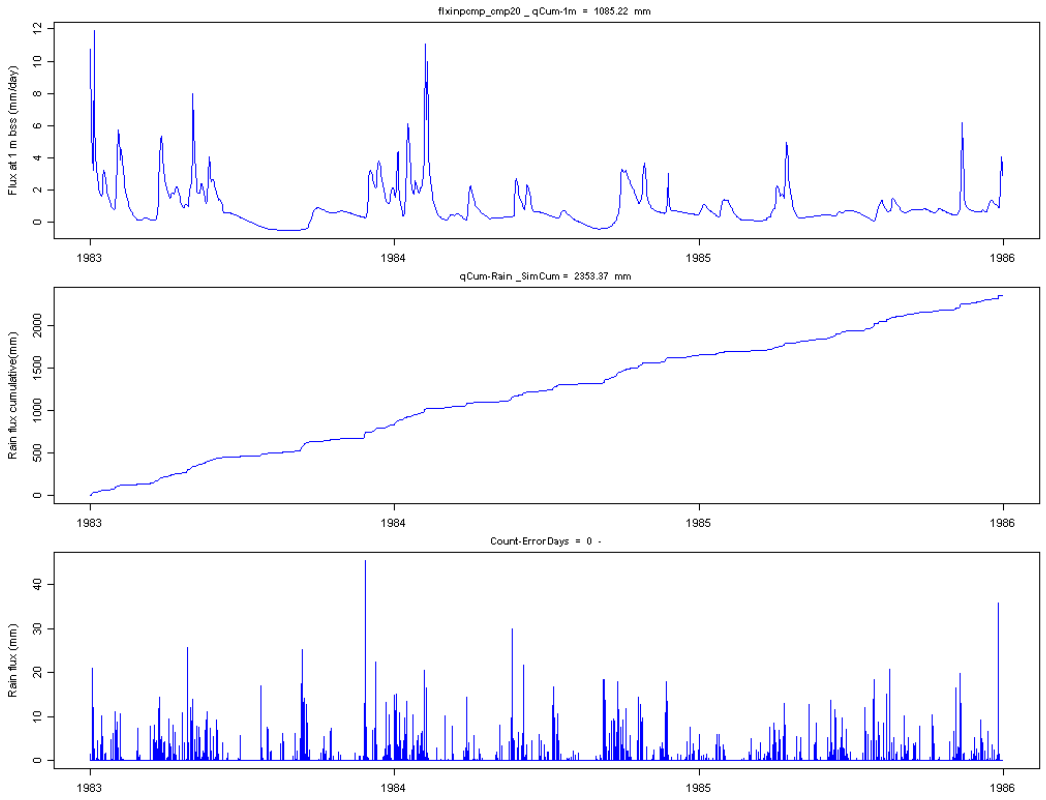
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

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: Waterbalans

values	none



Figuur 33: TimingErrorEndofDay

36 TranspirationDecForest(Castricum)

Tabel 137: 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 3.2 (revision 11) (Date 14 May 2008)

Simulation started at Wed May 14 13:50:21 2008
Simulation stopped at Wed May 14 13:50:41 2008
Simulation elapsed time 19.26 (sec)

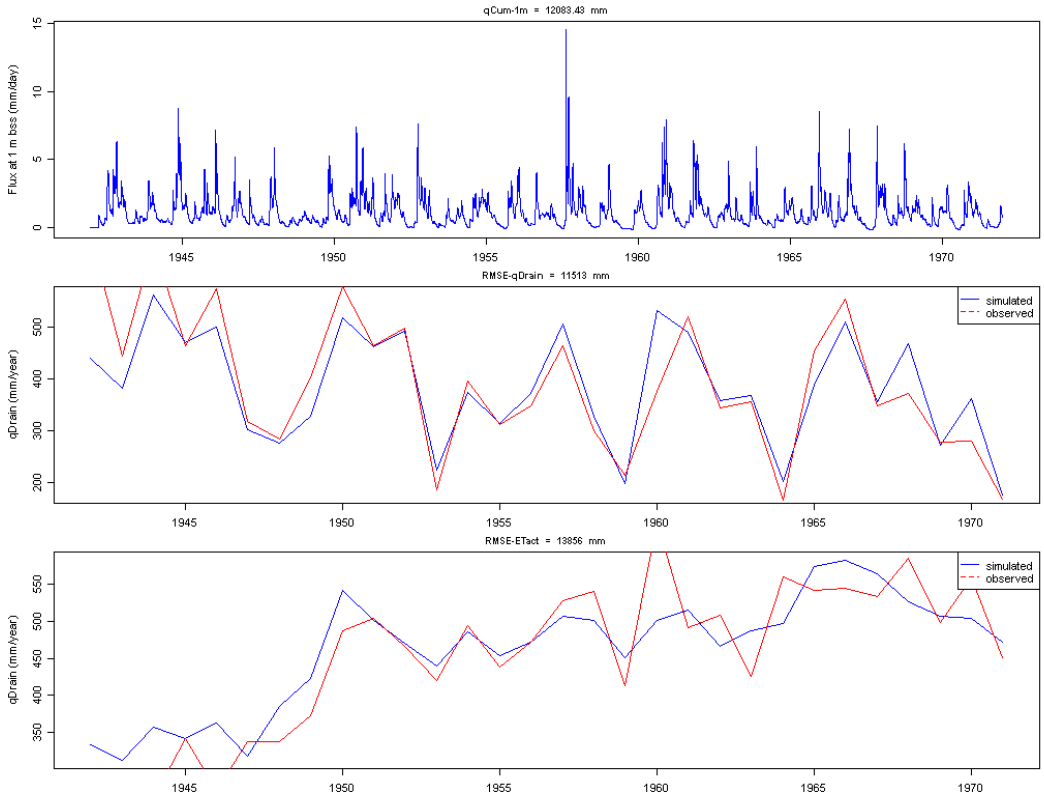
Succesfull completion of simulation: yes
Succesfull closure of water balance: yes

Tabel 138: 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 139: Statistics of Performance Indices

	PIname	PIunit	SIM	OBS	ME	RMSE
1	qCum-1m	mm	12083.43			
2	RMSE-qDrain	mm	11513.00	11784.00	−9.03	68.30
3	RMSE-ETact	mm	13856.00	13464.10	13.06	55.12



Figuur 34: TranspirationDecForest(Castricum)

Tabel 140: Waterbalans

	1	2	3	4	5	6	7	8	
ipl	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
yr	1942.00	1943.00	1944.00	1945.00	1946.00	1947.00	1948.00	1949.00	1950.
Igrai	835.00	671.00	915.00	778.00	825.00	530.00	618.00	771.00	1049.
Igsnow	41.00	7.00	4.00	22.00	16.00	87.00	2.00	2.00	10.
Igirr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
RunOn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flindr4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrin5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evicpr	−140.00	−146.00	−166.00	−155.00	−152.00	−117.00	−168.00	−192.00	−252.
evicir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
evso	−161.00	−145.00	−171.00	−167.00	−171.00	−132.00	−146.00	−141.00	−171.
evsubl	−13.00	0.00	0.00	−1.00	−1.00	−20.00	0.00	0.00	−1.
evpn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flev	−19.00	−21.00	−20.00	−18.00	−38.00	−48.00	−71.00	−90.00	−118.
runoff	−8.00	0.00	0.00	0.00	0.00	−15.00	0.00	0.00	0.
fldrou1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
fldrou5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
flbtou	−432.00	−381.00	−561.00	−470.00	−500.00	−286.00	−276.00	−328.00	−517.
deltast	−108.00	14.00	−3.00	8.00	20.00	−32.00	36.00	−23.00	−6.
deltapn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
deltasnow	0.00	0.00	0.00	0.00	0.00	−4.00	4.00	0.00	−1.
badev	−6.00	−1.00	−1.00	−5.00	−3.00	−37.00	−1.00	0.00	−6.
evsoma	−548.00	−558.00	−525.00	−495.00	−510.00	−598.00	−492.00	−465.00	−379.
evtrma	−20.00	−21.00	−20.00	−18.00	−38.00	−49.00	−71.00	−90.00	−124.