

SWAP 3.0 Case Studies - testreport

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Alterra-TestReport SWAP 3.0.2 Case Studies.doc

Alterra, Green World Research, Wageningen, 2003

Contents

1	Introduction.....	5
2	Hupsel.....	7
	2.1 Refence situation	7
	2.2 Hysteresis considered	9
3	Grassland.....	10
	3.1 Cranendonk experimental field site	10
	3.2 Ruurlo experimental field site	14
4	Forage maize at Cranendonk experimental field site.....	16
5	Wildenborch, surface water module included	18
6	Speuld, forest interception included.....	20
7	BOREAS site, snow and frost included	22
8	Castricum lysimeters.....	24
	8.1 Bare soil	24
	8.2 Oak trees	26

1 Introduction

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

Of each case the following is reported:

1. a short description;
2. whether simulation was successfully completed
3. mass balance of water (and when relevant of solutes), including an average value for a quick interpretation of results (e.g. average leaching at 1m)

2 Hupsel

2.1 Refence situation

Short description of case:

Hupsel simulation with salt

Simulation successfully completed

Y

Water and salt balance

For the simulation period of 1 year:

```
* Project:      Hupsel
* File content: overview of actual water and solute balance components
* File name:    Result.bal
* Model version: swap_3_0_3
* Generated at: 06-Jan-2004 09:15:36
```

```
Period          : 01-Jan-1980 until 31-Dec-1980
Depth soil profile : 200.00 cm
```

	Water storage	Solute storage
Final :	71.66 cm	0.4604E+03 mg/cm2
Initial :	72.07 cm	0.0000E+00 mg/cm2
Change	-0.41 cm	0.4604E+03 mg/cm2

Water balance components (cm)

In		Out	
Rain	: 66.01	Interception	: 4.52
Runon	: 0.00	Runoff	: 0.00
Irrigation	: 0.50	Transpiration	: 26.56
Bottom flux	: 0.00	Soil evaporation	: 14.42
		Crack flux	: 0.00
		Drainage level 1	: 21.42
Sum	: 66.51	Sum	: 66.93

Solute balance components (mg/cm2)

In		Out	
Rain	: 0.0000E+00	Decomposition	: 0.0000E+00
Irrigation	: 0.5000E+03	Root uptake	: 0.0000E+00
Bottom flux	: 0.0000E+00	Cracks	: 0.0000E+00
		Drainage	: 0.3964E+02
Sum	: 0.5000E+03	Sum	: 0.3964E+02

Water balance

For the simulation period of 2 years:

* Project: Hupsel
 * File content: overview of actual water balance components (cm)
 * File name: Result.blc
 * Model version: swap_3_0_3
 * Generated at: 06-Jan-2004 09:15:36

Period : 01-Jan-1980 until 31-Dec-1980
 Depth soil profile : 200.00 cm

INPUT					OUTPUT				
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		0.00	0.00	72.07	Finally present		0.00	0.00	71.66
Gross Rainfall	66.01				Nett Rainfall	61.49			
Nett Rainfall		0.00	61.49		Nett Irrigation	0.50			
Gross Irrigation	0.50				Interception	4.52			
Nett Irrigation			0.50						
Snowfall		0.00			Snowmelt		0.00		
Snowmelt			0.00		Sublimation		0.00		
					Plant Evaporation				26.56
					Soil Evaporation			14.42	
Runon			0.00		Runoff			0.00	
Inundation			0.00						
Infiltr. Soil Surf.				55.14	Infiltr. Soil Surf.			55.14	
Exfiltr. Soil Surf.			7.57		Exfiltr. Soil Surf.				7.57
Infiltr. subsurf.					Drainage				
- system 1				0.00	- system 1				21.42
Upward seepage				0.00	Downward seepage				0.00
Sum	66.51	0.00	69.56	127.21	Sum	66.51	0.00	69.56	127.21
Storage Change		0.00	0.00	-0.41					
Balance Deviation	0.00	0.00	0.00	0.00					

Period : 01-Jan-1981 until 31-Dec-1981
 Depth soil profile : 200.00 cm

INPUT					OUTPUT				
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		0.00	0.00	71.66	Finally present		0.00	0.00	73.38
Gross Rainfall	79.89				Nett Rainfall	78.48			
Nett Rainfall		0.00	78.48		Nett Irrigation	0.00			
Gross Irrigation	0.00				Interception	1.41			
Nett Irrigation			0.00						
Snowfall		0.00			Snowmelt		0.00		
Snowmelt			0.00		Sublimation		0.00		
					Plant Evaporation				21.56
					Soil Evaporation			17.57	
Runon			0.00		Runoff			0.29	
Inundation			0.00						
Infiltr. Soil Surf.				68.99	Infiltr. Soil Surf.			68.99	
Exfiltr. Soil Surf.			8.37		Exfiltr. Soil Surf.				8.37
Infiltr. subsurf.					Drainage				
- system 1				0.00	- system 1				37.34
Upward seepage				0.00	Downward seepage				0.00
Sum	79.89	0.00	86.85	140.65	Sum	79.89	0.00	86.86	140.65
Storage Change		0.00	0.00	1.72					
Balance Deviation	0.00	0.00	0.00	0.00					

2.2 Hysteresis considered

Short description of case:

Hupsel simulation with hystereses

Simulation successfully completed

Y

Water balance

For the simulation period of 1 year:

```

* Project:      HupselHyst
* File content: overview of actual water balance components (cm)
* File name:    Result.blc
* Model version: swap_3_0_3
* Generated at: 24-Nov-2003 15:36:11

Period          : 01-Jan-1980 until 31-Dec-1980
Depth soil profile : 200.00 cm
=====
INPUT          | OUTPUT
=====+=====
                PLANT  SNOW  POND  SOIL |                PLANT  SNOW  POND  SOIL
=====+=====
Initially Present | Finally present
Gross Rainfall   66.01 |                0.00  0.00  70.24
Nett Rainfall    0.00 | Nett Rainfall   61.49
Gross Irrigation  0.50 |                |
Nett Irrigation  | Nett Irrigation 0.50
                | Interception    4.52
Snowfall         0.00 |                |
Snowmelt         | Snowmelt        0.00
                | Sublimation     0.00
                | Plant Evaporation
                | Soil Evaporation 14.42
                | Runoff          0.00
Runon            0.00 |                |
Inundation       0.00 |                |
Infiltr. Soil Surf. | Infiltr. Soil Surf.
Exfiltr. Soil Surf. | Exfiltr. Soil Surf.
Infiltr. subsurf.  | Drainage
- system 1        | - system 1
Upward seepage   0.00 | Downward seepage
                |                0.00
=====+=====
Sum              66.51  0.00  69.56 127.21 | Sum              66.51  0.00  69.56 127.21
=====+=====
Storage Change   0.00  0.00  0.00 -1.83
Balance Deviation 0.00  0.00  0.00  0.00
=====+=====

```

3 Grassland

3.1 Cranendonk experimental field site

Short description of case:

- location: Cranendonck
 - period: 01-01-1992 t/m 31-12-2001
- (Changes relative to Swap3.0.2: period extended and drainage improved)

Simulation successfully completed

Y

Water balance year all years

```

* * Project:      CranGras
* * File content: formatted hydrological data
* * File name:    Result.bfo
* * Model version: swap_3_0_3
* * Generated at: 06-Jan-2004 09:20:55
*
* Yearly output on water balance in top 1 metre of profile:
*
* RAIN = Rainfall
* IRRIG = Irrigation
* EVICPR = Evaporation by interception of rainfall
* EVICIR = Evaporation by interception of irrigation
* SEVP = Soil Evaporation
* PTRA = Plant transpiration
* PCBT = percolation at bottom
* RUNO = Run-off
* STOR = Storage
* DRA1 = Lateral drainage for level 1
* DRA2 = Lateral drainage for level 2
* DRA3 = Lateral drainage for level 3
*
*-----*
* Year  RAIN  IRRI  STOR  EVICPR  EVICIR  SEVP  PTRA  RUNO  PRBT  DRA-1  DRA-2  DRA-3
*-----*
1992  679.   0.   -4.   85.     0.    95.  398.   0.   87.   18.    0.    0.
1993  743.   0.   61.   89.     0.    81.  372.   2.  108.  23.    0.    0.
1994  743.   0.  -54.   92.     0.    94.  399.  15.  164.  41.    0.    0.
1995  664.   0.  -47.   90.     0.    83.  420.  19.   56.  43.    0.    0.
1996  587.   0.   31.   77.     0.    88.  382.   2.    2.   5.    0.    0.
1997  692.   0.  -17.   84.     0.   101.  418.   0.   94.  11.    0.    0.
1998  892.   0.   48.  111.     0.    87.  333.   0.  275.  37.    0.    0.
1999  811.   0.    5.  100.     0.    97.  415.   0.  151.  43.    0.    0.
2000  774.   0.  -39.  108.     0.    93.  369.   0.  211.  33.    0.    0.
2001  844.   0.   26.  110.     0.    94.  397.   0.  176.  41.    0.    0.
*
* Percolation average over years ..... 132.4643 mm/year

```

Water balance years 1997 and 1998

* Project: CranGras
 * File content: overview of actual water balance components (cm)
 * File name: Result.blc
 * Model version: swap_3_0_3
 * Generated at: 06-Jan-2004 09:20:57

.....

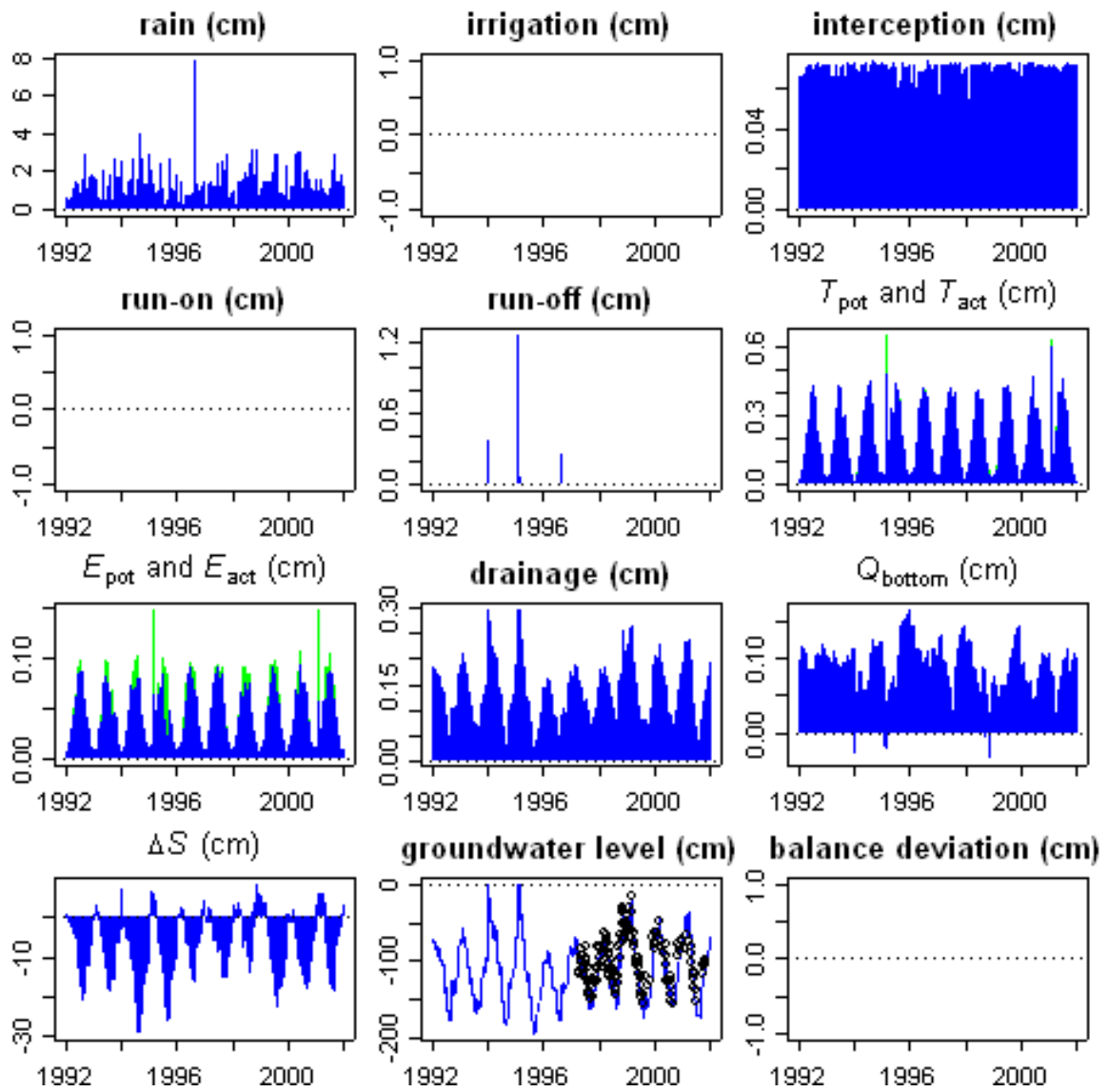
Period : 01-Jan-1997 until 31-Dec-1997
 Depth soil profile : 290.00 cm

INPUT					OUTPUT				
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		0.00	0.00	102.97	Finally present		0.00	0.00	101.25
Gross Rainfall	69.20				Nett Rainfall	60.81			
Nett Rainfall		0.00	60.81		Interception	8.39			
Snowfall		0.00			Snowmelt		0.00		
Snowmelt			0.00		Sublimation		0.00		
					Plant Evaporation				41.81
					Soil Evaporation			10.15	
Runon			0.00		Runoff			0.00	
Inundation			0.00		Infiltr. Soil Surf.			57.25	
Infiltr. Soil Surf.				57.25	Exfiltr. Soil Surf.				6.59
Exfiltr. Soil Surf.			6.59		Drainage				
Infiltr. subsurf.					- system 1				42.89
- system 1				0.00	Upward seepage				0.00
Upward seepage				32.32	Downward seepage				
Sum	69.20	0.00	67.40	192.54	Sum	69.20	0.00	67.40	192.54
Storage Change		0.00	0.00	-1.72					
Balance Deviation	0.00	0.00	0.00	0.00					

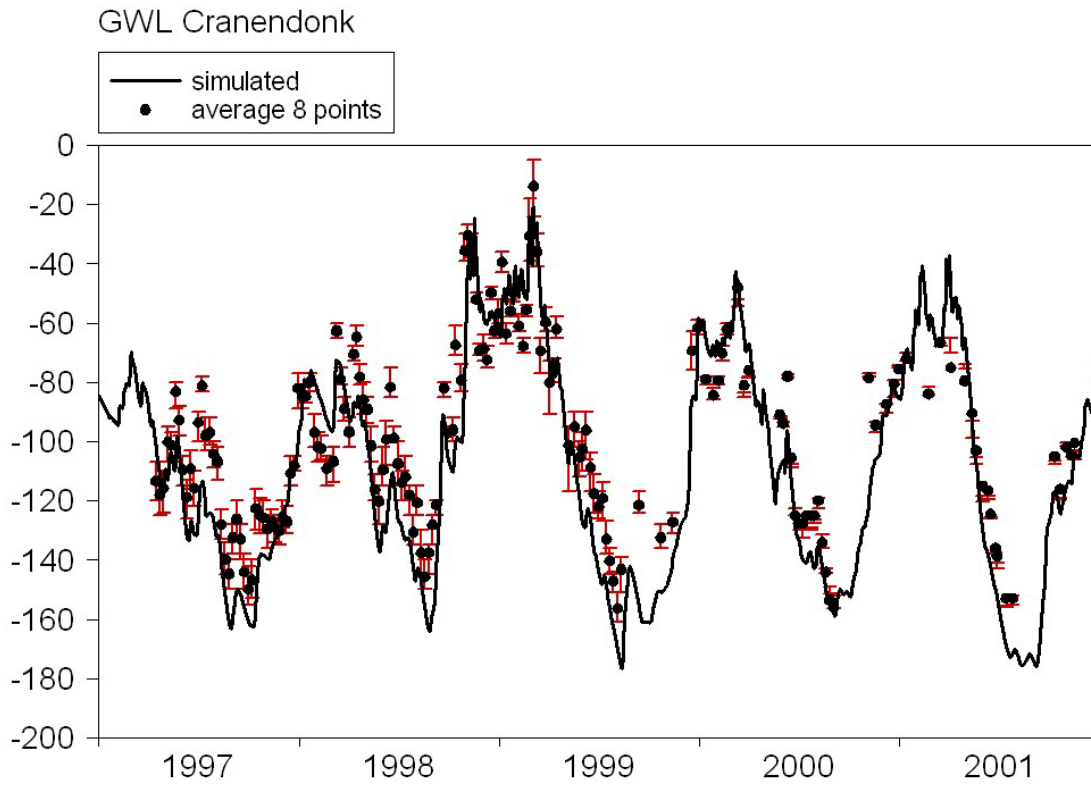
Period : 01-Jan-1998 until 31-Dec-1998
 Depth soil profile : 290.00 cm

INPUT					OUTPUT				
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		0.00	0.00	101.25	Finally present		0.00	0.00	106.10
Gross Rainfall	89.16				Nett Rainfall	78.04			
Nett Rainfall		0.00	78.04		Interception	11.12			
Snowfall		0.00			Snowmelt		0.00		
Snowmelt			0.00		Sublimation		0.00		
					Plant Evaporation				33.33
					Soil Evaporation			8.68	
Runon			0.00		Runoff			0.00	
Inundation			0.00		Infiltr. Soil Surf.			74.05	
Infiltr. Soil Surf.				74.05	Exfiltr. Soil Surf.				4.69
Exfiltr. Soil Surf.			4.69		Drainage				
Infiltr. subsurf.					- system 1				52.84
- system 1				0.00	Upward seepage				0.45
Upward seepage				22.12	Downward seepage				
Sum	89.16	0.00	82.73	197.41	Sum	89.16	0.00	82.73	197.41
Storage Change		0.00	0.00	4.85					
Balance Deviation	0.00	0.00	0.00	0.00					

Graphical overview



Graph of simulated and measured groundwaterlevel



Statistics of measured and simulated groundwaterlevels

Number of observation	=	169
Difference between average of calc and measured ..	=	-8.59
Difference between stdv of calc and measured ..	=	6.67
Average of residuals	=	8.59
Standarddeviation of residual	=	13.72
Root mean square error (standarddeviation)	=	16.15
Coefficient of determination	=	0.63
Modelling efficiency	=	0.71
Coefficient of residual mass	=	-0.09
Correlation coefficient	=	0.87
Goodness of fit	=	0.29

3.2 Ruurlo experimental field site

Short description of case:

- location: Ruurlo
- period: 01-01-1980 t/m 31-12-1984

Simulation successfully completed

Y

Water balance

```
* * Project:      Ruurlo
* * File content: formatted hydrological data
* * File name:    Result.bfo
* * Model version: swap_3_0_3
* * Generated at: 06-Jan-2004 09:58:48
```

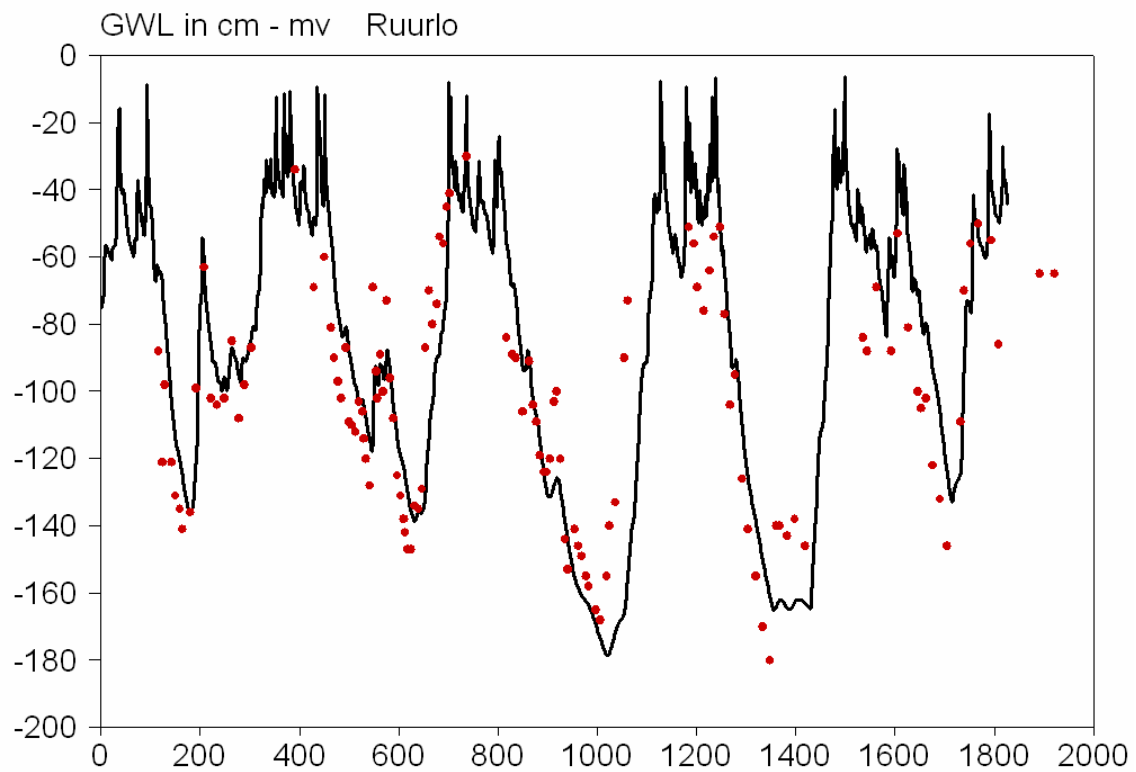
```
* Yearly output on water balance in top 1 metre of profile:
```

```
*
* RAIN = Rainfall
* IRRIG = Irrigation
* EVICPR = Evaporation by interception of rainfall
* EVICIR = Evaporation by interception of irrigation
* SEVP = Soil Evaporation
* PTRA = Plant transpiration
* PCBT = percolation at bottom
* RUNO = Run-off
* STOR = Storage
* DRA1 = Lateral drainage for level 1
* DRA2 = Lateral drainage for level 2
* DRA3 = Lateral drainage for level 3
```

* Year	RAIN	IRRI	STOR	EVICPR	EVICIR	SEVP	PTRA	RUNO	PRBT	DRA-1	DRA-2	DRA-3
1980	743.	0.	35.	95.	0.	88.	352.	0.	169.	4.	0.	0.
1981	805.	0.	3.	100.	0.	87.	336.	0.	273.	6.	0.	0.
1982	616.	0.	-59.	85.	0.	91.	401.	0.	95.	3.	0.	0.
1983	763.	0.	2.	66.	0.	92.	378.	0.	220.	5.	0.	0.
1984	744.	0.	53.	73.	0.	78.	311.	0.	223.	5.	0.	0.

```
Percolation average over years ..... 196.2648 mm/year
```

Graph of simulated and measured groundwaterlevel



Statistics of measured and simulated groundwaterlevels

Number of observation	=	126
Difference between average of calc and measured	=	3.52
Difference between stdv of calc and measured	=	6.41
Average of residuals	=	-3.52
Standarddeviation of residual	=	22.11
Root mean square error (standarddeviation)	=	22.30
Coefficient of determination	=	0.70
Modelling efficiency	=	0.54
Coefficient of residual mass	=	0.03
Correlation coefficient	=	0.69
Goodness of fit	=	0.46

4 Forage maize at Cranendonck experimental field site

Short description of case:

- location: Cranendonck
- period: 01-01-1974 t/m 31-12-1982

Simulation successfully completed

Y

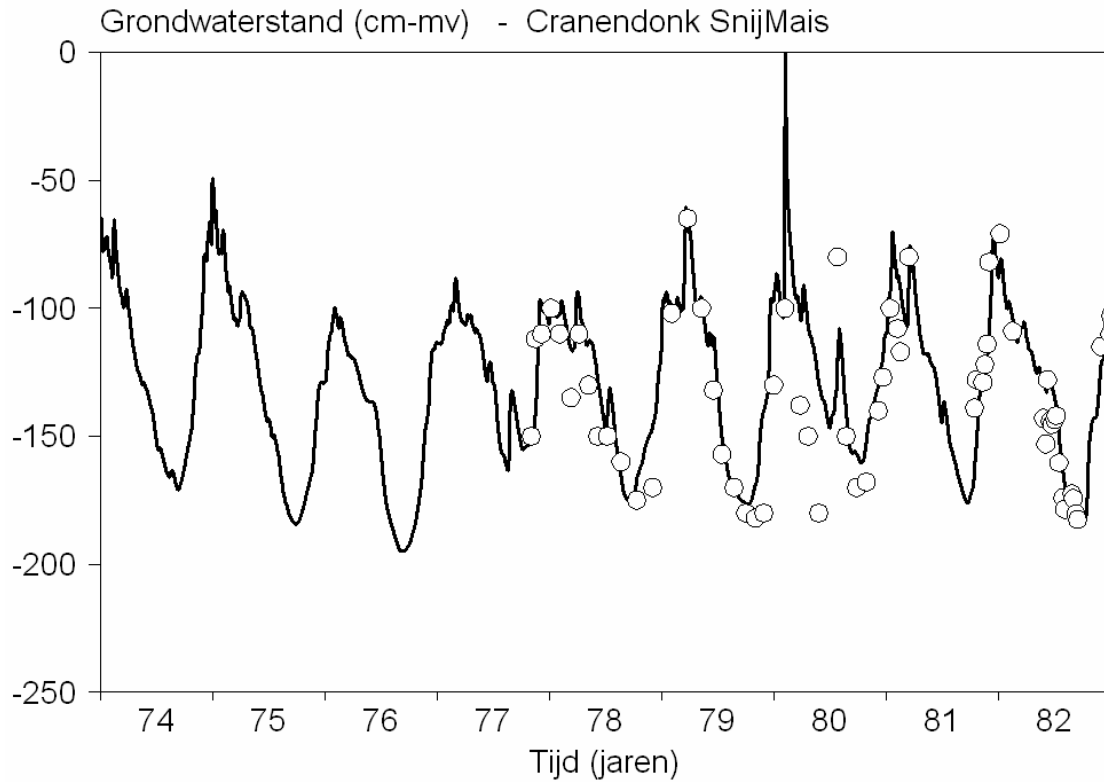
Water balance

```

* * Project:          CranMais
* * File content:    formatted hydrological data
* * File name:       Result.bfo
* * Model version:   swap_3_0_3
* * Generated at:    17-Nov-2003 16:50:20
*
* Yearly output on water balance in top 1 metre of profile:
*
* RAIN = Rainfall
* IRRIG = Irrigation
* EVICPR = Evaporation by interception of rainfall
* EVICIR = Evaporation by interception of irrigation
* SEVP = Soil Evaporation
* PTRA = Plant transpiration
* PCBT = percolation at bottom
* RUNO = Run-off
* STOR = Storage
* DRA1 = Lateral drainage for level 1
* DRA2 = Lateral drainage for level 2
* DRA3 = Lateral drainage for level 3
*
*-----*
* Year  RAIN  IRRI  STOR  EVICPR  EVICIR  SEVP  PTRA  RUNO  PRBT  DRA-1  DRA-2  DRA-3
*-----*
1974  822.   0.   15.   53.    0.   160.  257.   0.  337.   0.    0.    0.
1975  590.   0.  -111.  31.    0.  166.  323.   0.  181.   0.    0.    0.
1976  492.   0.   24.   32.    0.  139.  311.   0.  -15.   0.    0.    0.
1977  809.   0.   29.   37.    0.  157.  241.  32.  312.   0.    0.    0.
1978  615.   0.    7.   36.    0.  149.  248.   0.  175.   0.    0.    0.
1979  727.   0.    4.   36.    0.  171.  252.   0.  264.   0.    0.    0.
1980  792.   0.  -32.   45.    0.  150.  259.  25.  345.   0.    0.    0.
1981  811.   0.   42.   44.    0.  157.  251.   0.  318.   0.    0.    0.
1982  645.   0.  -25.   46.    0.  162.  287.   0.  175.   0.    0.    0.
*-----*
Percolation average over years ..... 232.3422 mm/year

```


Graph of simulated and measured groundwaterlevel



Statistics of measured and simulated groundwaterlevels

Number of observation	=	61
Difference between average of calc and measured ..	=	7.36
Difference between stdv of calc and measured ..	=	-0.86
Average of residuals	=	-7.36
Standarddeviation of residual	=	17.56
Root mean square error (standarddeviation)	=	18.90
Coefficient of determination	=	1.00
Modelling efficiency	=	0.63
Coefficient of residual mass	=	0.05
Correlation coefficient	=	0.70
Goodness of fit	=	0.37

5 Wildenborch, surface water module included

Short description of case:

- Wildenborch
- period: 01-01-1997 t/m 31-12-1999

Simulation successfully completed

Y (Incl Runon – test, see water balance of 2nd year)

Water balance

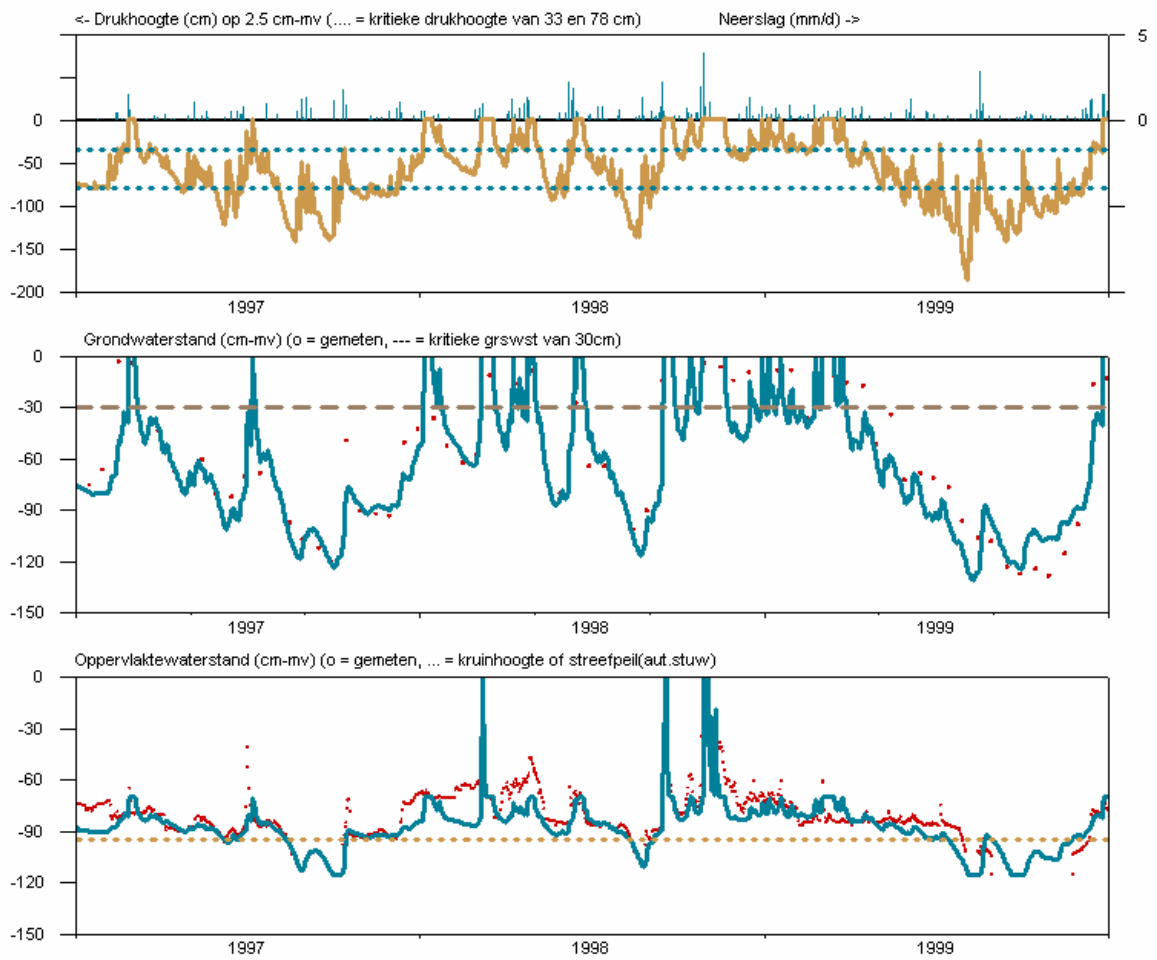
* Project: Wildenborch
 * File content: overview of actual water balance components (cm)
 * File name: Result.blc
 * Model version: swap_3_0_3
 * Generated at: 03-Nov-2003 14:50:25

Period : 01-Jan-1997 until 31-Dec-1997
 Depth soil profile : 405.00 cm

INPUT					OUTPUT				
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		0.00	0.00	144.19	Finally present		0.00	0.00	146.55
Gross Rainfall	67.52				Nett Rainfall	59.01			
Nett Rainfall		0.00	59.01		Interception	8.51			
Snowfall		0.00			Snowmelt		0.00		
Snowmelt			0.00		Sublimation		0.00		
					Plant Evaporation				39.77
					Soil Evaporation			9.23	
Runon			0.00		Runoff			0.00	
Inundation			0.00		Infiltr. Soil Surf.			55.50	
Infiltr. Soil Surf.				55.50	Exfiltr. Soil Surf.				5.71
Exfiltr. Soil Surf.			5.71		Drainage				
Infiltr. subsurf.					- system 1				14.09
- system 1				0.12	- system 2				1.05
- system 2				0.00	Downward seepage				1.79
Upward seepage				9.15					
Sum	67.52	0.00	64.72	208.96	Sum	67.52	0.00	64.73	208.96
Storage Change		0.00	0.00	2.36					
Balance Deviation	0.00	0.00	0.00	0.00					

Period : 01-Jan-1998 until 31-Dec-1998
 Depth soil profile : 405.00 cm

INPUT					OUTPUT				
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		0.00	0.00	146.55	Finally present		0.00	0.00	148.10
Gross Rainfall	105.32				Nett Rainfall	93.71			
Nett Rainfall		0.00	93.71		Interception	11.61			
Snowfall		0.00			Snowmelt		0.00		
Snowmelt			0.00		Sublimation		0.00		
					Plant Evaporation				27.16
					Soil Evaporation			8.51	
Runon			12.31		Runoff			26.47	
Inundation			0.00		Infiltr. Soil Surf.			75.10	
Infiltr. Soil Surf.				75.10	Exfiltr. Soil Surf.				4.04
Exfiltr. Soil Surf.			4.04		Drainage				
Infiltr. subsurf.					- system 1				34.54
- system 1				0.06	- system 2				8.42
- system 2				0.00	Downward seepage				6.47
Upward seepage				7.02					
Sum	105.32	0.00	110.06	228.72	Sum	105.32	0.00	110.08	228.72
Storage Change		0.00	0.00	1.55					
Balance Deviation	0.00	0.00	0.02	0.00					



6 Speuld, forest interception included

* Project: Speuld
 * File content: overview of actual water balance components (cm)
 * File name: Result.blc
 * Model version: swap_3_0_3
 * Generated at: 24-Oct-2003 01:24:58

Period : 01-Jan-1988 until 31-Dec-1988
 Depth soil profile : 505.00 cm

INPUT				OUTPUT					
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		0.00	0.00	71.72	Finally present		0.00	0.00	52.48
Gross Rainfall	93.31				Nett Rainfall	59.70			
Nett Rainfall		0.00	59.70		Interception	33.61			
Snowfall		0.00			Snowmelt		0.00		
Snowmelt			0.00		Sublimation		0.00		
Runon			0.00		Plant Evaporation				32.38
Inundation			0.00		Soil Evaporation			3.53	
Infiltr. Soil Surf.				59.33	Runoff			0.00	
Exfiltr. Soil Surf.			3.16		Infiltr. Soil Surf.			59.33	
Upward seepage				0.00	Exfiltr. Soil Surf.				3.16
Sum	93.31	0.00	62.87	131.06	Downward seepage				43.03
Storage Change		0.00	0.00	-19.24	Sum	93.31	0.00	62.87	131.06
Balance Deviation	0.00	0.00	0.00	0.00					

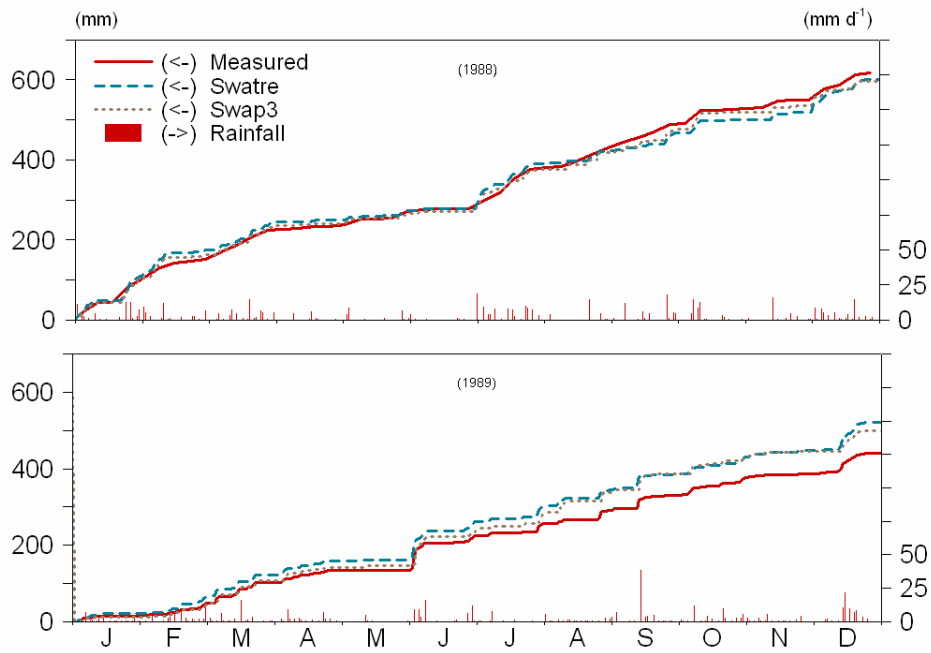
Period : 01-Jan-1989 until 31-Dec-1989
 Depth soil profile : 505.00 cm

INPUT				OUTPUT					
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		0.00	0.00	52.48	Finally present		0.00	0.00	47.66
Gross Rainfall	80.57				Nett Rainfall	49.91			
Nett Rainfall		0.00	49.91		Interception	30.66			
Snowfall		0.00			Snowmelt		0.00		
Snowmelt			0.00		Sublimation		0.00		
Runon			0.00		Plant Evaporation				38.98
Inundation			0.00		Soil Evaporation			4.32	
Infiltr. Soil Surf.				49.55	Runoff			0.00	
Exfiltr. Soil Surf.			3.95		Infiltr. Soil Surf.			49.55	
Upward seepage				0.00	Exfiltr. Soil Surf.				3.95
Sum	80.57	0.00	53.87	102.02	Downward seepage				11.43
Storage Change		0.00	0.00	-4.82	Sum	80.57	0.00	53.87	102.02
Balance Deviation	0.00	0.00	0.00	0.00					

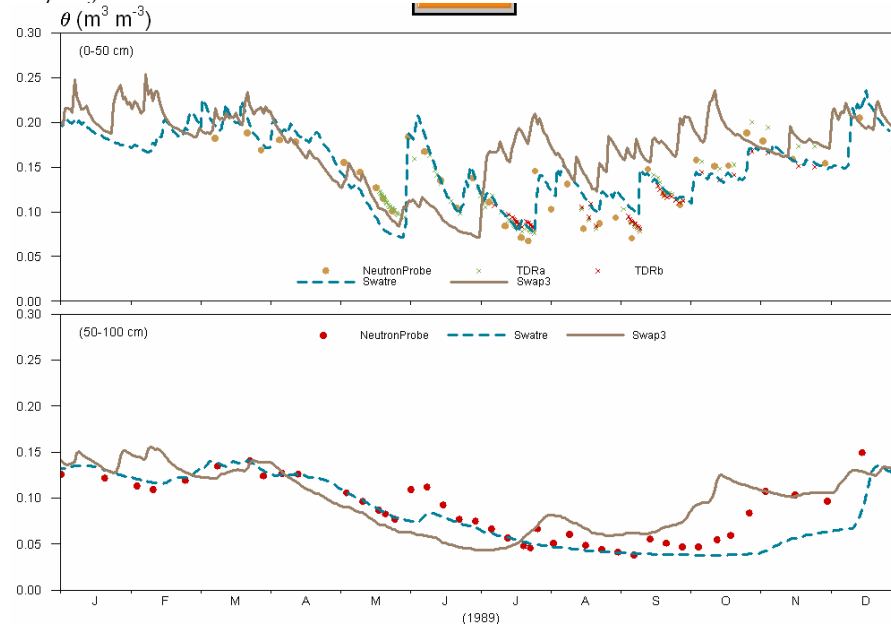
Period : 01-Jan-1991 until 31-Dec-1990
 Depth soil profile : 505.00 cm

INPUT				OUTPUT					
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		0.00	0.00	47.66	Finally present		0.00	0.00	48.49
Gross Rainfall	71.47				Nett Rainfall	43.16			
Nett Rainfall		0.00	43.16		Interception	28.31			
Snowfall		0.00			Snowmelt		0.00		
Snowmelt			0.00		Sublimation		0.00		
Runon			0.00		Plant Evaporation				30.97
Inundation			0.00		Soil Evaporation			4.25	
Infiltr. Soil Surf.				42.89	Runoff			0.00	
Exfiltr. Soil Surf.			3.98		Infiltr. Soil Surf.			42.89	
Upward seepage				0.10	Exfiltr. Soil Surf.				3.98
Sum	71.47	0.00	47.14	90.65	Downward seepage				7.21
Storage Change		0.00	0.00	0.83	Sum	71.47	0.00	47.14	90.65
Balance Deviation	0.00	0.00	0.00	0.00					

Graph of simulated and measured throughfall



Graph of simulated and measured moisture contents



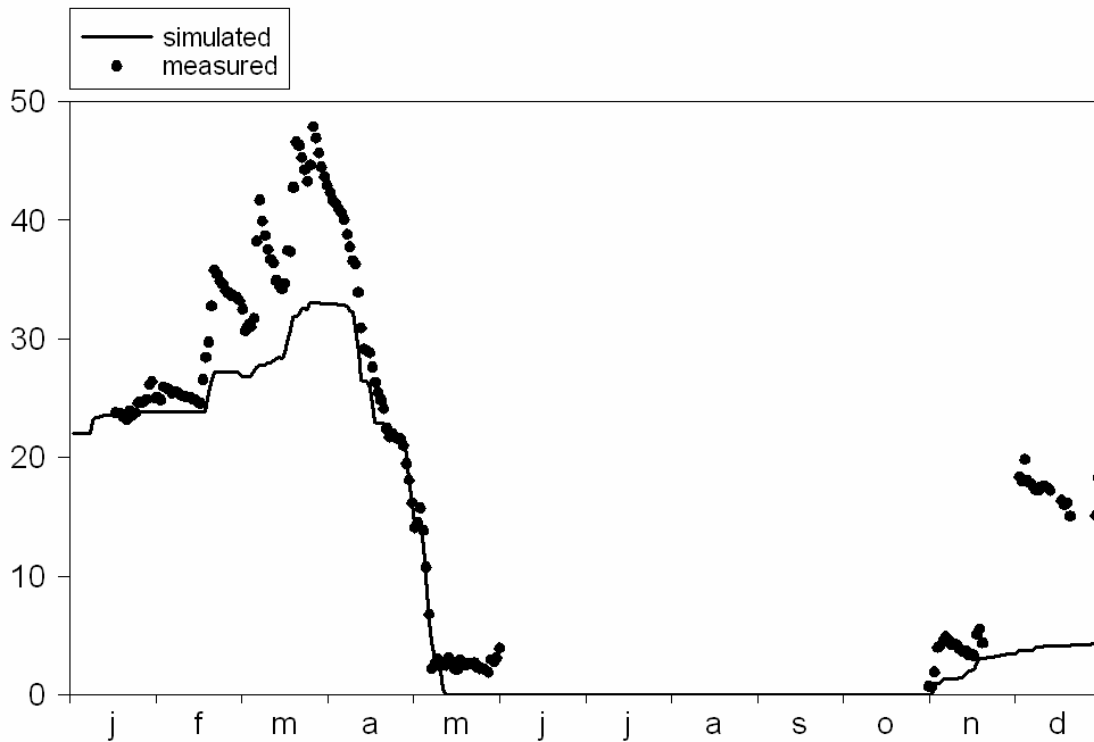
7 BOREAS site, snow and frost included

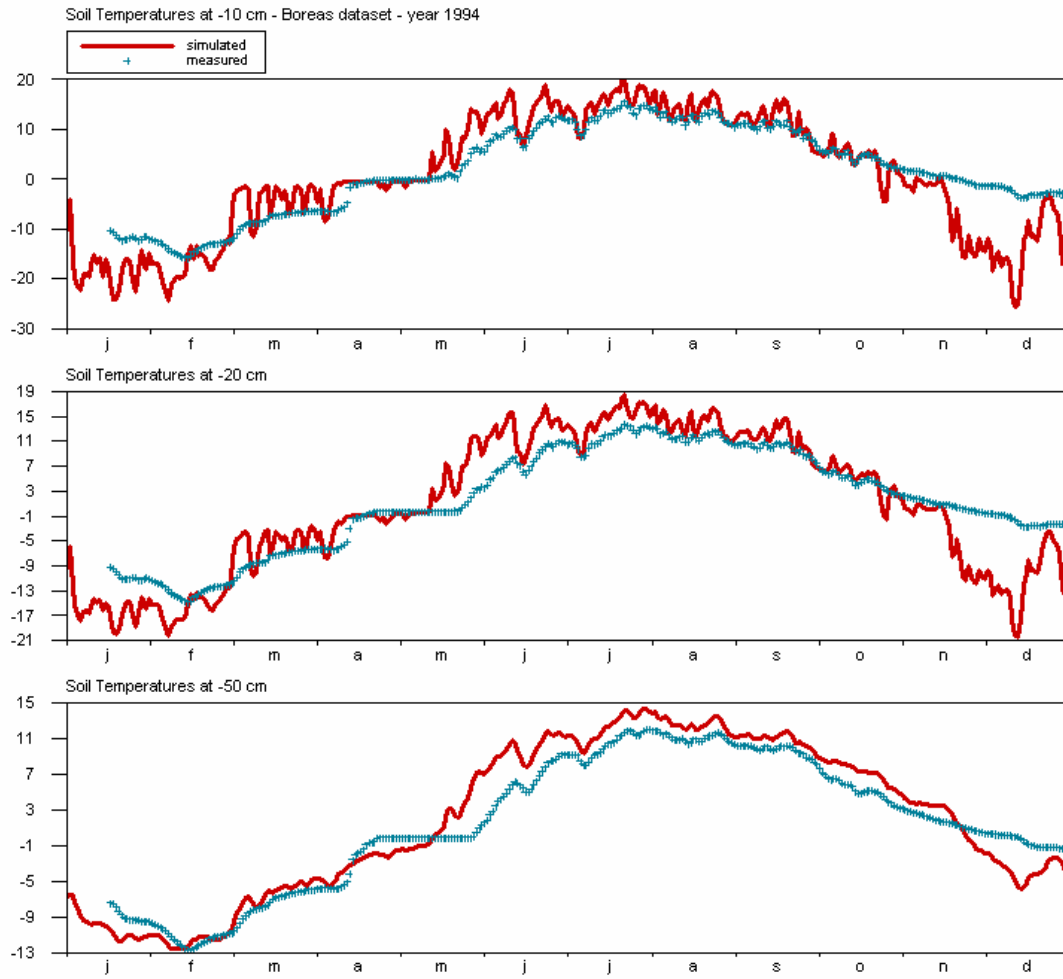
* Project: Boreas
 * File content: overview of actual water balance components (cm)
 * File name: Result.blc
 * Model version: swap_3_0_3
 * Generated at: 25-Nov-2003 21:24:32

Period : 01-Jan-1995 until 31-Dec-1994
 Depth soil profile : 1090.00 cm

INPUT				OUTPUT					
	PLANT	SNOW	POND	SOIL		PLANT	SNOW	POND	SOIL
Initially Present		22.00	0.00	525.77	Finally present		4.51	0.00	516.66
Gross Rainfall	27.47				Nett Rainfall	21.81			
Nett Rainfall		5.57	16.24		Interception	5.66			
Snowfall		16.96			Snowmelt		37.43		
Snowmelt			37.43		Sublimation		2.59		
					Plant Evaporation				31.49
					Soil Evaporation			6.54	
Runon			0.00		Runoff			17.20	
Inundation			0.00						
Infiltr. Soil Surf.				35.04	Infiltr. Soil Surf.			35.04	
Exfiltr. Soil Surf.			5.10		Exfiltr. Soil Surf.				5.10
Upward seepage				0.18	Downward seepage				7.74
Sum	27.47	44.53	58.77	560.99	Sum	27.47	44.53	58.78	560.98
Storage Change		-17.49	0.00	-9.11					
Balance Deviation	0.00	0.00	0.01	-0.01					

Boreas snow water equivalent (cm water) 1994





8 Castricum lysimeters

8.1 Bare soil

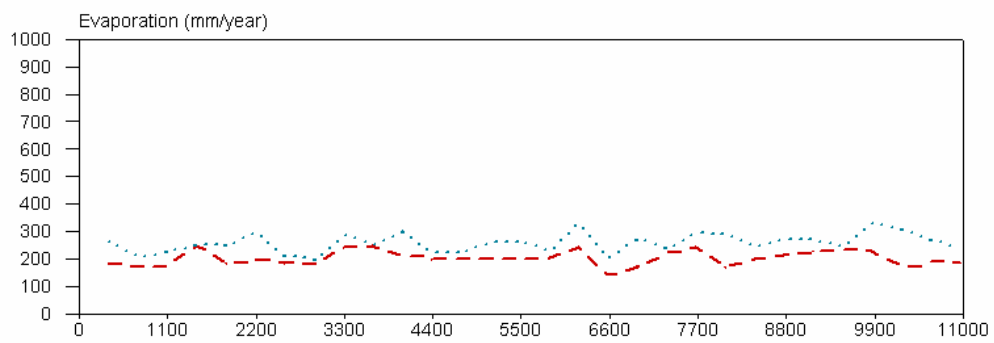
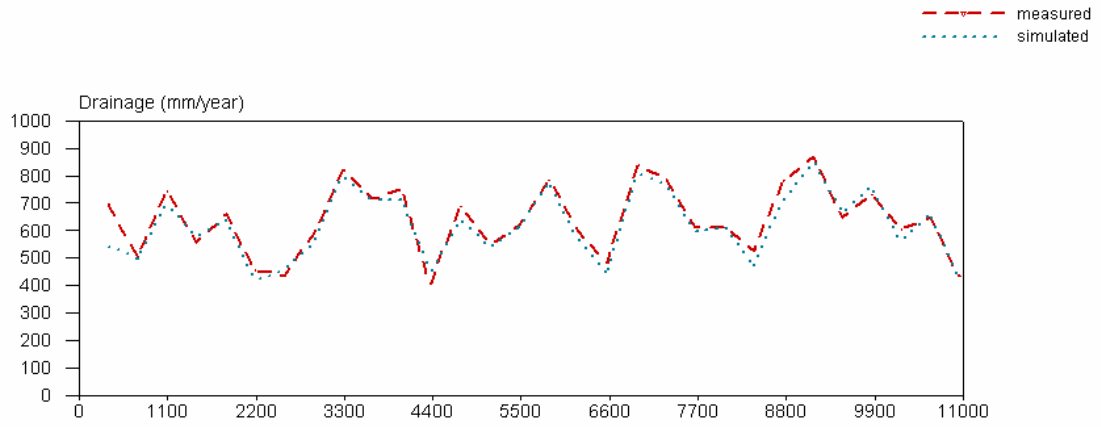
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* * Project:      BareSoil
* * File content: formatted hydrological data
* * File name:    Result.bfo
* * Model version: swap_3_0_3
* * Generated at: 06-Jan-2004 10:45:50
```

* Yearly output on water balance in top 1 metre of profile:

```
*
* RAIN = Rainfall
* IRRIG = Irrigation
* EVICPR = Evaporation by interception of rainfall
* EVICIR = Evaporation by interception of irrigation
* SEVP = Soil Evaporation
* PTRA = Plant transpiration
* PCBT = percolation at bottom
* RUNO = Run-off
* STOR = Storage
* DRA1 = Lateral drainage for level 1
* DRA2 = Lateral drainage for level 2
* DRA3 = Lateral drainage for level 3
```

* Year	RAIN	IRRI	STOR	EVICPR	EVICIR	SEVP	PTRA	RUNO	PRBT	DRA-1	DRA-2	DRA-3
1942	841.	0.	91.	0.	0.	206.	0.	7.	569.	0.	0.	0.
1943	672.	0.	-13.	0.	0.	198.	0.	0.	493.	0.	0.	0.
1944	915.	0.	-8.	0.	0.	223.	0.	0.	706.	0.	0.	0.
1945	782.	0.	17.	0.	0.	225.	0.	0.	561.	0.	0.	0.
1946	823.	0.	-27.	0.	0.	229.	0.	0.	640.	0.	0.	0.
1947	562.	0.	29.	0.	0.	175.	0.	1.	427.	0.	0.	0.
1948	617.	0.	-23.	0.	0.	198.	0.	0.	450.	0.	0.	0.
1949	772.	0.	10.	0.	0.	194.	0.	0.	569.	0.	0.	0.
1950	1060.	0.	-9.	0.	0.	275.	0.	0.	798.	0.	0.	0.
1951	961.	0.	24.	0.	0.	239.	0.	0.	704.	0.	0.	0.
1952	898.	0.	1.	0.	0.	223.	0.	8.	727.	0.	0.	0.
1953	589.	0.	-16.	0.	0.	195.	0.	0.	426.	0.	0.	0.
1954	881.	0.	12.	0.	0.	215.	0.	2.	660.	0.	0.	0.
1955	700.	0.	0.	0.	0.	208.	0.	0.	537.	0.	0.	0.
1956	778.	0.	-19.	0.	0.	219.	0.	3.	611.	0.	0.	0.
1957	990.	0.	-10.	0.	0.	228.	0.	0.	773.	0.	0.	0.
1958	729.	0.	26.	0.	0.	212.	0.	5.	578.	0.	0.	0.
1959	608.	0.	18.	0.	0.	166.	0.	0.	443.	0.	0.	0.
1960	984.	0.	-26.	0.	0.	230.	0.	1.	806.	0.	0.	0.
1961	1010.	0.	4.	0.	0.	237.	0.	0.	770.	0.	0.	0.
1962	788.	0.	3.	0.	0.	215.	0.	1.	607.	0.	0.	0.
1963	730.	0.	-26.	0.	0.	221.	0.	13.	585.	0.	0.	0.
1964	713.	0.	29.	0.	0.	216.	0.	0.	480.	0.	0.	0.
1965	986.	0.	16.	0.	0.	243.	0.	6.	729.	0.	0.	0.
1966	1071.	0.	13.	0.	0.	230.	0.	4.	848.	0.	0.	0.
1967	857.	0.	-3.	0.	0.	217.	0.	11.	656.	0.	0.	0.
1968	902.	0.	-38.	0.	0.	236.	0.	6.	738.	0.	0.	0.
1969	710.	0.	-1.	0.	0.	214.	0.	3.	573.	0.	0.	0.
1970	762.	0.	-16.	0.	0.	178.	0.	1.	663.	0.	0.	0.
1971	575.	0.	9.	0.	0.	180.	0.	8.	430.	0.	0.	0.

* Percolation average over years 618.5505 mm/year



8.2 Oak trees

* * Project: Oak
 * * File content: formatted hydrological data
 * * File name: Result.bfo
 * * Model version: swap_3_0_3
 * * Generated at: 06-Jan-2004 10:53:08

* Yearly output on water balance in top 1 metre of profile:

* RAIN = Rainfall
 * IRRIG = Irrigation
 * EVICPR = Evaporation by interception of rainfall
 * EVICIR = Evaporation by interception of irrigation
 * SEVP = Soil Evaporation
 * PTRA = Plant transpiration
 * PCBT = percolation at bottom
 * RUNO = Run-off
 * STOR = Storage
 * DRA1 = Lateral drainage for level 1
 * DRA2 = Lateral drainage for level 2
 * DRA3 = Lateral drainage for level 3

* Year	RAIN	IRRI	STOR	EVICPR	EVICIR	SEVP	PTRA	RUNO	PRBT	DRA-1	DRA-2	DRA-3
1942	841.	0.	83.	143.	0.	157.	19.	3.	468.	0.	0.	0.
1943	672.	0.	-12.	145.	0.	145.	21.	0.	379.	0.	0.	0.
1944	915.	0.	-6.	170.	0.	168.	19.	0.	569.	0.	0.	0.
1945	782.	0.	9.	158.	0.	166.	18.	0.	452.	0.	0.	0.
1946	823.	0.	-22.	154.	0.	171.	38.	0.	500.	0.	0.	0.
1947	562.	0.	27.	122.	0.	131.	48.	1.	305.	0.	0.	0.
1948	617.	0.	-24.	168.	0.	146.	62.	0.	272.	0.	0.	0.
1949	772.	0.	9.	200.	0.	140.	71.	0.	352.	0.	0.	0.
1950	1060.	0.	-2.	265.	0.	170.	83.	0.	548.	0.	0.	0.
1951	961.	0.	14.	245.	0.	150.	78.	0.	480.	0.	0.	0.
1952	898.	0.	2.	227.	0.	134.	85.	7.	505.	0.	0.	0.
1953	589.	0.	-25.	173.	0.	138.	92.	0.	228.	0.	0.	0.
1954	881.	0.	20.	263.	0.	126.	75.	2.	403.	0.	0.	0.
1955	700.	0.	-2.	214.	0.	131.	84.	0.	317.	0.	0.	0.
1956	778.	0.	-18.	229.	0.	135.	74.	3.	394.	0.	0.	0.
1957	990.	0.	-8.	247.	0.	139.	90.	0.	523.	0.	0.	0.
1958	729.	0.	20.	247.	0.	128.	82.	6.	344.	0.	0.	0.
1959	608.	0.	16.	180.	0.	115.	114.	0.	202.	0.	0.	0.
1960	984.	0.	-15.	255.	0.	130.	87.	3.	551.	0.	0.	0.
1961	1010.	0.	9.	264.	0.	136.	86.	0.	516.	0.	0.	0.
1962	788.	0.	6.	226.	0.	125.	83.	1.	384.	0.	0.	0.
1963	730.	0.	-25.	204.	0.	140.	85.	15.	378.	0.	0.	0.
1964	713.	0.	24.	200.	0.	151.	103.	0.	249.	0.	0.	0.
1965	986.	0.	9.	317.	0.	144.	87.	0.	436.	0.	0.	0.
1966	1071.	0.	12.	315.	0.	140.	92.	5.	533.	0.	0.	0.
1967	857.	0.	-7.	293.	0.	126.	104.	11.	355.	0.	0.	0.
1968	902.	0.	-36.	270.	0.	143.	87.	6.	472.	0.	0.	0.
1969	710.	0.	5.	225.	0.	139.	99.	6.	315.	0.	0.	0.
1970	762.	0.	-13.	249.	0.	105.	106.	1.	378.	0.	0.	0.
1971	575.	0.	2.	208.	0.	120.	100.	8.	191.	0.	0.	0.

* Percolation average over years 399.9754 mm/year

