



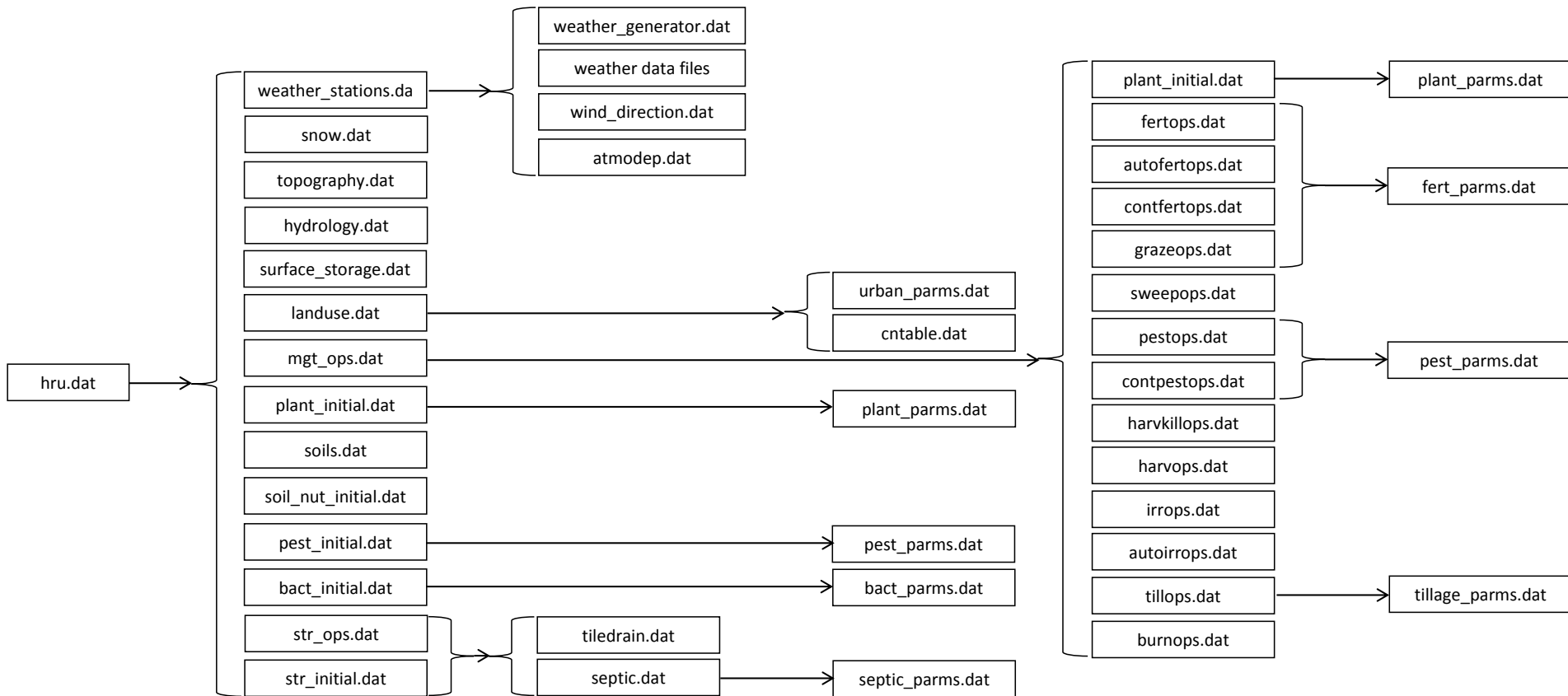
Introduction to the new modular SWAT code:  
The input file structure explained using the  
example of the Little River Experimental  
Watershed, USA

Katrin Bieger and Jeffrey G. Arnold  
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# Introduction

- Ongoing development of SWAT → integration of new variables and subroutines → complex code and input/output files, that are difficult to manipulate and maintain
- Large number of input files causes long model runtimes
- New modular SWAT code:
  - Data is stored in objects instead of a large number of individual arrays
  - HRUs, subbasins, aquifers and channels are separate spatial objects → flexibility in defining spatial interactions within the watershed

# Structure of HRU input files



# HRU properties

hru.dat: HRU properties - Little River Experimental Watershed

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NUMB	NAME	WEATHER	SNOW	TOPO	HYD	SURF_STOR	LANDUSE	MGT_OPS	PLANT_INIT	SOIL	SOIL_NUT	PEST_INIT	BACT_INIT	STR_OPS	STR_INIT
1	HRU1	1	1	1	1	0	2	2	2	7	7	0	0	0	0
2	HRU2	1	1	2	2	0	2	2	2	23	23	0	0	0	0
3	HRU3	1	1	3	3	0	3	3	3	7	7	0	0	0	0
4	HRU4	1	1	4	4	0	3	3	3	23	23	0	0	0	0
5	HRU5	1	1	5	5	0	1	1	1	1	1	0	0	0	0
6	HRU6	1	1	6	6	0	1	1	1	20	20	0	0	0	0
7	HRU7	1	1	7	7	0	1	1	1	23	23	0	0	0	0
8	HRU8	2	1	8	8	0	2	2	2	23	23	0	0	0	0
9	HRU9	2	1	9	9	0	3	3	3	23	23	0	0	0	0
10	HRU10	2	1	10	10	0	1	1	1	1	1	0	0	0	0
11	HRU11	2	1	11	11	0	1	1	1	11	11	0	0	0	0
12	HRU12	2	1	12	12	0	1	1	1	23	23	0	0	0	0
13	HRU13	2	1	13	13	0	5	5	5	25	25	0	0	0	0
14	HRU14	3	1	14	14	0	2	2	2	23	23	0	0	0	0
15	HRU15	3	1	15	15	0	3	3	3	23	23	0	0	0	0
16	HRU16	3	1	16	16	0	1	1	1	1	1	0	0	0	0
17	HRU17	3	1	17	17	0	1	1	1	9	9	0	0	0	0
18	HRU18	3	1	18	18	0	1	1	1	11	11	0	0	0	0
19	HRU19	3	1	19	19	0	1	1	1	23	23	0	0	0	0
20	HRU20	3	1	20	20	0	4	4	4	23	23	0	0	0	0

This file points to a number of separate files defining the HRU properties, e.g. climate, topography, hydrology, soil, land use and management

# Weather: climate stations and data

weather\_stations.dat: Weather station definition - Little River Experimental Watershed

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NUMB	NAME	LATITUDE	WGN	PCPSIM	TMPSIM	RHSIM	SLRSIM	WNDSIM	PGAGE	TGAGE	SGAGE	HGAGE	WGAGE	WNDIR
1	STA1	31.7	1	1	1	1	1	1	1	1	1	1	1	1
2	STA2	31.7	1	1	1	1	1	1	2	1	1	1	1	1
3	STA3	31.7	1	1	1	1	1	1	3	1	1	1	1	1
4	STA4	31.7	1	1	1	1	1	1	4	1	1	1	1	1
5	STA5	31.7	1	1	1	1	1	1	5	1	1	1	1	1
6	STA6	31.7	1	1	1	1	1	1						
7	STA7	31.7	1	1	1	1	1	1						
8	STA8	31.7	1	1	1	1	1	1						
9	STA9	31.7												
10	STA10	31.7												
11	STA11	31.7												
12	STA12	31.7												
13	STA13	31.7	1	1	1	1	1	1						
14	STA14	31.7	1	1	1	1	1	1						
15	STA15	31.7	1	1	1	1	1	1	15	1	1	1	1	1
16	STA16	31.6	1	1	1	1	1	1	16	1	1	1	1	1
17	STA17	31.6	1	1	1	1	1	1	17	1	1	1	1	1
18	STA18	31.6	1	1	1	1	1	1	18	1	1	1	1	1
19	STA19	31.6	1	1	1	1	1	1	19	1	1	1	1	1
20	STA20	31.6	1	1	1	1	1	1	20	1	1	1	1	1
21	STA21	31.5	1	1	1	1	1	1	21	1	1	1	1	1
22	STA22	31.5	1	1	1	1	1	1	22	1	1	1	1	1
23	STA23	31.5	1	1	1	1	1	1	23	1	1	1	1	1
24	STA24	31.5	1	1	1	1	1	1	24	1	1	1	1	1
25	STA25	31.5	1	1	1	1	1	1	25	1	1	1	1	1

Specifies whether observed or simulated climate data are used

Specifies which climate station is used by pointing to the number of the dataset in climate data files (pcp1.pcp, tmp1.tmp, hmd.hmd, slr.slr, wnd.wnd)

# Topography

topography.dat: Topographic characteristics - Little River Experimental Watershed

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NUMB	NAME	AREA	ELEV	SLOPE	SLOPE_LEN
1	HRU1	74.60	100.0	0.027189	91.463415
2	HRU2	2.44	100.0	0.032725	91.463415
3	HRU3	139.34	100.0	0.027189	91.463415
4	HRU4	40.21	100.0	0.032725	91.463415
5	HRU5	18.45	100.0	0.031270	91.463415
6	HRU6	1.26	100.0	0.031741	91.463415
7	HRU7	0.27	100.0	0.038190	91.463415
8	HRU8	1.21	100.0	0.027601	91.463415
9	HRU9	0.99	100.0	0.027601	91.463415
10	HRU10	16.32	100.0	0.024931	91.463415
11	HRU11	0.18	100.0	0.021020	91.463415
12	HRU12	17.04	100.0	0.038725	91.463415
13	HRU13	15.57	100.0	0.029592	91.463415
14	HRU14	1.17	100.0	0.034686	91.463415
15	HRU15	147.83	100.0	0.034686	91.463415
16	HRU16	4.31	100.0	0.033071	91.463415
17	HRU17	5.01	100.0	0.032694	91.463415
18	HRU18	98.9	100.0	0.027829	91.463415
19	HRU19	8.52	100.0	0.041238	91.463415
20	HRU20	60.12	100.0	0.032917	91.463415

# Hydrology

hydrology.dat: General hydrologic characteristics - Little River Experimental Watershed

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NUMB	NAME	LAT_TIME	LAT_SED	LAT_LEN	CANMX	ESCO	EPCO	ERORGN	ERORGP	EVPOT	DIS_STREAM	BIOMIX	DEP_IMP	LAT_ORGN	LAT_ORGP
1	HRU1	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
2	HRU2	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
3	HRU3	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
4	HRU4	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
5	HRU5	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
6	HRU6	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
7	HRU7	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
8	HRU8	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
9	HRU9	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
10	HRU10	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
11	HRU11	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
12	HRU12	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
13	HRU13	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
14	HRU14	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
15	HRU15	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
16	HRU16	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
17	HRU17	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
18	HRU18	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
19	HRU19	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0
20	HRU20	0.0	0.0	0.0	0.0	0.95	1.0	0.0	0.0	0.5	35.0	0.2	6000.0	0.0	0.0

# Soils

soils.dat: Soil parameters - Little River Experimental Watershed

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NUMB	SNAM	NLY	HYDGRP	ZMX	ANION_EXCL	CRK	TEXTURE	Z1	BD1	AWC1	K1	CBN1	CLAY1	SILT1	SAND1	ROCK1
1	Alapaha	3	D	1780.0	0.5	0.5	loamy	710.0	1.53	0.07	331.2	0.87	7.0	9.2	83.8	1.0
2	Albany	3	C	1650.0	0.5	0.5	loamy	1170.0	1.48	0.03	331.2	0.87	5.5	1.6	92.9	0.0
3	Ardilla	3	C	1830.0	0.5	0.5	fine-loamy	250.0	1.50	0.09	331.2	0.44	8.5	9.0	82.5	2.0
4	Carnegie	4	C	1650.0	0.5	0.5	fine	130.0	1.55	0.08	100.8	0.87	5.5	30.6	63.9	7.0
5	Clarendon	3	C	1650.0	0.5	0.5	fine-loamy	360.0	1.50	0.10	100.8	1.02	6.0	9.1	84.9	5.0
6	Cowarts	4	C	1650.0	0.5	0.5	fine-loamy	130.0	1.50	0.08	100.8	0.73	6.5	9.2	84.3	5.0
7	Dothan	3	B	1520.0	0.5	0.5	fine-loamy	360.0	1.45	0.08	100.8	0.15	10.0	4.3	85.7	3.0
8	Esto	3	B	1520.0	0.5	0.5	fine	150.0	1.55	0.13	100.8	0.44	14.0	19.2	66.8	5.0
9	Fuquay	3	B	1650.0	0.5	0.5	loamy	660.0	1.65	0.07	331.2	0.73	6.0	9.1	84.9	3.0
10	Grady	3	D	1650.0	0.5	0.5	fine	130.0	1.35	0.13	32.4	1.45	17.5	15.3	67.2	1.0
11	Kinston	3	D	1570.0	0.5	0.5	fine-loamy	150.0	1.50	0.16	100.8	2.03	11.5	26.0	62.5	1.0
12	Kershaw	1	A	2290.0	0.5	0.5	sandy	2290.0	1.48	0.04	507.6	0.44	3.0	6.4	90.6	1.0
13	Lakeland	2	A	2030.0	0.5	0.5	sandy	1170.0	1.50	0.07	331.2	0.44	5.0	1.4	93.6	3.0
14	Leefield	3	C	1650.0	0.5	0.5	loamy	790.0	1.53	0.06	331.2	0.87	7.5	9.0	83.5	2.0
15	Mascotte	5	D	1570.0	0.5	0.5	sandy	100.0	1.35	0.10	331.2	2.62	2.5	1.5	96.0	0.0
16	Ocilla	2	C	1650.0	0.5	0.5	loamy	810.0	1.55	0.07	280.8	0.87	7.0	9.2	83.8	2.0
17	Olustee	4	D	1650.0	0.5	0.5	sandy	230.0	1.25	0.08	331.2	2.33	4.5	1.4	94.1	0.0
18	Pelham	3	D	1680.0	0.5	0.5	loamy	840.0	1.60	0.07	331.2	0.87	7.5	9.0	83.5	2.0
19	Rains	2	D	1650.0	0.5	0.5	fine-loamy	280.0	1.55	0.09	331.2	2.03	6.0	6.7	87.3	2.0
20	Stilson	3	B	1650.0	0.5	0.5	loamy	690.0	1.48	0.08	331.2	0.44	5.5	9.2	85.3	2.0
21	Sunsweet	3	C	1650.0	0.5	0.5	clayey	100.0	1.43	0.11	100.8	0.44	10.0	23.4	66.6	8.0
22	Susquehanna	2	D	2030.0	0.5	0.5	fine	150.0	1.53	0.13	32.4	0.73	7.0	24.0	69.0	0.0
23	Tifton	4	B	1650.0	0.5	0.5	fine-loamy	250.0	1.43	0.06	331.2	0.44	5.5	9.2	85.3	7.0
24	TiftonU	4	B	1650.0	0.5	0.5	fine-loamy	250.0	1.43	0.06	331.2	0.44	5.5	9.2	85.3	7.0
25	Water	1	A	25.4	0.5	0.5	Water	25.4	1.00	0.70	600.0	0.01	0.0	0.0	0.0	0.0
26	AlapahaU	3	D	1780.0	0.5	0.5	loamy	710.0	1.53	0.07	331.2	0.87	7.0	9.2	83.8	1.0
27	Faceville	3	B	1680.0	0.5	0.5	fine	130.0	1.53	0.08	331.2	0.73	12.5	19.6	67.9	5.0
28	LeefieldU	3	C	1650.0	0.5	0.5	loamy	790.0	1.53	0.06	331.2	0.87	7.5	9.0	83.5	2.0
29	StilsonU	3	B	1650.0	0.5	0.5	loamy	690.0	1.48	0.08	331.2	0.44	5.5	9.2	85.3	2.0

Equivalent to former usersoil database!



# Landuse

landuse.dat: General land use properties - Little River Experimental Watershed

NUMB	NAME	CN_LU	USLE_P	IURBAN	URB_LU	OVN
1	FRST	46	1.00	0	0	0.60
2	AGRL	7	1.00	0	0	0.20
3	AGRR	7	1.00	0	0	0.20
4	PAST	36	1.00	0	0	0.35
5	WATR	1	1.00	0	0	0.20
6	URBN	47	1.00	1	4	0.25



urban\_params.dat: Urban parameters - General

NUMB	NAME	FIMP	FCIMP	CURBDEN	URBCOEF	DIRTMX	THALF	TNCONC	TPCONC	TNO3CONC	URBCN2	
1	URHD	0.600	0.440	0.240	0.180	225.000	0.750	550.000	223.000	7.200	98.0	Residential-High Density
2	URMD	0.380	0.300	0.240	0.180	225.000	0.750	550.000	223.000	7.200	98.0	Residential-Medium Density
3	URML	0.200	0.170	0.240	0.180	225.000	0.750	460.000	196.000	6.000	98.0	Residential-Med/Low Density
4	URLD	0.120	0.100	0.240	0.180	225.000	0.750	460.000	196.000	6.000	98.0	Residential-Low Density
5	UCOM	0.670	0.620	0.280	0.180	200.000	1.600	420.000	240.000	5.500	98.0	Commercial
6	UIDU	0.840	0.790	0.140	0.180	400.000	2.350	430.000	104.000	5.600	98.0	Industrial
7	UTRN	0.980	0.950	0.120	0.180	340.000	3.900	480.000	212.000	6.300	98.0	Transportation
8	UINS	0.510	0.470	0.120	0.180	340.000	3.900	480.000	212.000	6.300	98.0	Institutional
9	URBN	0.380	0.300	0.240	0.180	225.000	0.750	550.000	223.000	7.200	98.0	Residential

# Plant initialization and parameters

plant\_initial.dat: Plant community initialization - Little River Experimental Watershed

NUMB	NAME	PLANTS_COM	CPNM	DB_NUM	IGRO	PHU	LAI	BIOMS	PHUACC	POP	YRMAT	RSDIN
1	FRST	1	FRST	9	1	5340.3	0.00	0.00	0.00	0.00	0.00	10000.00
2	AGRL	1	AGRL	1	0	1826.0	0.00	0.00	0.00	0.00	0.00	1000.00
3	AGRR	1	AGRR	2	0	1826.0	0.00	0.00	0.00	0.00	0.00	1000.00
4	PAST	1	PAST	12	0	1996.0	0.00	0.00	0.00	0.00	0.00	3000.00
5	WATR	1	WATR	18	0	2256.5	0.00	0.00	0.00	0.00	0.00	0.00
6	UTRN	1	BERM	40	0	1996.0	0.00	0.00	0.00	0.00	0.00	3000.00

plant\_parms.dat: Plant parameters - General

NUMB	NAME	IDC	BIO_E	HVSTI	BLAI	FRGRW1	LAIMX1	FRGRW2	LAIMX2	DLAI	CHTMX	RDMX	T_OPT	T_BASE
1	AGRL	4	33.50	0.45	3.00	0.15	0.05	0.50	0.95	0.64	1.00	2.00	30.00	11.00
2	AGRR	4	39.00	0.50	3.00	0.15	0.05	0.50	0.95	0.70	2.50	2.00	25.00	8.00
3	AGRC	5	30.00	0.40	4.00	0.05	0.05	0.45	0.95	0.50	0.90	1.30	18.00	0.00
4	ORCD	7	15.00	0.10	4.00	0.10	0.15	0.50	0.75	0.99	3.50	2.00	20.00	7.00
5	HAY	6	35.00	0.90	4.00	0.05	0.05	0.49	0.95	0.99	0.50	2.00	25.00	12.00
6	FRST	7	15.00	0.76	5.00	0.05	0.05	0.40	0.95	0.99	6.00	3.50	30.00	10.00
7	FRSD	7	15.00	0.76	5.00	0.05	0.05	0.40	0.95	0.99	6.00	3.50	30.00	10.00
8	FRSE	7	15.00	0.76	5.00	0.15	0.70	0.25	0.99	0.99	10.00	3.50	30.00	0.00
9	WETL	6	47.00	0.90	6.00	0.10	0.20	0.20	0.95	0.70	2.50	2.20	25.00	12.00
10	WETF	7	15.00	0.76	5.00	0.05	0.05	0.40	0.95	0.99	6.00	3.50	30.00	10.00

# Management operations

mgtops.dat: Management schedules					harvkillops.dat: Harvest and kill operations - Little River Experimental Watershed						
OP	MON	DAY	HUSC	NUMB	NAME	HI_OVR	FRAC_HARVK				
1	FRST	1	0		1	Grain_Crop	0.0	0.5			
2	AGRL	2	4		2	Biomass_crop	0.8	0.5			
		2	0	0	0.150	1	0	0.0	PLANT	AGRL	
		11	0	0	0.160	1	0	0.0	AUTO_FERT		
		5	0	0	1.200	1	0	0.0	HARVKILL		
		20	0	0	0.000	0	0	0.0	SKIP_YEAR		
3	AGRR	3	4								
		2	0	0	0.150						
		11	0	0	0.160						
		5	0	0	1.200						
		20	0	0	0.000						
4	PAST	4	3								
fertifertops.dat: Auto-fertilization operations - Little River Experimental Watershed					fertifertops.dat: Auto-fertilization operations - Little River Experimental Watershed						
NUMB	NAME	DB_NUM	OPTION	AMT_KGH	SURFACE	STR_TRIG	PLT_TRIG	ANN_MX	EFF		
1	Autofert1	1	1	100.0	1.00	0.75	1	300.0	1.2		
1	Autofert2	5	1	100.0	1.00	0.75	1	300.0	1.2		
fertifparms.dat: Fertilizer parameters - General											
NUMB	FERTNM	FMINN	FMINP	FORGN	FORGP	FNH3N	BACTPDB	BACTLPDB	BACTKDDB		
1	Elem-N	1.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0	Elemental Nitrogen	
2	Elem-P	0.000	1.000	0.000	0.000	0.000	0.000	0.0	0.0	Elemental Phosphorous	
3	ANH-NH3	0.820	0.000	0.000	0.000	1.000	0.000	0.0	0.0	Anhydrous Ammonia	
4	UREA	0.460	0.000	0.000	0.000	1.000	0.000	0.0	0.0	Urea	
5	46-00-00	0.460	0.000	0.000	0.000	0.000	0.000	0.0	0.0	46-00-00	
6	33-00-00	0.330	0.000	0.000	0.000	0.000	0.000	0.0	0.0	33-00-00	
7	31-13-00	0.310	0.057	0.000	0.000	0.000	0.000	0.0	0.0	31-13-00	
8	30-80-00	0.300	0.352	0.000	0.000	0.000	0.000	0.0	0.0	30-80-00	
9	30-15-00	0.300	0.066	0.000	0.000	0.000	0.000	0.0	0.0	30-15-00	
10	28-10-10	0.280	0.044	0.000	0.000	0.000	0.000	0.0	0.0	28-10-10	

# Subbasin definition and elements

## sub\_define.dat:

sub\_define.dat: Subbasin definition file - Little River Experimental Watershed

```
106
NUMB  NAME  NUMBER
  1  SUB1   2      1      -7
  2  SUB2   2      8     -13
  3  SUB3   2     14     -22
  4  SUB4   2     23     -27
  5  SUB5   2     28     -36
```

## sub\_element.dat:

sub\_element.dat: Subbasin defining elements - Little River Experimental Watershed

```
1244
NUMB  NAME  OBTYP  OBTYPNO  HTYP  FRAC  DR
  1  HRU1   1      1      1  0.041394308  0
  2  HRU2   1      2      1  0.338490783  0
  3  HRU3   1      3      1  0.010348577  0
  4  HRU4   1      4      1  0.084622696  0
  5  HRU5   1      5      1  0.158457343  0
  6  HRU6   1      6      1  0.072706739  0
  7  HRU7   1      7      1  0.293979553  0
  8  HRU8   1      8      1  0.349181811  0
  9  HRU9   1      9      1  0.087295453  0
 10  HRU10  1     10      1  0.184840364  0
```

# Subbasin spatial connections and properties

sub\_connect.dat: Subbasin spatial connections - Little River Experimental Watershed

106

NUMB	NAME	PROPS	SRC_TOT	OBTYP	OUT	OBTYPNO	OUT	HTYP	OUT	FRAC	OUT	OBTYP	OUT	OBTYPNO	OUT	HTYP	OUT	FRAC	OUT
1	SUB1	1	2	6	1	1	1.0					5	2	2	1.0				
2	SUB2	2	2	6	2	1	1.0					5	2	2	1.0				
3	SUB3	3	2	6	3	1	1.0					5	3	2	1.0				
4	SUB4	4	2	6	4	1	1.0					5	4	2	1.0				
5	SUB5	5	2	6	5	1	1.0					5	5	2	1.0				
6	SUB6	6	2	6	6	1	1.0					5	6	2	1.0				
7	SUB7	7	2	6	7	1	1.0					5	7	2	1.0				
8	SUB8	8	2	6	8	1	1.0					5	8	2	1.0				
9	SUB9	9	2	6	9	1	1.0					5	9	2	1.0				
10	SUB10	10	2	6	10	1	1.0					5	10	2	1.0				

subbasin.dat: Subbasin properties - Little River Experimental Watershed

106

NUMB	NAME	DA_KM2	TAK	OVSL	OVS	OVN
1	SUB1	3.3766	1.0	50.0	0.05	1.0
2	SUB2	3.6483	1.0	50.0	0.05	1.0
3	SUB3	4.7320	1.0	50.0	0.05	1.0
4	SUB4	2.7712	1.0	50.0	0.05	1.0
5	SUB5	3.1832	1.0	50.0	0.05	1.0
6	SUB6	5.0026	1.0	50.0	0.05	1.0
7	SUB7	2.2902	1.0	50.0	0.05	1.0
8	SUB8	4.1254	1.0	50.0	0.05	1.0
9	SUB9	3.7186	1.0	50.0	0.05	1.0
10	SUB10	4.0341	1.0	50.0	0.05	1.0

the output is sent to

100% of total flow is sent to the channel in the respective subbasin

100% of recharge is sent to the aquifer in the respective subbasin

# Aquifer spatial connections and properties

aquifer\_connect.dat: Aquifer spatial connections - Little River Experimental Watershed  
106

NUMB	NAME	HA	AQU	PROPS2	SRC_TOT	OBTYP_OUT	OBTYPNO_OUT	HTYP_OUT	FRAC_OUT
1	AQU1	337.66	1	1	1	6	1	1	1
2	AQU2	364.83	2	1	1	6	2	1	1
3	AQU3	473.2	3	1	1	6	3	1	1
4	AQU4	277.15	4	1	1	6	4	1	1
5	AQU5	318.32	5	1	1	6	5	1	1
6	AQU6	500.26	6	1	1	6	6	1	1
7	AQU7	229.02	7	1	1	6	7	1	1
8	AQU8	412.54	8	1	1	6	8	1	1
9	AQU9	371.86	9	1	1	6	9	1	1
10	AQU10	403.41	10	1	1	6	10	1	1

aquifer.dat: Aquifer properties - Little River Experimental Watershed  
106

NUMB	NAME	FLO	STO	HGT	NO3	MINP	ORGN	ORFP	DELAY	ALPHA	REVAP	RCHG	SPYLD	HLFF_N	FLO_MIN	REVAP_MIN
1	AQU1	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1
2	AQU2	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1
3	AQU3	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1
4	AQU4	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1
5	AQU5	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1
6	AQU6	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1
7	AQU7	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1
8	AQU8	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1
9	AQU9	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1
10	AQU10	0.05	1000	0.02	0	60	0.1	0.1	3	0.03	100	0.03	0.02	30	0	0.1

Output is sent 100% of total flow is sent to the to one location channel in the respective subbasin

# Channel spatial connections and properties

channel\_connect.dat: Channel spatial connections - Little River Experimental Watershed

106

NUMB	NAME	AREA	CH	CHWQ	WST	SRC_TOT	OBTP_OUT	OBTPNO_OUT	HTYP_OUT	FRAC_OUT
1	CHA1	337.66	1	1	1	1	6	4	1	1.0
2	CHA2	364.83	2	1	2	1	6	6	1	1.0
3	CHA3	473.20	3	1	3	1	6	9	1	1.0
4	CHA4	614.81	4	1	3	1	6	9	1	1.0
5	CHA5	318.32	5	1	4	1	6	7	1	1.0
6	CHA6	865.09	6	1	5	1	6	10	1	1.0
7	CHA7	547.34	7	1	6	1	6	10	1	1.0
8	CHA8	412.54	8	1	7	1	6	13	1	1.0
9	CHA9	1459.87	9	1	8	1	6	11	1	1.0
10	CHA10	1815.84	10	1	9	1	6	14	1	1.0

channel.dat: Channel properties - Little River Experimental Watershed

106

NUMB	NAME	EQN	W	D	S	L	N	K	COV1	COV2	WDR	ALPHA_BNK	ICANAL	ONCO	OPCO
1	CHA1	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2
2	CHA2	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2
3	CHA3	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2
4	CHA4	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2
5	CHA5	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2
6	CHA6	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2
7	CHA7	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2
8	CHA8	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2
9	CHA9	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2
10	CHA10	0	20.0	4.0	0.004	1.5	0.05	1.0	0.5	0.5	4.5	0.1	0	5.0	0.2

Output is sent 100% of total flow is sent to the to one location channel located downstream.

# Basin

1. basin\_cc.dat: Basin control codes, e.g. PET method, water routing method, channel degradation code, stream water quality code
2. basin.dat: General watershed properties, e.g. EVLAI, FFCB, SURLAG, ADJ\_PKR



# Run the model and print output

## time.dat

```
time.dat: Simulation period and time step - Little River Experimental Watershed
NBYR   YRC   IDAF   IDAL   STEP
   3   2000     0     0     1
```

## print.dat

```
print.dat: Output print settings - Little River Experimental Watershed
NAME    NYSKIP  WB_HRU  NB_HRU  LS_HRU  PW_HRU  WB_SD  NB_SD  LS_SD  PW_SD  WB_SUB  NB_SUB
LREW          0      3      3      3      3      0      0      0      0      3      3

LS_SUB  PW_SUB  WB_BSN  NB_BSN  LS_BSN  PW_BSN  CHAN  AQU  RES  HYD  HYDCON  SOUT  MOUT
   3     3     3     3     3     3     1    1    0    0     0     0    1
```

1 = annual, 2 = monthly, 3 = daily

# Output files

- waterbal and waterbal\_aa
  - nutbal and nutbal\_aa
  - losses and losses\_aa
  - plantwx and plantwx\_aa
- } \*.hru, \*.sub, and \*.bsn
- channel.out and channel\_aa.out
  - aquifer.out and aquifer\_aa.out
  - mgt.out
  - crop\_yld\_aa.out
  - soils.out

# Conclusion

- Flexible spatial interactions within the watershed
- Sharing of data structures and files with other models (EPIC, APEX)
- Development of additional databases (e.g., management schedules and operations)
  
- Development of interface will start this fall
- Release of first version planned for next summer

Thank you for your attention!

[kbieger@brc.tamus.edu](mailto:kbieger@brc.tamus.edu)

+1 254 770 6567