d:\swatplus\_javaforge\Rev32\_docs

**REVISION 32 - April 17, 2017**

1. NEW\_INPUT\_FILES

Contains a list of new input files that are being tested.

1. NEW\_OUTPUT\_FILES

Contains a list of new output files being review.

1. Existing output files

List of changes in output files

1. Existing input files

List of changes in input files

1. Other

Other files that were modified in this revision.

1. **NEW INPUT FILES**

cons\_prac.lum

chem\_app.ops

topography.hyd

1. **NEW OUTPUT FILES**
2. **EXISTING OUTPUT FILES**

Extensions for all ASCII output files have been changed to **.TXT**

1. **EXISTING INPUT FILES**
2. ALL connect files

Removed ELEV column from the pertinent TOPO files and insert ELEV to proper connect file(s).

In the connect files, the order of the inputs should be: AREAKM2/LAT/LONG/ELEV

Insert zero for ELEV in SWAT-LTE datasets (as well as AQUIFER/RESERVOIR/CHANNEL) for now;

1. The SUBBASIN files are now named ROUTING UNIT files and the following names were changed in result:

!! routing unit

type input\_ru

character(len=25) :: ru\_def = "rout\_unit.def" **(previous name DEFINE.SUB)**

character(len=25) :: ru\_ele = "rout\_unit.ele" **(previous ELEMENT.SUB)**

character(len=25) :: ru = "rout\_unit.ru" **(previous name SUBBASIN.SUB)**

character(len=25) :: ru\_dr = "rout\_unit.dr" **(previous name SUBBASIN.DEL)**

end type input\_ru

type (input\_ru) :: in\_ru

1. ROUT\_UNIT.RU file (previously subbasin.sub) should be characters instead of integers for

ELEM\_DEF/ELEM\_DR/TOPO\_DB/FIELD\_DB

The same is true for RESERVOIR.RES

(INIT/HYD/RELEASE/SED/NUT/PST)

(**NOTE**: all example datasets don’t reflect this change; Chris\_George\_tx only ROUT\_UNIT.RU)

1. TOPOGRAPHY.SUB and TOPOGRAPHY.HRU are no longer read in the model; These files are now combined

file **TOPOGRAPHY.HYD**

Append TOPOGRAPHY.SUB to the end of TOPOGRAPHY.HRU;

Remove NUMB column from topography.sub and ELEV from both files;

TOPOGRAPHY.SUB and TOPOGRAPHY.HRU are deleted **(edit connect files in #1 before deleting topography.\* files);**

type input\_hydrology

character(len=25) :: hydrol\_hyd = "hydrology.hyd" **(same file)**

character(len=25) :: topogr\_hyd = "topography.hyd" **(topography.sub/topography.hru combined)**

character(len=25) :: field\_fld = "field.fld" **(same file)**

end type input\_hydrology

type (input\_hydrology) :: in\_hyd

EXAMPLE TOPOGRAPHY.HYD FILE:

topography.hyd

NAME SLP SLP\_LEN LAT\_LEN DIS\_STREAM DEP\_CO

top1 0.04 50 50 100 1

top2 0.006 50 50 100 1

top3 0.035 50 50 100 1

top4 0.035 50 50 100 1

top5 0.051 50 50 100 1

top6 0.043 50 50 100 1

top7 0.037 50 50 100 1

top8 0.014 50 50 100 1

top9 0.004 50 50 100 1

top10 0.039 50 50 100 1

top11 0.022 50 50 100 1

1. The following input files are no longer being used **OR** have been renamed:

STRUCTURAL: The following structural (.str) files have been removed.

contour.str

fire.str

plantparms.str

residue.str

stripcrop.str

terrace.str

initial.str

The following structural remain in the model:

tiledrain.str

septic.str

filterstrip.str

grassedww.str

bmpuser.str

type input\_structural

character(len=25) :: tiledrain\_str = "tiledrain.str"

character(len=25) :: septic\_str = "septic.str"

character(len=25) :: fstrip\_str = "filterstrip.str"

character(len=25) :: grassww\_str = "grassedww.str"

character(len=25) :: bmpuser\_str = "bmpuser.str"

end type input\_structural

type (input\_structural) :: in\_str

1. OPERATIONS: The following OPS files have been removed:

autofert.ops

autoirr.ops

contfert.ops

contpest.ops

fert.ops

pest.ops

The following OPS remain in the model:

harv.ops

graze.ops

irr.ops

chem\_app.ops (new file)

fire.ops

sweep.ops

type input\_ops

character(len=25) :: harv\_ops = "harv.ops" **(same file)**

character(len=25) :: graze\_ops = "graze.ops" **(same file)**

character(len=25) :: irr\_ops = "irr.ops" **(same file)**

character(len=25) :: chem\_ops = "chem\_app.ops" **(new file combined fert/pest applications)**

character(len=25) :: fire\_ops = "fire.ops" **(same file)**

character(len=25) :: sweep\_ops = "sweep.ops" **(same file)**

end type input\_ops

type (input\_ops) :: in\_ops

1. LANDUSE MANAGEMENT: (NOTE: SCHEDULE has been removed and combined in the LUM section):

Note: STRUCTURAL.SCH no longer being used;

CONS\_PRAC.LUM is a new file;

type input\_lum

character(len=25) :: landuse\_lum = "landuse.lum" **(same file)**

character(len=25) :: management\_sch = "management.sch" **(same file)**

character(len=25) :: cntable\_lum = "cntable.lum" **(same file)**

character(len=25) :: cons\_prac\_lum = "cons\_prac.lum" **(new file)**

end type input\_lum

type (input\_lum) :: in\_lum

1. Renaming of files in REGIONS:

ls\_catnunit.ele renamed to: ls\_unit.ele

ls\_catunit.def renamed to: ls\_unit.def

type input\_regions

character(len=25) :: ele\_lsu = "ls\_unit.ele" **(previously ls\_catunit.ele)**

character(len=25) :: def\_lsu = "ls\_unit.def" **(previously ls\_catunit.def)**

…

end type input\_regions

1. MANAGEMENT.SCH (a few changes were made to the management.sch file; an example is listed below to describe the file:

management.sch: Management schedules

MGT\_NAME NUMB\_OPS NUMB\_AUTO OP\_TYPE MON DAY HU\_SCH OP\_DATA1 OP\_DATA2 OP\_OVERRIDE

c-sb-af-at-ai 0 4 plant\_harv\_c-sb spring\_fert minimum\_till autoirr\_str.8

The above line of data is for auto operations where:

c-sb-af-at-ai - the name of the operations

0 = number of operation lines

4 = numb of auto operations to follow (below operations are referenced in the updated **d\_table.dtl** file):

plant\_harv\_c-sb

spring\_fert

minimum\_till

autoirr\_str.8

MGT\_NAME NUMB\_OPS NUMB\_AUTO OP\_TYPE MON DAY HU\_SCH OP\_DATA1 OP\_DATA2 OP\_OVERRIDE

mgt001 33 0

till 4 1 0.000 riprsubs null 0.000

till 4 15 0.000 riprsubs null 0.000

till 5 1 0.000 fldcult null 0.000

plnt 5 2 0.000 pnut null 0.000

harv 10 1 0.000 pnut peanuts 0.000

kill 10 1 0.000 pnut null 0.000

till 3 1 0.000 riprsubs null 0.000

till 3 15 0.000 riprsubs null 0.000

till 4 1 0.000 fldcult null 0.000

plnt 4 2 0.000 corn null 0.000

fert 4 3 0.000 elem-n broadcast 150.00

fert 4 3 0.000 elem-p broadcast 20.000

harv 9 1 0.000 corn grain 0.000

NUMB\_OPS = 33 operations to follow;

NUMB\_AUTO = no auto operations included;

OP\_TYPE OP\_DATA1 OP\_DATA2 OP\_OVERRIDE

till tillage.till --- ---

plnt plants.plt --- ---

harv plants.plt harv.ops ---

kill plants.plt --- ---

fert fertilizer.frt chem\_app.ops kg/ha

pest pesticide.pst chem\_app.ops kg/ha

irrm irr.ops --- amt mm

skip

NOTE: Updated D\_TABLE.DTL included in example data directory

1. FILE.CIO: This file has had some minor changes and additions/deletions due to the renaming of the files.

The changed sections are marked bold; unchanged sections are set NULL.

file.cio (control input/output) - 2 Stage Ditch input data

SIMULATION null null null null

CLIMATE null null null null null null null null

CONNECT null null null null null null null null null null null null null

CHANNEL null null null null null null null

RESERVOIR null null null null null null null

**ROUTING\_UNIT rout\_unit.def rout\_unit.ele rout\_unit.ru rout\_unit.dr**

HRU null null

DR null

AQUIFER null

HERD null null null

WATER\_RIGHTS null null null

LINK null null

BASIN null null

**HYDROLOGY hydrology.hyd topography.hyd field.fld**

EXCO null

BACTERIA null null

STRUCTURAL tiledrain.str septic.str filterstrip.str grassedww.str bmpuser.str

PARM\_DB plants.plt fertilizer.frt tillage.til pesticide.pst urban.urb septic.sep snow.sno atmo\_mon.dat

OPS harv.ops null irr.ops chem\_app.ops null null

**LUM landuse.lum management.sch cntable.lum cons\_prac.lum**

CHG null null null null null null null

INIT initial.pst initial.plt

SOILS soils.sol nutrients.sol

DECISION\_TABLE d\_table.dtl

CONSTITUENTS null null null null null

**REGIONS ls\_unit.ele ls\_unit.def** null null null null null null null null null null null null null null

1. **PRINT.PRT:**

More major changes have been made to the print.prt file as shown in the BOLD sections below. The ‘special’ files (csv/db/netcdf…) have been

moved to the top of the file. Day, mon, year, avann have been replaced with ‘y’ or ‘n’ for each object;

NOTE: The code for DB and NETCDF output files are not present in this revision.

print.prt: Output print settings

NYSKIP JD\_START JD\_END YR\_START YR\_END INTERVAL

0 1 366 1988 2012 1

AA\_NUMINT

3 1900 1940 1975

**CSV DB NETCDF**

**n n n**

**SOIL MGT HYDCON FDC**

**n n n n**

**OBJECTS DAILY MONTHLY YEARLY AVANN**

**basin\_wb n n y y**

**basin\_nb n n y y**

**basin\_ls n n y y**

**basin\_pw n n y y**

**basin\_aqu n n y y**

**basin\_res n n y y**

**basin\_cha n n y y**

**basin\_sd\_cha n n n n**

**basin\_psc n n n n**

**region\_wb n n n n**

**region\_nb n n n n**

**region\_ls n n n n**

**region\_pw n n n n**

**region\_aqu n n n n**

**region\_res n n n n**

**region\_cha n n n n**

**region\_sd\_cha n n n n**

**region\_psc n n n n**

**lsunit\_wb n y n y**

**lsunit\_nb n n n y**

**lsunit\_ls n n n y**

**lsunit\_pw n y n y**

**hru\_wb n y n y**

**hru\_nb n n n y**

**hru\_ls n n n y**

**hru\_pw n y n y**

**hru-lte\_wb n n n n**

**hru-lte\_nb n n n n**

**hru-lte\_ls n n n n**

**hru-lte\_pw n n n n**

**channel n n n y**

**channel\_sd n n n n**

**aquifer n n n y**

**reservoir n n n y**

**recall n n n n**

**hyd n n n n**

1. **OTHER**

The following new subroutines were added with this revision:

mgt\_chemapp\_read.f90

channel\_surf\_link.f90

basin\_sdchannel\_output.f90

cons\_prac\_read.f90

mgt\_fireops\_read.f90

basin\_sdchannel\_output.f90

lsu\_elements\_read.f90

lsreg\_output.f90

The following old subroutines were deleted with this revision:

mgt\_fertops\_read.f90

mgt\_autofertops\_read

mgt\_contfertops\_read

mgt\_pestops\_read

mgt\_contpestops\_read

scen\_terrace\_read

scen\_stripcrop\_read

scen\_plparmup\_read

scen\_contour\_read

scen\_rsdmgt\_read

str\_init\_read

scen\_fire\_read

update\_sched\_read

nut\_nminrl1

**RENAMING OF SWATDEG subroutines:**

sd\_hru\_module 🡪 hru\_lte\_module

sd\_hru\_control 🡪 hru\_lte\_control

sd\_hru\_read 🡪 hru\_lte\_read

sd\_hru\_output 🡪 hru\_lte\_output

**RENAMING OF sub routines:**

sub\_allo 🡪 ru\_allo

sub\_elements\_read 🡪 ru\_elements\_read

sub\_read 🡪 ru\_read

subbasin\_control 🡪 ru\_control

subbasin\_module 🡪 ru\_module

subbasin\_output🡪 lsu\_output

dr\_sub 🡪 dr\_ru