

Differences since REVISION 445 and REVISION 461

- 1) OUTPUT.HRU – added output variables to the daily, monthly, annual files:
 - CMUP_KGH – current soil carbon for first soil layer (kg/ha)
 - CMTOT_KGH – current soil carbon integrated – aggregating all soil layers (kg/ha)REFERENCE: ch32_output.doc

- 2) CHANVEL.OUT/WATRDEP.OUT – These output files existed in previous versions, but was taken out because of large files being written. It will only be written for a DAILY print code. A flag was added to file.cio to turn off/on BOTH files. Default is 0 (no file written). The CHANVEL.OUT file writes Day, Year, and daily streamflow velocities (m/s) for each channel in the subbasin. WATRDEP.OUT writes day, year, and average water depth (m). Jeff mentioned combining these files, but at this point it is still being written as two files.
REFERENCE: ch32_output.doc

- 3) CARBON – added inputs to the bottom of the .HRU file:
 - CF – this dimensionless parameter controls the response of decomposition to the combined effect of soil temperature and moisture. (Range 0.5 – 1.0)
 - CFH – will be determined whether users will be allowed to change this variable**
 - CFDEC – Undisturbed soil turnover rate under optimum soil water and temperature. Increasing this variable will increase carbon and organic N concentration. (Range 0.50 – 1.0)REFERENCE: ch19_input_hru.doc (chapter being updated now)

- 4) output.hru – HOPEFULLY, the changes for printing HRU's greater than 9999 is intact for daily, monthly, yearly and annually. This has not been tested to my satisfaction, but the code is there.

- 5) SNOWBAND.OUT – New output file that prints snow water content in elevation band on current day (mm/H₂O). A flag has been added to turn this file off/on named "ISNOW" read in from file.cio. Default for ISNOW is 0.
REFERENCE: ch32_output.doc

- 6) Added new input variable in .sub file for input snofile name. Line #35 of the .sub file currently reads "Climate Change". This is where we put the snow output file name, if applicable. (see attached 000180000.sub example file).
REFERENCE: ch05_input.sub.doc

- 7) OUTPUT.SOL – Mike Winchell made changes (see email 11/30/2010 – subject: Printing of output.sol
REFERENCE: ch32_output.doc

8) FILE.CIO – Took out the variable named “IPRS”. Changed to ‘titldum’. This input originally being read in right after “IPRP”. It was not being used anywhere in the code.

9)

10) HOURQ.OUT file – changes to this output file. This file will be written only if IPHR (file.cio) = 1:

Previous file: TOTAL SURFACE
WATER YLD RUNOFF
YEAR DAY HOUR SUB (m**3) (m**3)

New file: TOTAL
WATER YLD
YEAR DAY HOUR HYD (m**3)
REFERENCE: ch32_output.doc

11) output file **CSWAT_PROFILE.TXT** – Carbon output daily file (CSWAT in .bsn file should be = 1 for file to print)

IYR = current year of simulation

I = current day of simulation

J = HRU number

CMASS_PRO – Mass of soils carbon in the soil organic matter in the entire profile or sum of all layers (no residue; no manure) (kg/ha)

SOL_RSD_PRO – Sum for all layers of the soil residue (kg/ha)

SOL_MC_PRO – Sum for all the layers of the manure carbon (kg/ha)

REFERENCE: ch32_output.doc (Liz is working on adding) & cswat_profile.txt file

12) atom.atm file updated. Previous file MAY have been formatted wrong.

REFERENCE: atom.atm

REVISION 462

Added input variable to .chm file for phosphorus in the sub-soil changes:

PHOSKD_SUB - Look at revision 476 for further info on this variable.

REVISION 463

Changed units printed for CHOLA(mic/L), CBODU(mg/L) and DOXQ(mg/L) (output.sub - originally listed as kg/ha)

Irrigation source by each application code added to case(2 – irrigation operation) and case(10 – auto irrigation) in .mgt file.

New variable names: case (2) IRR_SC – Irrigation source code
IRR_NO – irrigation source location
case (10) IRR_SCA – auto irrigation source code
IRR_NOA – auto irrigation source location

REFERENCE: ch20_input_mgt.doc

REVISION 464

Auto calibration fix

REVISION 465

**TC_BNK and TC_BED input variables changed from character to real (*.rte file)
(It has been wrong all this time)**

REVISION 466

Another autocalibration fix

REVISION 467

Septic notes from Jaehak for Mike Winchell (interface)

1)*.sep – When the swat interface generates swat files in the txtinout folder:

ISEP_OPT(hru) – parameter should be 1 for septic HRUs

ISEP_OPT(hru) – parameter should be 0 for non-septic HRUs

2) Code change to fix daily outputs having “NaN” values

Sumv.f (line 591):

do ii=1,mstdo

if(wshddayo(ii).ne.wshddayo(ii)) wshddayo(ii) = 0 !! float error

3) there is a missing line in the septic code (readseptibz.f – line 36)

read (172,*,iostat=eof) bio_bd(ihru)

REFERENCE: send new mdb for septics

REVISION 468

Septic updates. Septic output variables added to output.std file

REVISION 469

**Input.std file to indicate septic HRUs (write statement in std2.f – writes a ‘x’ when
septic hru**

**Code added to accept relative humidity or dewpoint in daily hmd.hmd file (the
model will determine whether it is rel hum or dewpoint by the input)**

REVISION 470 (DO NOT USE THIS REVISION – GO TO REV 472)

Phosphorus code (for epa) added; includes 5 new input parameters in .hru file:

SED_CON – sediment conc in runoff after urban bmp is applied (0.0 – 5,000 ppm)

**ORGN_CON – organic nitrogen conc in runoff after urban bmp is applied (0.0 – 100
ppm)**

**ORGP_CON – organic phosphorus conc in runoff after urban bmp is applied (0.0 – 50.0
ppm)**

**SOLN_CON – Organic soluble nitrogen conc in runoff after urban bmp is applied (0.0 –
10.0 ppm)**

**SOLP_CON – Organic soluble phosphorus conc in runoff after urban bmp is applied (0.0
– 3.0 ppm)**

**REFERENCE: ch19_input_hru.doc (does not include information
on these variables; need to get from Jeff when he returns)**

New subroutine added (urb_bmp.f)

REVISION 471 (DO NOT USE THIS REVISION – GO TO REV 472)
WATOUT.DAT file – fixed all zeros being printed in file for stream temperature

REVISION 472 (ABOVE CHANGES IN REV 470-471 ARE INCLUDED IN THIS REVISION)

Deleted following statements in urb_bmp.f: surqno3(j) = 5.
latno3(j) = 2.
no3gw(j) = 3.

(Testing statements above removed in urb_bmp.f)

subbasin.f – put an if around the call to the new urb_bmp subroutine:

```
if (xx > 1.e-6) then
  call urb_bmp
end if
```

REVISION 473

A new variable added to PND file - line #25 (read in where TITLDUM originally was read in-between SPORGP and SPND1). Variable name: pnd_d50 (median particle diameter of sediment (micrometers – the model converts to mm).

REFERENCE: ch28_input_pnd.doc

REVISION 474

Phosphorus issues from Srin's Sacramento dataset resolved (virtual.f)

REVISION 475

Septic code additions. Two new input variables added to the bottom of .gw file (lines 15-16):

LAT_ORGN – Organic N in the base flow (mg/L) (Range 0.0 – 200.0 – Default = 0.0)

LAT_ORGP - Organic P in the base flow (mg/L) (Range 0.0 – 200.0 – Default = 0.0)

REFERENCE: ch24_input_gw.doc

REVISION 476

PPERCO_SUB - Phosphorus percolation coefficient (10 m³/Mg) by soil layer

These changes were made after Mike White reviewed the new phosphorus in the sub-soil changes that Jeff had made for Srin where a new input variable was added to the .chm file. Originally, Jeff named the new input variable "phoskd_sub". Mike looked at the code and said to avoid confusion the name should be "pperco_sub". This revision reflects the renaming of this variable in the codes:

```
allocate_parms.f
modparm.f
readchm.f
solp.f
zero1.f
```

Line #8 in .chm file (was a blank line)

REFERENCE: ch23_input_chm.doc

REVISION 477

CBODU and DOXQ written in output.sub changed to 'E' format

in: submon.f
subyr.f
subaa.f

REVISION 478

Added root to shoot ratio for Xuesong Zhang. This required two new inputs in the plant database file to be read after the current BMDIEOFF input.

RSR1 – initial root to shoot ratio at the beginning of the growing season (default = 0.40)

RSR2 – root to shoot ration at the end of the growing season (default = 0.20)

REVISION 479

In this version, we discovered that there were two RCN input variables in the .bsn file. Line #26 was renamed to "RCN_SUB_BSN" (same definition and default as previous RCN). Line #94 was changed to be a TITLE line.

REVISION 480

Problem in auto irrigation source code fixed.

REVISION 478

Added root to shoot ratio for Xuesong Zhang. This required two new inputs in the plant database file to be read after the current BMDIEOFF input.

RSR1 – initial root to shoot ratio at the beginning of the growing season (default = 0.40)

RSR2 – root to shoot ration at the end of the growing season (default = 0.20)

REVISION 479

In this version, we discovered that there were two RCN input variables in the .bsn file. Line #26 was renamed to "RCN_SUB_BSN" (same definition and default as previous RCN). Line #94 was changed to be a TITLE line.

REVISION 481

ET/PET ISSUES FIXED IN THIS REVISION.

changes were made as a result of an email from Mikolaj Piniewski dated 05/11/11 - subject swat2009 vs swat2005. Mikoklaj was comparing Revision 451 and Revision 477 and getting much different ET/PET values. The problem was in the reading of the relative humidity/dewpoint.

