The modification is in module rzDay.for, subroutine PHYSCL.

Line 28-267 were descriptions of variables in this subroutine.

Line 443-444 were commented out to avoid repeated calculation of drainage in infiltration periods.

Line 504 was commented out to make redistribution occur simultaneously with infiltration.

Code:

SUBROUTINE PHYSCL(CC,TMIN,TMAX,EPAN,RTS,U,ATMP,INP4,JDAY,PTRANS,

+ LAI,SLKS,TUP,COPLNT,CORES,FT,FTR,RDF,TTRFD,IMAGIC,NSC,AIRR,TQ,

+ IBRKTH,UPNIT,EWP,IRRTYP,MDAY,IPL,RH,IYYY,NOSTAR,XNU,ALPH,

+ H2OTAB,RPOOL,ICNVG,BIGCNV,HEIGHT,CAPZONE,BD,FPW,INXPL,EFFLUX,

+ IRTYPE,OMSEA,TLAI,SNOWPK,IRLOC,METMOD,IPR,SDEAD\_HEIGHT,

+ SDEAD,SDCN,HYDGRAD,ICHEM,jeday,tdew,npcpoint,nuse,

+ IHOURLY,ISHAW,IPENFLUX,hrt,hrts,hru,hrh,fracom,clouds,

+ RET\_day\_T,RET\_day\_S,iwzone,co2r,rth,hrth,wsi,plwidth,RSDIA,

+ smelt\_SHAW,TBOTM,Hmin,DAYRAIN,istress0,subirr,SSURFT,IPDEPTH,

+ jbday)

C

C======================================================================

C

C PURPOSE: SIMULATE PHYSICAL PROCESSES @ A SINGLE TIME STEP

C

C REF:

C

C VARIABLE DEFINITIONS:

C VARIABLE I/O DESCRIPTION

C -------- --- -----------

C ACCPO4 L

C ACTEVP L

C ACTTRN L

C AEF I FIELD SATURATION FRACTION [0..1]

C AEVAP L POTENTIAL SOIL EVAPORATION (CM/HR)

C AIRR I/O AMOUNT OF IRRIGATION WATER TO APPLY

C ASPECT I ASPECT ANGLE CLOCKWISE FROM NORTH [Radius]

C ATMP I ATMOSPHERIC PRESSURE CORRECTED FOR ELEV [KPA]

C ATRANS L ACTUAL TRANSPIRATION VALUE FOR EACH LAYER.[CM/DAY]

C BASE I BASAL AREA OF A PLANT [M^2]

C BKCHEM L FLUX OF SELECTED CHEMICALS AT BRK. THR. NODE

C CONTAINS NO3-N, PEST#1-3 [UG/CM^2]

C BRKH2O L FLUX OF WATER AT BRK. THR. NODE [CM/DAY]

C CANIRR L

C CC I TRANSPORT MATRIX FOR MOBILE CHEMICALS [MG/L]

C CONTAINS ONLY THE SOLUBLE FORM OF CHEMICAL:

C 1-HYDROGEN, 2-CALCIUM, 3-SODIUM, 4-MAGNISIUM,

C 5-CLORINE, 6-BICARBONATE, 7-SULFATE, 8-ALUMINUM,

C 9-NITRATE-N, 10-AMMONIUM-N, 11-CARBONATE,

C 12-UREA-N, 13-PEST #1, 14-PEST #2, 15-PEST #3

C CDNCI I WATER SEEPAGE OUT BOTTOM OF PROFILE [CM]

C CII L INFILTRATION AMT. AT CURRENT TIME STEP [CM]

C CLAT I LATERAL HYDROLIC CONDUCTIVITY [CM/HR]

C CMPS L CUMM. WATER SEEP OUT BOTTOM OF PROFILE FROM

C MACROPORES [CM]

C CNVG L

C CONCX2 I PEST. CONC. INVOLVED IN KINETIC PROCESSES [UG/G-S]

C COPLNT I INITIAL AMT OF PESTICIDE ON THE FOLIAGE [UG/CM^2]

C COR L CORRECTION FACTOR FOR ROUNDING ERROR

C CORES I INIT. AMT. CHEM. AVAIL. ON RESIDUE FOR DISSIPATION

C CSH I SOIL HEAT CAPACITIES (WET-DRY) [J/MM^3/C]

C CUMCLM I CUM CHEMICAL FLOW IN MP VS. TIME [UG/CM^2]

C CUMMF I CUM MACROPORE WATER FLOW [CM]

C CUTTER L

C DAYTIM L TIME OF DAY [0..24 HRS]

C DELOLD L

C DELSTO L

C DELT L INCREMENTAL TIME STEP [HR]

C DELTA L

C DELZ I NODAL DEPTH FORWARD DIFFERENCES [CM]

C DFLOW I WATER FLOW FROM DEADEND MACROPORES TO SOIL

C SPACIALLY DISTRUB [CM]

C DTCHEM L TOTAL AMOUNT OF CHEMICAL LOST TO SEEPAGE

C CORRESPONDS TO CC ORDER [UG/CM^2]

C DTEVAP L

C DTMASS L

C DTOLD L

C DTSEEP L

C DTSINK L

C DUR L STORM DURATION [HR]

C ELEV I LOCATION ELEVATION [M]

C EPAN I DAILY PAN EVAPORATION [CM]

C EVAP L AVE EVAP RATE OVER PHOTOPERIOD [CM/HR] (<=0)

C EWP I/O

C FERTIR I/O AMT. OF FERTILIZER IN IRRIGATION WATER [MG/L]

C FIRST L TRUE IF FIRST TIME THROUGH ROUTINE

C FLOW I CUMCUL. WATER FLOW FROM CONT. MACROPORES TO SOIL

C IN EACH LAYER. [CM]

C FMP L CUMMULATIVE FLOW FROM MACROPORES [CM]

C FT I

C FTR I

C H I NODAL SOIL WATER PRESSURE HEADS [CM]

C HKBAR I LAYER INTERFACE HYDRAULIC COND [CM/HR]

C HROOT L

C I L INDEX VARIABLE

C IBRKTH I

C ICRUST I/O FLAG FOR PRESENCE OF SURFACE CRUST [0=NO, 1=YES]

C ICHEM L INDICATOR FLAG SIGNALLING IF EQUILIBRIUM CHEMISTRY IS USED

C (0) - DO NOT USE CHEMISTRY MODEL, USE DEFAULT VALUES

C (1) - USE CHEMISTRY MODEL

C ID I/O INDEX FOR DEPTH OF WETTING FRONT

C IHOUR L

C IMAGIC I INDICATOR OF DEBUG OUTPUT

C INP4 I POINTER TO BRKPNT.DAT DATAFILE

C IP L INDEX FOR PESTICIDE NUMBER

C IPL I PLANT CURRENTLY MODELING [1..MXSPEC]

C IPSTM P

C IPSTO P

C IREBOT I BOTTOM B.C. INDICATOR: 1 (CONSTANT HEAD) OR 2 (UNIT FLUX

C ISEG L

C ITBL I FLAG FOR PRESENCE OF WATER TABLE [0=NO, 1=YES]

C ITYPE L INDICATOR FOR SOIL TYPE

C IYYY I --YEAR (4 DIGITS).

C J L INDEX VARIABLE

C JDAY I JULIAN DAY [1..366]

C JJ L

C JSTDAY L

C K I/O VON KARMAN CONSTANT ( =.41)

C LAI L LEAF AREA INDEX (LIVE LEAVES ONLY)

C TLAI L LEAF AREA INDEX (LIVE AND DEAD LEAVES)

C MAXBP P MAXIMUM NUMBER OF BREAK POINTS IN A RAINSTORM

C MAXHOR P MAXIMUM NUMBER OF SOIL HORIZONS

C MAXSCT P MAX NUMBER OF SOIL CONSTITUENTS PER HORIZON

C MDAY I TOTAL DAY FROM START OF SIMULATION

C MINUT L

C MXCHEM P MAXIMUM NUMBER OF CHEMICALS SIMULATED

C MXNOD P MAX NUMBER OF NUMERICAL NODES

C MXNODT P

C MXPEST P MAXIMUM NUMBER OF PESTICIDES

C NBPR L

C ND L

C NDXN2H I INDEX FOR NUMERICAL LAYERS TO HORIZONS,

C IE. WHICH HORIZON IS NUMERICAL LAYER IN.

C NHOR I NUMBER OF SOIL HORIZONS

C NN I NUMBER INTERIOR NODES IN RICHARD'S EQN SOLUTION

C NOSTAR I

C NS L

C NSC I CURRENT OUTPUT SCENARIO NUMBER

C NSPAN L

C OBTNIT L

C OLDSTR L

C PCLAY L SEDIMENT FRACTION CLAY CONTENT [0..1]

C PDEN L

C PES L POTENTIAL EVAP FROM SUBSTRATE [CM/DAY]

C PESTIR I/O AMT. OF PESTICIDES IN IRRIGATION WATER [MG/L]

C PET L POTENTIAL TRANSPIRATION [CM/DAY]

C PP L PHOTOPERIOD [HR]

C PSAND L SEDIMENT SIZE FRACTION SAND PORTION [0..1]

C PSILT L SEDIMENT SIZE FRACTION SILT PORTION [0..1]

C PTRANS I/O TOTAL POTENTIAL TRANSPIRATION (DIRECT + UNUSED

C SOIL EVAPORATION).[CM/DAY]

C PUP L

C PWRTS I NUMBER OF PLANT WITH ACTIVE ROOTS [#/HA]

C QF I LAYER INTERFACIAL MOIST FLUXES [CM/HR]

C QS L NODAL WATER UPTAKE BY PLANTS [CM/HR]

C RDF I FRACTIONAL DISTRIBUTION OF ROOTS BY LAYER [0..1]

C RFDD I/O TOTAL RAINFALL DEPTH [CM]

C RH I RELATIVE HUMIDITY [0..100]

C BD L SOIL BULK DENSITY [G/CM^3]

C RNDR L RANDOM ROUGHNESS [CM]

C ROI L TOTAL SURFACE RUNOFF [CM]

C RRATE I

C RTS I TOTAL S-W RADIATION INCOMING [MJ/M^2/DAY]

C SLKS I SOIL LAYER KD VALUES; CORRECTED FOR OM [CM^3/G]

C SLOPE I SLOPE OF FIELD [RAD]

C SMELT L SNOWMELT FOR THE DAY (CM)

C SNODON L FLAG FORCING ONE PASS THROUGH THE SNOMELT ROUTINE

C SNOWPK I/O PACK WATER EQUILIVALENT THAT IS PASSED IN FOR INITIAL

C SOILHP I MODIFIED BROOKS-COREY PARAMETERS

C (1): HB - BUBBLING PRESSURE O(H) [CM]

C (2): LAMDA - PORE SIZE DISTRIBUTION INDEX

C (3): EPS - EXPONENT FOR K(H) CURVE

C (4): KSAT - SAT HYDRAULIC CONDUCT [CM/HR]

C (5): WR - RESIDUAL WATER CONTENT

C (6): WS - SATURATION WATER CONTENT

C (7): WFC - FIELD CAPACITY (1/3 BAR) WC

C (8): WFC - FIELD CAPACITY (1/10 BAR) WC

C (9): WWP - WILTING POINT (15 BAR) WC

C (10): HB - BUBBLING PRESSURE K(H) CURVE [CM]

C (11): C2 - SECOND INTRCEPT ON K(H) CURVE

C (12): N1 - FIRST EXPONENT FOR K(H) CURVE

C (13): A1 - CONSTANT FOR O(H) CURVE

C SOILPP I

C SOLTP1 I/O ARRAY OF HEAT MODEL PARAMETERS,

C 1: SAT MOISTURE CONTENT [0..1]

C 2: FIELD CAPACITY [0..1]

C 3: TEXTURE CLASS (1-COARSE, 2-MED, 3-FINE)

C 4: # CONSTITUENTS FOR THERMAL PROPERTY CALC

C 5: DRY VOL HEAT CAPACITY [J/MM^3/C]

C SOLTP2 I (MAXSCT X MAXHOR X 3) ARRAY OF SOIL HORIZON

C CONSTITUENT PROPERTIES, CONSTIT'S BY ROW,

C HORIZON BY COL, PROPERTY BY PLANE

C 1: CONSTITUENT VOLUME FRACTIONS

C 2: CONSTITUENT HEAT CONDUCT [J/MM/HR/C],

C 3: PARTICLE SHAPE FACTORS GA

C SPAN L LOGICAL: T - STORM SPANS 2 OR MORE DAYS;

C SSEEP L

C START L FLAG FOR PHYSCL ROUTINE INITIALIZATION

C SSTART L FLAG FOR SNOW ROUTINE INITIALIZATION

C STMSEG L

C STORM L COL 1: INCREMENTAL BREAKPOINT TIMES

C ("DELTA T"'S) [HR]; INCREMENTAL BREAKPOINT

C RAINFALL DEPTHS [CM]

C T I SOIL TEMPERATURE IN NUMERICAL CONFIGURATION [C]

C TACTVE L

C TAIRR I/O NITROGEN IN IRRIGATION WATER

C TARAIN I/O NITROGEN IN RAIN WATER

C TBDH L

C TCII L

C TDAY L

C TDPLNT L

C TEVAP L

C TFMASS L

C THETA I VOLUMETRIC WATER CONTENT [CM^3/CM^3]

C TL I NUMERICAL LAYER THICKNESSES [CM]

C TLRO I/O LOSS OF NITROGEN DUE TO RUNOFF [KG-N/HA]

C TLSEP I/O LOSS OF NITROGEN DUE TO SEEPAGE [KG-N/HA]

C TLDRN I/O LOSS OF NITROGEN DUE TO TILE DRAINAGE [KG-N/HA]

C TLLAT I/O LOSS OF NITROGEN DUE TO LATERAL FLOW [KG-N/HA]

C TLT I DEPTH TO BOTTOM OF NUMERICAL LAYERS [CM]

C TM L AVERAGE DAILY AIR TEMPERATURE [C]

C TMASS L

C TMAX I MAXIMUM AIR TEMPERATURE [C]

C TMIN I MINIMUM AIR TEMPERATURE [C]

C TMIRR L

C TNITUP I/O TOTAL NITROGEN UPTAKE FOR WHOLE PROFILE [G/PLANT]

C TNUP L

C TOOTH L PROFILE WATER STORAGE BEFORE RAINFALL (CM)

C TPASS L

C TQ I/O

C TRFDD L ACCUMULATED TOTAL RAINFALL DEPTH [CM]

C TRNTIM L

C TROI L

C TRTS L TOTAL ROOTS FOR PROFILE (SUM OF RDF)

C TS0 L STORM STARTING CLOCK TIME [HR], 0<TS0<24

C TSE L STORM CLOCK ENDING TIME [HR], 0<TSE<24

C TSEEP L

C TSTART L

C TTCII L

C TTRFD L DAILY TOTAL RAINFALL DEPTH [CM]

C TTMASS L

C TTRO L

C TTUP L

C TUP I/O WATER UPTAKE / LAYER [CM].

C IRRTYP I --TYPE OF IRRIGATION, IE. SPRINKLER, FLOOD,

C FURROW, DRIP, or SUBSURFACE.

C U I IONIC STRENGTH [MOLES/L]

C UPNIT I/O UPTAKE OF NITROGEN FOR EACH LAYER [G/PLANT/LAYER]

C UPPASS L PASSIVE UPTAKE OF NITROGEN [KG-N/HA]

C UPACT L ACTIVE UPTAKE OF NITROGEN [KG-N/HA]

C UPTOT L TOTAL NITROGEN UPTAKE [KG-N/HA]

C UPDMD L TOTAL NITROGEN DEMAND BY PLANTS [KG-N/HA]

C WRES L MOISTURE CONTENT OF RESIDUE [0..1]

C WRKNUM I WORK ARRAY INTERMEDIATARY VALUES OF:

C 1: SUBDIAG ELEM'S IN TRIDIAG SYSTEM

C 2: DIAG "

C 3: SUPER "

C 4: R.H.S. "

C 5: WORKING SPACE FOR TRIDIAG SOL'N

C 6: "

C 7: TEMPORARY NEW TEMPERATURE SOL'N [C]

C 8: INTERFACIAL SOIL THERMAL COND [J/MM/HR/C]

C 9: SCALED PLAT WATER UPTAKES

C XLAT I LATITUDE OF FIELD

C XNU I

C ZN I DEPTH TO NUMERICAL NODES [CM]

C ZRFDD L

C

C COMMENTS:

C

C MASS STORAGE FILES:

C

C EXTERNAL REFERENCES:

C ADJDT

C CHSPAN

C EVNTRO

C HEATFX

C MANOUT

C MASSBL

C POTEVP

C RECON

C REDIST

C SGATE

C SINK

C SOILPR

C STMINP

C UPTAKE

C VGATE

C WCHEAD

C

C CALLED FROM:

C

C PROGRAMMER: KEN ROJAS

C

C VERSION: 3.0

C

C-----------------------------------------------------------------------

C

NOTE: Most of the codes were not provided here to simplify this documentation, readers are referred to the full “rzDay.for” document for details.

C . . . R A I N . . . AND . . . I R R I G A T I O N . . .

C ===========================================================

C .. CHECK FOR IRRIGATION EVENT OR SPANNING RAINFALL EVENT

IF(AIRR.GT.0.0D0.AND.(.NOT.SPAN)) THEN

C

C ..CHECK IF STORM AND IRRIGATION EVENT START AT THE SAME TIME

IF(AIRR.GT.0.0D0.AND.(JDAY.EQ.JSTDAY.AND.TS0.EQ.0.0D0)) THEN

C

C ..PAD THE STORM EVENT BY 1 MINUTE TO ALLOW BOTH TO OCCUR

TS0=TS0+1

ENDIF

SPAN=.FALSE.

PERIOD='IRR '

IF(SMELT.GT.0.0D0.or.smelt\_shaw.gt.0.0d0) THEN

IFMT='(1X,"===> SNOWMELT INFILTRATION AT ",I3,":", I2.2,1

+X,A2)'

ELSE

IFMT='(1X,"===> IRRIGATION EVENT AT ",I3,":",I2.2, 1X,A2)

+'

C

IF (IRLOC.GT.0) THEN

C .. IRLOC WOULD BE 0 IF AUTOMATIC IRRIGATION IS USED

IF(IRRTYP(IRLOC).EQ.1) THEN

C

C .. SPRINKLER IRRIGATION; SETUP PSEUDO-STORM DATA

ISEG=1

NBPR=4

NSPAN=4

C LIWANG MA, DEC 8, 2006. TO PREVENT RRATE BEING 0

IF (RRATE(IRLOC).EQ.0.0D0) RRATE(IRLOC)=1.0d0

RRATE\_C = RRATE(IRLOC)

C END OF MODIFICATION

TMIRR=AIRR/RRATE(IRLOC)

DO 140 I=1,NBPR

STMSEG(I,1,ISEG)=TMIRR\*0.25D0

STMSEG(I,2,ISEG)=AIRR\*0.25D0

140 CONTINUE

IF(TMIRR.GT.24.0D0) THEN

PRINT\*

PRINT\*,' <<< E R R O R >>>'

PRINT\*

PRINT\*,'IT WOULD TAKE MORE THAN 24 HOURS TO APPLY'

PRINT\*,'THE AMOUNT OF IRRIGATION WATER YOU SPECIFIED'

PRINT\*,'AT THE CURRENT APPLICATION RATE.'

PRINT\*

PRINT\*,'AMOUNT =',AIRR,' RATE =',RRATE(IRLOC)

CANIRR=.TRUE.

ENDIF

ELSEIF(IRRTYP(IRLOC).EQ.4) THEN

C

C ..FIND average Ksat of the top 30 cm Liwang Ma, 12-18-2008

TERM2=0.0D0

DO 402 J=1,30

JJ=IT2H(j)

c IF(Jj.EQ.1) THEN

TERM2=TERM2+1.0d0/soilhp(4,JJ) !1 cm increment for the infiltration grade.

c ELSE

c TERM2=TERM2+(DHB(J)-DHB(J-1))/soilhp(4,JJ)

c ENDIF

402 CONTINUE

SK\_avg = 30.0d0/term2/2 ! per Laj request to use 30 cm average Ksat/2.0

C .. DRIP IRRIGATION; SETUP FOR CONSTANT RAINFALL @ KSAT RATE

ISEG=1

NBPR=4

NSPAN=4

c TMIRR=AIRR/SOILHP(4,1)

TMIRR=AIRR/SK\_avg

DO 150 I=1,NBPR

STMSEG(I,1,ISEG)=TMIRR\*0.25D0

STMSEG(I,2,ISEG)=AIRR\*0.25D0

150 CONTINUE

C

ENDIF

ENDIF

ENDIF

ELSE

C

C ... INITIALIZE STORM

PERIOD='STORM'

IFMT='(1X,"===> RAINFALL EVENT AT ",I3,":",I2.2,1X,A2)'

C

C ... CHECK IF NEXT STORM SPANS NEXT DAY & ADJUST

IF(.NOT.SPAN) THEN

C

C ..ONLY GO IN HERE IF FIRST TIME THRU AFTER READ

NBPR=NBPRI

CALL CHSPAN(DUR,MAXBP,NBPR,SPAN,STORM,TS0,STMSEG,NS,ND)

ISEG=1

NSPAN=NS

DAYRAIN=DAYRAIN+RFDNEW

ELSE

C

C ..GO THRU HERE ONLY ON A SPAN STORM

IF(AIRR.GT.0.0D0) THEN

CALL MANOUT(-1,0,JDAY,0,IYYY)

PRINT\*,'===> IRRIGATION APPLICATION CANCELED (SPANNING)'

CANIRR=.TRUE.

ENDIF

PRINT\*,'===> CONTINUING PREVIOUS DAYS STORM'

PRINT\*

ISEG=2

SPAN=.FALSE.

NSPAN=ND

ENDIF

ENDIF

IF(CANIRR) THEN

AIRR=0.0D0

DO 160 I=1,4

FERTIR(I)=0.0D0

160 CONTINUE

DO 170 I=1,MXPEST

PESTIR(I)=0.0D0

170 CONTINUE

ENDIF

CANIRR=.FALSE.

C

C .. PRINT TIME OF STORM

IHOUR=INT(MOD(DAYTIM,12.0D0))

MINUT=INT((DAYTIM-INT(DAYTIM))\*60.0D0)

IF(IHOUR.EQ.0) IHOUR=12

IF(INT(DAYTIM/12.0D0).LT.1) THEN

WRITE(\*,FMT=IFMT) IHOUR,MINUT,'AM'

ELSE

WRITE(\*,FMT=IFMT) IHOUR,MINUT,'PM'

ENDIF

C

C ..FIND STORM DURATION

TMSTM=0.0D0

DO 180 I=1,NSPAN

TMSTM=TMSTM+STMSEG(I,1,ISEG)

180 CONTINUE

IF(AIRR.GT.0.0D0) THEN

TMSTM=0.0D0

TTAIRR=AIRR

ENDIF

C

C ... CALCULATE FLUX DUE TO SUBSURFACE DRAINAGE

SUBDR=0.0D0

!commented out to avoid repeated calculation

cx IF(IDRAIN.EQ.1) CALL TILEFLO(TLT,HORTHK,THGCUR,DRSPAC,DRRAD,

cx + H2OTAB,SUBDR,NN,NHOR,CLAT,IDP,UDRN)

C

C ..IF THERE IS A SNOWPACK SET TEMPERATURE SURFACE BOUNDRY CONDITION = 0

c if (ihourly.eq.1) then !use hourly air temperature for surface temp all the time, 6-12-2014

TMX=hrt(idaytim)

c else

c TMX=TM !check this if Penflux is used.

c endif

IF(SNP.GT.0.0D0) THEN !assume zero temperature only snow depth greater than an inch

TMX=TMX+(0.85D0+31.13D0\*SNP/100.0D0) !FROM GE AND GONG, 2010 VOL 115, D08107, DIO:10.1029/2009JD012798, J GEOPHYSICAL RESEARCH

ENDIF

C

C ..FIND POTENTIAL TOTAL OUTFLOW FOR STORM

C TOUTFLO = (SUBDR+BOTFLX)\*TMSTM

C

C ..FIND INITIAL WATER CONTENT

TOOTH=0.0D0

DO 190 I=1,NN

if (ishaw.eq.1) then

TOOTH=TOOTH+(THETA(I) + THETAI(I)\*RHOI/RHOL) \* TL(I)

else

TOOTH=TOOTH+THETA(I)\*TL(I)

endif

190 CONTINUE

C

c if (airr.gt.0.0d0.and.smelt\_SHAW.eq.airr) then

c STMSEG(1,1,1)=2.0D0 !make it a two hour rain event for snowmelt

c STMSEG(1,2,1)=AIRR

c endif

C .. GO THROUGH INFILTRATION ROUTINE

CALL EVNTRO(CC,NN,NHOR,ID,FTR,SLKS,STMSEG(1,1,ISEG),

+ STMSEG(1,2,ISEG),COPLNT,CORES,NBPR,ZRFDD,JDAY,CII,ROI,AIRR,

+ FMP,DTCHEM,T,SOLTP1,TMX,CMPS,IMAGIC,INT(TLT(IBRKTH)),BRKH2O,

+ BKCHEM,H2OTAB,SUBDR,DRSEEP,DTDCHEM,TLT,HORTHK,CAPZONE,SMELT,

+ IDP,OMSEA,IYYY,THGCUR,pori,SCUPCH,Hmin)

C

CUTTER=0.0D0

TMASS=0.0D0

DO 200 I=1,NN

TMASS=TMASS+CC(I,9)\*TL(I)\*THETA(I)

if (ishaw.eq.1) then

CUTTER=CUTTER+(THETA(I) + THETAI(I)\*RHOI/RHOL) \* TL(I)

else

CUTTER=CUTTER+THETA(I)\*TL(I)

endif

200 CONTINUE

TTMASS=TOOTH+ZRFDD-ROI-CUTTER-CDNCI-DRSEEP

IF((IMAGIC.LE.-1.AND.IMAGIC.GE.-3).OR.IMAGIC.EQ.-10) WRITE(9,

+ 1000) JDAY,TOOTH,ZRFDD,ROI,DRSEEP,CDNCI,CUTTER,TTMASS

C

C ..UPDATE HEADS WITH NEW WATER CONTENTS

CALL WCHEAD(THETA,H,SOILHP,NN,NDXN2H,MAXHOR)

C

C ..FIND WATER TABLE

IF(ITBL.EQ.1) CALL WATBL(NN,NDXN2H,MAXHOR,SOILHP,H,QF(NN),DELT,

+ TLT,ZN,IREBOT,BOTHED,BOTFLX,H2OTAB,ALPH,AEF,CAPZONE,THETA)

C

cx DAYTIM=DAYTIM+TMSTM !commented out to reset time step for redistribution

DELOLD=CUTTER

AIRR=0.0D0

FIRST5=.TRUE.

DTSEEP=DTSEEP+CDNCI

DTDSEEP=DTDSEEP+DRSEEP

TTRFD=TTRFD+ZRFDD+SNRO

TRFDD=TRFDD+ZRFDD+SNRO

TTRO=TTRO+ROI+SNRO

TROI=TROI+ROI+SNRO

RZrunoff=RZrunoff+ROI

TCII=TCII+CII

TTCII=TTCII+CII

IF(DAYTIM.GE.(24.0D0-COR)) THEN

DAYTIM=24.0D0

CALL MASSBL(MDAY,IMAGIC,TL,THETA,NN,DAYTIM,DTOLD,DTEVAP,

+ DTSINK,DTSEEP,DTDSEEP,DTLAT,TTRFD,TTRO,FMP,TTCII,DTCHEM,

+ CMPS,CNVG,DTDCHEM,DTLCHEM,ICNVG,BIGCNV,OMSEA,TTAIRR,SMELT,

+ SNRO,JDAY,IYYY,jeday,DTQSN,THETAI,ishaw,SCUPCH,dsubirr,

+ jbday)

ENDIF

CC ----- chd -------------

If (ErosionActive.and.nspan.gt.0) then !sab\

C GLEAMS

c RzIrrigation = AIRR\_C !sab presumed to be in cm for this day-used in Gleams

c RzRainfall = trfdd\_C !sab 5/03 - these link to gleams - in cm, must be in inches

c RzRunoff = troi\_C !sab conversion takes place in GLEAMSDailyErosion in Rz-Erosion

c gleams\_ei = 100 \* gleams\_exrain \* gleams\_ei

!DayMeanTemp = T(1) !sab

c Call DailyErosion (SOLOSS,ENRICH,iyyy\*1000+jday, !sab arg=yyyyddd=sdate

c & T(1),trfdd\_C, ! trfdd\_c includes rain and irrigation

c & RzRunoff)

totaltime=0.0d0

totalrain=0.0d0

thirtyRR=0.0d0

do i=1,30

RR30(i)=0.d0

enddo

c

do i=1,nspan-1

totaltime=totaltime+stmseg(i,1,iseg)

totalrain=totalrain+stmseg(i,2,iseg)

enddo

if (totaltime.le.0.5d0) then

thirtyRR=(totalrain/2.54d0)/max(totaltime,0.5d0)

else

istart=1

iend=0

do i=1,nspan-1 !nspan is # of breakpoints, nspan-1 is # of storm segments

iend=iend+int(stmseg(i,1,iseg)\*60.d0)

RRI=(stmseg(i,2,iseg)/2.54d0)/stmseg(i,1,iseg)

do j=istart,iend

thirtyRR=max(thirtyRR,AVEMOV(RR30,30,RRI,J))

enddo

istart=istart+int(stmseg(i,1,iseg)\*60.d0)

enddo

endif

end if

c

ELSE

C