

AnnAGNPS Pollutant Loading Model Program Updates

Version 3.32.a.03

(Dated 09/19/03)

Program changes:

- } Minor corrections to wording and bug fixes.

Version 3.32

(Dated 09/04/03)

Program changes:

- } Many enhancements have been added that are needed for the nutrient and gully, along with numerous bug fixes and output generation. The Management Schedule Data section was also improved to better account for rotations.

Version 3.30

(Dated 05/08/03)

Program changes:

- } Many enhancements have been added that are needed for the management data sections, along with numerous bug fixes and output generation.

Version 3.20

(Dated 10/17/02)

Program changes:

- } Many enhancements have been added that are needed for subsurface lateral flow, along with numerous bug fixes and output generation. Climate datasets can now be identified by AnnAGNPS cell.

Version 2.01c

(Dated 02/01/01)

Program changes:

- } Many enhancements have been added that are needed for the determination of the time of concentration, elimination of the cell profile data section, sediment yield from a cell, along with numerous bug fixes and output generation.

Version 1.10

(Dated 06/08/99)

Program changes:

- } Corrected bug in source-accounting

- } Corrected handling of pesticides from point sources
- } Corrected gully drainage area default
- } Added write to screen to inform user of program progress
- } Corrected error messages for Operations Reference checks
- } Reach sediment transport calculations modified.
- } EI lookup table added.
- } AnnAGNPS RUSLE code modified: including minor corrections and making the C, K and P factors dependent on cell elevation, allowing C, K and P to change with climate.
- } Add error checks in data checking routines.
- } Add determination of spatial variability of precipitation according to difference in altitude.
- } Solar radiation calculations changed
- } Non-unique variable names changed in RUSLE routines

Input changes:

- } Change default value of Reach Vegetation Code to 1.
- } Add option of user-entered EI Distribution values.

Version 1.08

(Dated 02/10/99)

Input changes:

- } Add variable for 2 Yr 24 Hr Precipitation to Read_Climate
- } Change allowable input for Precipitation Nitrogen to accept blank as input.
- } Change allowable inputs for Reach Nutrient Half-Life parameters to allow zero as an acceptable value.
- } Change default value of Reach Nutrient Half-Life parameters to 730.0
- } Change allowable inputs for Reach Geometry parameters to allow a greater range of values.

Program changes:

- } Change calculation of Tc and method of determining default hydraulic geometry coefficients and exponents
- } Change erosion routine so that soil loss in a cell is not calculated when

there is no runoff

Version 1.07

(Dated 11/10/98)

Input changes:

- } Accept blank for Reach Infiltration rate (Reach Data) as variable is currently not used.
- } USLE C-Factor (Landuse Reference Data) must be blank for AnnAGNPS mode. Only used in AGNPS mode.
- } "Mixed" Field Landuse identifier (Field Data) only applies in AGNPS mode.
- } Clarify that if Elevation Difference (1), Elevation Rain Factor (1), Elevation Difference (2), or Elevation Rain Factor (2) (Daily Climate Data) is blank, then all of these must be blank.
- } Rename Find Sand Ratio (Soil Data) as Very Fine Sand Ratio and change particle size definition.

Program changes:

- } Display output file names in AnnAGNPS window when model processing is done.
- } Use scour code flag check before adding any bed & bank sediment to reach. (Previously small amounts of bed & bank sediment could have appeared due to numerical accuracy in the reach sediment routing, when scour codes were not on)
- } Skip parameter initialization if any errors have been detected during reading input or data preparation. Job will not run if any errors are detected so initialization is unnecessary. (Eliminates system runtime for certain types of errors that were detected.)
- } Convert reach geometry identifiers and source accounting identifiers to uppercase when making identifier comparisons using either of these variables.
- } Accept blanks for Reach Infiltration Rate (Reach Data) and Residue Adjust (Crop Data) as variables are currently not used.
- } USLE C-Factor (Landuse Reference data) must be blank for AnnAGNPS mode.
- } Change criteria to pesticide applications > 0 for saving reach accumulation pesticide data to be used in source accounting. Previous criteria failed when only reach components were specified for source accounting output.
- } Set internal water temperature variable to a constant 20 degrees C. Currently water temperature is only used in nutrient and pesticide decay during reach routing.

Version 1.06

(Dated 9/28/98)

Input changes:

- } Change units for Annual Rainfall Height in Landuse Reference Data to feet or meters from inches or millimeters. Make consistent with Rainfall Height in Crop Data (Change listed for Version 1.02 - apparently not made at that time.)
- } Expand use of Reach Outlet Specification to identify additional Source Accounting File "base locations"
- } Qualify interaction (acceptable/unacceptable combinations) of Irrigation Application variables
- } Allow blank and zero as acceptable entries for Number Pesticide Applications (Operations Data)

Output changes:

- } Revise Source accounting output file to reflect the addition of "base locations" other than watershed outlet.

Program changes:

- } Correct array subscript for source accounting pesticide accumulation (Eliminate run time error M6101:MATH - floating-point error: invalid).

- } Use Reach Event file reaches as additional “base locations” for source accounting information written to source accounting file. The addition will provides reference locations for source accounting ratios at intermediate points in the watershed (along with the watershed outlet.)
- } Correct velocity equation used in determining reach travel time (Changes all reach travel times)
- } Reformat and label verification output during simulation period.
- } Add additional checks for interaction among Irrigation Application input variables.
- } Set small percolation rates to zero for pesticide computations (Eliminate underflow error)
- } Set small time step hydraulic conductivity values to zero for soil moisture computations (Eliminate underflow error)
- } Initialize average free freeze period for growing season (effects RUSLE K-factor to vary over growing season)
- } Initialize available soil moisture for automatic irrigation determination (effects amount of automatic irrigation applied)
- } Eliminate pesticide (out of) balance warning message when pesticide amount is so small it is set to zero.
- } Initialize cell humidity and ground solar radiation to values based on climate data (Both had been set to zero.).
- } Allow zero as acceptable entry for Number Pesticide Applications (Operations Data) (Previously, blank defaulted to zero but a zero entry was not acceptable)
- } Correct units conversion for Saturated Conductivity (Soils Data) (Affects all soil moisture calculations)
- } Correct parenthesis groupings in cloud attenuation equation used for ground solar radiation calculation.
- } Add drainage area size to sediment yield calculations from cells (Affects all sediment calculations)
- } Add check for runoff curve number of 100 and bypass division by zero (Eliminate floating point error)

Version 1.05

(Dated 6/15/98)

Input changes:

- } English and SI units added for K factor in Soil Data
- } Add Impoundment Verification Code to Verification Data

Program changes:

- } Correct units for cell runoff variable when in AGNPS mode (Requires re-running all AGNPS mode data sets).
- } USLE/RUSLE K factor changed from dimensionless to dimensioned units. Converted to SI as data is read in.
- } Impoundment process added.

Version 1.04

(Dated 5/15/98)

Input changes:

- } Revise Impoundment Data variables to coincide with impending impoundment code requirements.
- } Set minimum limit for all Manning's n variables to 0.005 (previously lower limits varied for the different inputs in Cell Data, Operations Data, Reach Data, and Simulation Period Data)
- } Revise variable range limits for power curve coefficients and/ or exponents (Gully Data, Impoundment Data and Reach Geometry Coefficients)

Output changes:

- } Expand cell event file (used as input to CONCEPTS portion of AGNPS 98) to include other non-reach components (gullies, feedlots and point sources).

Program changes:

- } Bypass time of concentration calculations for WATER cells.
- } Correct pesticide array subscripts (pesticide output may have had wrong pesticide name in previous versions)

- } Correct initialization of Cropland/non-cropland pesticides entered with Simulation Period Data (previous versions were not picking these up)
- } Revise units conversion for pesticide data transferred to Gully processing (impacts all gully pesticides)
- } Add units conversion factor for upstream peak flow (Event File) when English units were requested.
- } Implement input changes for Impoundment Data
- } Consistently revise lower limits for Manning's n in accord with input change.
- } Implement no screen output when Screen Output code is activated (Code was added to AnnAGNPS header record in version 1.03.)
- } Implement output changes for CONCEPTS file
- } Revise when non cropland nutrient parameters are set to precede any initialization years included before start of simulation period.
- } Cell nutrient computations revised for shallow (<200 mm) soil depths.
- } Pesticide computations revised to accommodate soils with impervious layer depth at surface
- } Revise small aggregate fall velocity value used in Reach Sediment.

Version 1.03

(Dated 3/26/98)

Input changes:

- } Clarification on Erosion Model Code in Simulation Period Data
- } Add optional input fields for future enhancements to AnnAGNPS header record

Output changes:

- } Add cell event file to be used as input to CONCEPTS portion of AGNPS 98 (The cell event file is still under development).

Program changes:

- } Correct check for complete year climate data when starting and ending climate dates are within a calendar year
- } Correct reach location that gully pesticides are added to.
- } Assign last complete month read in for a specific calendar month if average precipitation for that calendar month over climate record is zero. (Previously the average calendar month was undefined when average monthly precipitation was zero.)
- } Revise upper bound of cell runoff curve number (AMC III) to coincide with field capacity instead of saturation.
- } Add Error message for AGNPS mode with RUSLE erosion code selected and AnnAGNPS mode with USLE erosion code selected
- } Cutoff residue daily decomposition at small value(10.E-10) .(Eliminate system floating point underflow error
- Correct values output in Source Accounting file for sediment by size total ratios. (1st value was actually large aggregate followed by four zero values)
- } Add cell output file for use with CONCEPTS.

Version 1.02

(Dated 3/12/98)

Input changes:

- } Change units for Annual Rainfall Height in Landuse Reference Data to feet or meters from inches or millimeters. Make consistent with Rainfall Height in Crop Data
- } Add code for verifying Source Accounting Data to Verification Data header section
- } Revise code values for Annual Crop Code in Crop Data section
- } Delete statement that Field Manage Identifier could be blank if landuse was other than Cropland.

User Document changes:

- } Update the Error message Appendix

Program changes:

- } Add check (and error message) for RUSLE P- sub factors not entered (when RUSLE erosion code is 0) in Field Data section. (Conform to input specification)
- } Revise reading of Verification Data section such that only records with data entered are required. (Conform to input specification)
- } Correct decision making logic for pesticides when Pesticide Reference data and Pesticide Application data entered but no operation contains a Operation Pesticide Application Identifier. (Eliminate system run time error.)
- } Correct accumulation of sediment for source accounting (Sediment had been all zeros in output.)
- } Correct out of bank flow calculation in reach routing (Caused erroneous sediment quantities for out of bank flow conditions)
- } Correct RUSLE C-factor for multi-year rotation on non-cropland (Impact on cell sediment and subsequent sediment routing)

Version 1.01

Program changes:

- } Add error check for Field Manage Identifier entered with Field Data but no corresponding File Management Identifier in File Management Data found.(Eliminate version 1.00 run time system error.)
- } Correct internal data setup for situation where no Field Management Identifier is entered with Field Data for a non cropland field. (Eliminate version 1.00 run time system error.)
- } Correct internal setting of initial organic Carbon in cell soil layers (Eliminate Run Time 1000 error message.)
- } Revise source accounting output file to agree with formats identified for Outlet Accumulation Data and Source Accounting Output Ratio Table in Output Specifications
- } Use event and source accounting file names optionally entered as part of GLOBAL OUTPUT DATA: (Version 1.00 used only AnnAGNPS.evn and AnnAGNPS.evn or xxx.evn and xxx.src based on input file name (xxx.inp) contained in AnnAGNPS.fil file.)
- } Correct adding gully output to appropriate reach (Version 1.00 was not adding gully output if gully was not selected for source accounting output).

Version 1.00

First release of pollutant loading software. Software runs in two modes RUSLE based continuous simulation and USLE single event (using data converted from AGNPS5.0). Functions not operational in model include: winter routines and impoundments. No documentation of data contained in xxx.dbg file (which is generated from selections in Verification Data input). All documentation files are dated February 19, 1998. The 16-bit executable is not available at this time.