Releases

This page contains official release of the MESH code. "Interim releases" (e.g., beta versions) are available here.

The latest version of MESH is available here.

Most MESH versions are identified by a string of three numbers: "MESH major.minor.release"

- The major number is incremented when a significant change to the code or framework has occurred that breaks lineage with previous versions
- The minor number is incremented when a significant change to the code has occurred, and the results and outputs from the new release may significantly differ from the results and outputs from the previous version (provided the same configuration)
- The release number is incremented when a new version has been created to introduce new features and functionality, and/or when major bugs have been identified and corrected, that don't significantly impact the model results and outputs compared to the previous version

> ⓘ MESH versions 1.3.009 is the last release to use incremental release numbering. The release number for MESH versions 1.3.647 and later correspond to the revision number of that release in the code repository.

Page contents:

Latest Versions

Latest versions are the most recent releases of Standalone MESH. Using the top-listed most recent version is recommended for most users. If possible, users are recommended to upgrade their code. If starting a new project, users are recommended to use only the most recent version of the code.

For development purposes and certain applications, more recent versions of MESH are also available that contain experimental features.

MESH 1.4

MESH 1.4 is the current MESH series.

MESH 1.4.1398

> ⓘ MESH 1.4.1398 includes many bug-fixes and code optimizations, improved message and error handling, a significant update to OUTFIELDSFLAG and enhancements to many output files. It also continues to add more functionality to the new inline routing (RTE) and adds resume functionality to both RTE and SVS.

> ⚠ SIMSTATS (AUTOCALIBRATIONFLAG) and OUTFIELDSFLAG outputs are now created in the general output folder specified in MESH_input_run_options.ini.

> ⚠ MESH 1.4.1398 cannot be used to run in "point mode".

> ⚠ This version of MESH has new instructions for compilation.

> ⛔ In the migration of CLASS to version 3.6 in MESH 1.3.009, the `THFC` formulation based on Soulis (2009) was incorrectly assigned to the bottom-most layer in mineral soils, instead of to the deepest permeable layer in the soil column. This change was corrected in revision 1336 and impacts all releases of MESH 1.3 from version 1.3.009 and later, and all releases of MESH 1.4 until this version. MESH 1.4.1398 fixes this issue.
>
> There is no impact to previous versions that ran using setups where `SDEP` occurs inside or below the total depth of the column (`ZBOT(NSL)`), in which case the deepest permeable layer and the bottom-most layer are the same layer inside the soil column.

An update page for this release is here.

May 11, 2018 (also labelled "r1398")

- Known issues are here
- General updates are here
- Migration notes are here (from MESH 1.3 and earlier versions of MESH 1.4)
- The full revision history is here

MESH 1.4.1149

ⓘ MESH 1.4.1149 adds more functionality to the new inline routing option (RTE), adds a new baseflow option (WF_LZS), adds new optional parameter file formats (including support for fully-distributed gridded inputs), new option flags in MESH_parameters_hydrology.ini, and a "point mode" to run a land surface scheme in a single column to diagnose processes at the observatory scale, which is compatible with existing RUNC LASS benchmark files. The release also adds support for the "tb0" format for the streamflow and reservoir inputs files, and with the addition of MESH_input_reservoir.tb0, supports skipping records for controlled reservoirs (i.e., for streamflow insertion).

✓ MESH 1.4.1149 re-enables the Prairie Blowing Snow Model (PBSM)

An update page for this release is here.

September 22, 2017 (also labelled "r1149")

- General updates are described here
- Migration notes (from MESH 1.3) are here
- The full revision history is here

MESH 1.4.1064

ⓘ MESH 1.4.1064 introduces a new experimental option for inline routing (RTE). The scheme uses the same physics as in standalone WATROUTE (RPN_watroute), but is not completely implemented and does not include reservoir routing, streamflow insertion, resume functionality, temporally-driven parameterization, or diversions, and is disabled by default.

An update page for this release is here.

May 1, 2017 (also labelled "r1064")

- Known issues are here
- Migration notes (from MESH 1.3) are here
- The full revision history is here

MESH 1.4.1037

⚠ The spacing and formatting requirements for many of the input and output files are the same as required for MESH 1.4.1022. If migrating from MESH 1.4.1022, no changes are required. If migrating from earlier versions, like a version of MESH 1.3, review the migration notes and the critical bug fixes that were included with MESH 1.4.1022.

ⓘ The Prairie Blowing Snow Model (PBSM) remains disabled in MESH 1.4.1037 from concern that mismatched indices are used when exchanging data with CLASS and the driver, after converting the code to use tile-based indexing inside the model loop in MESH 1.3.733 and with the addition of the MPI exchange in MESH 1.4.1022.

An update page for this release is here.

February 31, 2017

- General updates are described here
- Updates required for existing setups (i.e., migrating MESH 1.3 input files) are described here
- The full revision history is here

MESH 1.4.1022

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ⓘ MESH 1.3.1022 fixes an issue where a fix made in MESH 1.3.003 caused the derived roughness coefficient for the floodplain to be `R1=2.0*WF_R2*WF_R2`, instead of `R1=2.0*WF_R2` as intended. Streamflow outputs and metrics based on them differ, especially around flooding and peak flow events, when MESH 1.3 parameter files are used with the MESH 1.4 series of code. The runoff generated by CLASS remains unchanged.

Hydrology coefficients calibrated to MESH 1.3 may not directly transfer to the MESH 1.4 series of code. A workaround is described here.

⚠ MESH 1.4.1022 fixes an issue where previously, the last time-step in the simulation day was incremented before calling WF_ROUTE. Dependent upon how much streamflow is generated within the last time-step of the simulation day, the streamflow outputs and metrics based upon them may differ when MESH 1.3 parameter files are used with the MESH 1.4 series code.

The runoff generated by CLASS remains unchanged.

ⓘ The spacing and formatting requirements of many input and output files have changed. Review the notes here.

ⓘ The Prairie Blowing Snow Model (PBSM) is disabled in MESH 1.4.1022 from concern that mismatched indices are used when exchanging data with CLASS and the driver, after converting the code to use tile-based indexing inside the model loop in MESH 1.3.733.

An update page for this release is here.

December 14, 2016

- General updates are described here
- Updates required for existing setups (i.e., migrating MESH 1.3 input files) are described here
- The full revision history is here

Legacy versions

Legacy versions are those versions of MESH released prior to the latest series of MESH versions. The latest series of MESH versions is the MESH 1.4 series.

MESH 1.3

MESH 1.3 was succeeded with the release of MESH 1.4 and is no longer supported.

MESH 1.3.733

ⓘ The modification to change the driver to use tile-based indexing may have caused mismatched indices when passing data to and from the Prairie Blowing Snow Model (PBSM). Using PBSM is not advised with MESH 1.3.733.

March 16, 2015

- Added the experimental 'alpharain' option to blend precipitation from two separate forcing files
- Added the BASINBALANCEOUTFLAG, MODELINFOOUTFLAG, STREAMFLOWOUTFLAG, and BASINSWEOUTFLAG control flags to optionally disable outputs to improve simulation run time
- Modified the driver to use tile-based indexing and removed the CLASSG and CLASSS routines from inside the model loop to improve simulation run time
- Changed the expected units of "drdn" from m m**-2 to km km**-2 when passed from the r2c text format drainage database file
- Updated the release to "1.3.1" and version to "driver_01-13-2015"

Gridded Outputs (OUTFIELDSFLAG)

- Added the "tsi" output option to produce outputs at specific grid locations (by `RANK`)
- Added support for the output of `TBAR` and `FRWS` at daily intervals
- Added support for the output of `GFLX`, `HFS`, `QEVP`, `THLQ`, and `THIC` at yearly, seasonal, monthly, and daily intervals

SIMSTATS (AUTOCALIBRATIONFLAG)

- Added the METRICSSPINUP control flag to modify the spin-up period to omit in the calculation of metrics when METRICSINCLUDESSPINUP is o ff (the default value is 30 days, as previously hard-coded)

MESH 1.3.686

December 23, 2014

General Updates

- Added the option to override the default names of common input and output files
- Added the option to read "demslope" and "drdn" from the drainage database to populate the `XSLP` and `DD` fields (automatically activated if present)
- Added the GGEOFLAG control flag to initialize `GGEO` from the MESH_ggeo.ini input file
- Removed the fixed-formatting requirement for reading values from the soil levels input file

Gridded Outputs (OUTFIELDSFLAG)

- Added support to create outputs of `STG` at the yearly, seasonal, and monthly intervals
- Added support to create outputs of `PREC`, `EVAP`, `ROF`, `DSTG`, and `LQWS` at daily intervals
- Added support to create outputs of `FSDOWN`, `FSVH`, `FSIH`, `FDL`, `UL`, `TA`, `QA`, `PRES`, `PRE`, `PREC`, `EVAP`, `ROF`, `LQWS`, `FRWS`, `RCAN`, `SNCAN`, `PDNW`, `SNO`, `WSNO`, and `STG` at the hourly interval
- Added support to create outputs of WR_RUNOFF and WR_RECHARGE at the hourly interval (for standalone WATROUTE)
- Added the "CUM", "AVG", "MAX", and "MIN" aggregation options for hourly outputs

SIMSTATS (AUTOCALIBRATIONFLAG)

- Added the METRICSINCLUDESPINUP control flag to consider a spin-up period of 30 days to omit in the calculation of metrics
- Added the drms.txt and abserr.txt output files containing root mean square error and absolute error
- Added the calculation of the Nash-Sutcliffe coefficient using the natural log of daily streamflow
- Added an extra column to the end of the NS.txt, drms.txt, and abserr.txt output files containing an average of the values when the domain includes more than one station location
- Added the Metrics_Out.txt output file with columns for `MAE`, `RMSE`, `BIAS`, `NSD`, `lnNSD`, and `TPD`

MESH 1.3.647

ⓘ MESH versions 1.3.647 and later use the underlying revision of the corresponding "tag" in the code repository as the release number.

⊘ MESH 1.3.647 includes a bug where the reservoir location in the East-West direction is not derived correctly if the LOCATIONFLAG control flag is on. This issue is fixed in MESH 1.4.1022.

⚠ Text format resume files from previous versions are not compatible with MESH 1.3.647.

November 13, 2014

General Updates

- Added the LOCATIONFLAG control flag for increased precision to identify streamflow gauge and reservoir outlet locations (to improve location handling at smaller resolutions)
- Added a new diagnostic output to the diagnostic output file to print the simulation run time
- Added the missing water balance component `WSNO` to the GRU_water_balance.csv output file
- Corrected the labeling of the `THLQ`, `THLIC`, and `THLGIC` column in the Basin_average_water_balance.csv output file when more or less than 6 soil layers are active
- Fixed the aggregation of GRU-provided forcing fields (e.g., CSV format) to use the GRU fraction as opposed to the land fraction read from the CLASS input file
- Fixed the aggregation of `PREACC` to consider the GRU-fractions within the grid
- Added the option to save and resume CLASS states to a seq format file using SAVERESUMEFLAG and RESUMEFLAG with option 3
- Added the PBSMFLAG control flag to activate the Prairie Blowing Snow Model (PBSM)
- Added new variables to the resume files, which breaks compatibility with resume files made by previous versions (text format only)

Climate Forcing Files

- Added support for the binary sequential (seq) file format
- Added the option to load multiple records of forcing data into memory (instead of reading at every time-step)

Gridded Outputs (OUTFIELDSFLAG)

- Added the OUTFIELDSFLAG control flag to activate and configure gridded outputs in r2c or seq format (configured with the outputs_balance.txt input file)
- Added support to create outputs of `PREC`, `EVAP`, `ROF`, `DSTG`, `TBAR`, `LQWS`, `FRWS`, `RCAN`, `SCAN`, `PNDW`, `SNO`, and `WSNO`
- Added support to write outputs at yearly, monthly, and seasonal intervals

CLASS

- Modified the calculation of `RADJ` and `DLON` to calculate latitudes and longitudes from the origin specified in the drainage database (replacing the use of `DEGLAT` and `DEGLON` from the CLASS input file)
- Fixed the calculation of `COSZ` to calculate a value for all grids instead of cascading `COSZ` of the first grid to all other grids in the domain

Standalone WATROUTE (RPN_watroute)

- Renamed PRINTRUNOFFFILEFLAG to PRINTRFFR2CFILEFLAG and PRINTLEAKAGEFILEFLAG to PRINTRCHR2CFILEFLAG for creating the runoff and recharge outputs for standalone WATROUTE, and changed the options to not create these files by default
- Updated RPN_watroute

SIMSTATS (AUTOCALIBRATIONFLAG)

- Disabled creating the MonteCarlo.txt, NS.txt, and NSW.txt output files by default (enabled with AUTOCALIBRATIONFLAG)
- Modified the structure of the MonteCarlo.txt, NS.txt, and NSW.txt output files replacing the single average value with separate columns for each station location

MESH 1.3.009 (revision 557)

ⓘ MESH 1.3.009 is the last release to use incremental release numbering.

⊘ In the migration of CLASS to version 3.6 in MESH 1.3.009, the `THFC` formulation based on Soulis (2009) was incorrectly assigned to the bottom-most layer in mineral soils, instead of to the deepest <u>permeable</u> layer in the soil column. This change was corrected in revision 1336 and impacts all releases of MESH 1.3 from version 1.3.009 and later, and all releases of MESH 1.4 until MESH 1.4.1398.

There is no impact to previous versions that ran using setups where `SDEP` occurs inside or below the total depth of the column (`ZBOT(NSL)`), in which case the deepest permeable layer and the bottom-most layer are the same layer inside the soil column.

⚠ Both text and r2c format resume files from previous versions are not compatible with MESH 1.3.009.

January 1, 2014

- Updated CLASS to version 3.6
- Added new variables to the resume files, which breaks compatibility with resume files made by previous versions (both text and r2c text formats)

MESH 1.3.008 (revision 548)

⚠ Text format resume files from previous versions are not compatible with MESH 1.3.008.

August 12, 2013

- Removed hard-coded limits for the maximum allowed number of streamflow gauge and reservoir outlet locations, which breaks compatibility with resume files made by previous versions (text format)
- Added the MonteCarlo.txt, NS.txt, and NSW.txt output files to provide metrics using the simulated daily average streamflow and daily observations read from the streamflow input file

MESH 1.3.007 (revision 533)

ⓘ This release accidentally removes the default options of the PRINTRUNOFFFILEFLAG and PRINTLEAKAGEFILEFLAG control flags such that the runoff and recharge outputs may always be created for use with standalone WATROUTE, dependent upon compiler options. To disable these outputs, the control flags must be listed and set to option 0 in the run options input file.

May 24, 2013

- Added PDMROF
- Removed the fixed-formatting requirement for reading values from the CLASS and hydrology input files
- Updated RPN_watroute

MESH 1.3.006 (revision 523)

August 15, 2012

- Re-activated the ability create runoff and recharge outputs for standalone WATROUTE controlled by the PRINTRUNOFFFILEFLAG and PRINTLEAKAGEFILEFLAG control flags (described here)
- Added an updated version of standalone WATROUTE to the distribution (RPN_watroute)

MESH 1.3.005 (revision 517)

June 13, 2012

- Added the SUBBASIN_INFO.TXT output file to print diagnostic information by SUBBASINFLAG
- Added gridded slope to the variables that can be read with r2c resume functionality (RESUMEFLAG with option 2)

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MESH 1.3.004 (revision 514)

⚠ Text format resume files from previous versions are not compatible with MESH 1.3.004.

May 10, 2012

- Changed a hard-coded limit for the maximum allowed number of streamflow gauge locations, which breaks compatibility with resume files made by previous versions (text format)
- Added the GRU_water_balance.csv output file for CLASS point outputs
- Changed the accumulation of PREACC to no longer consider the active fraction of grid cell
- Repurposed the SOILINIFLAG control flag to redistribute the components of SAND, CLAY, and ORGM (set SOILINIFLAG to option 5 to read the soil.ini input file as it did previously with option 1)
- Removed CLASSBHYD and moved the ability to use values read from the soil.ini input file into CLASSB (activated with SOILINIFLAG with option 5)
- Removed the wet and dry soil albedos from the soil.ini input file
- Added new variables to the resume files, which breaks compatibility with resume files made by previous versions (text format)
- Added the Basin_average_energy_balance.csv output file

MESH 1.3.003 (revision 489)

⊘ A bug-fix in revision 464 of setting WF_R1 = 2.0*WF_R2 in the WF_ROUTE routing code, based on literature, assumed that WF_R1 was the floodplain routing parameter itself, when it is actually a factor used in the flow equation to derive the parameter implicitly (this parameter implicitly appears as ((WF_R1 = 2.0)*WF_R2) in the equations themselves). With this revision, the derivation of the parameter becomes R1 = 2.0*WF_R2*WF_R2, instead of R1 = 2.0*WF_R2 as intended. This change impacts all releases of MESH 1.3 from version 1.3.003 and later.

In revision 978, the change was reverted by restoring WF_R1 = 2.0 (to again be used as a factor in the implicit derivation of R1). This correction is found in all releases of MESH 1.4 and later.

An effect of the correction is that WF_R2 values that were calibrated using MESH 1.3.003-1.3.733 may add unexpected flashiness during high flow events when used in simulations using MESH 1.4 and later. To emulate the behavior of MESH 1.3.003-1.3.733, WF_R1 must be manually derived (set equal to 2.0*WF_R2) and provided via input files to override the internally derived value.

Released for the MESH modelling workshop (September 8, 2011)

September 6, 2011

- Added experimental code for WATDRN3
- Added the MESH_output_streamflow_cumulative.csv output file for cumulative streamflow outputs
- Fixed the accumulation of TOTAL_THLQ, TOTAL_THIC, and TOTAL_THAL for the Basin_average_water_balance.csv output file
- Removed the ability to control which layers contribute to interflow using the IWF control flag; repurposed the IWF control flag to turn WATROF on or off (all permeable layers contribute to interflow)
- Relaxed the limit for snow water balance convergence from 1.0E-02 to 1.0E-01 in CLASSZ
- Relaxed the limit for snow energy balance convergence from 3.0 to 30.0 in CLASSZ
- Modified the derivation of R1 for WF_ROUTE by setting WF_R1 = 2.0*WF_R2 from WF_R1 = 2.0

MESH 1.3.002 (revision 462)

April 27, 2011

- Fixed bugs for FROZENSOILINFILFLAG and WF_ROUTE
- Added missing accumulations for TOTAL_THLQ, TOTAL_THIC, and TOTAL_ZPND for the Basin_average_water_balance.csv output file

MESH 1.3.001 (revision 453)

April 11, 2011

- Added the Basin_average_water_balance.csv output file

MESH 1.3.000 (revision 448)

⚠ Text format resume files from previous versions are not compatible with MESH 1.3.000.

March 18, 2011

- Changed the driver to determine the number of active soil layers from the number of lines read from the soil level input file (only values for three layers are still read from the CLASS input file, where the values of the third layer are applied to all deeper layers)

- Changed HOURLYFLAG to specify the length of record in minutes of records in the forcing files (the length of record must be uniform across forcing files; the default value is 30 for half-hourly records)
- Added code to check parameter limits against bounds specified in the minmax_parameters.txt input file
- Changed WF_ROUTE to use the first record from the streamflow input file to initialize channel storage at the beginning of a simulation (the first record before skipping records)
- Added SUBBASINFLAG to disable tiles that do not intersect streamflow gauge locations by setting their FRAC value to zero (skipped by CLASS)
- Fixed the derivation of grid dimensions for the UTM projection
- Renamed the configuration file to create r2c text format outputs "r2c_output.txt"
- Changed the variables written to the resume files, which breaks compatibility with resume files made by previous versions (text format)
- Added the option to save and read r2c text format resume files using SAVERESUMEFLAG and RESUMEFLAG with option 2
- Added the INTERPOLATIONFLAG control flag to temporally interpolate between forcing records (using linear interpolation)
- Added the FROZENSOILINFILFLAG control flag to activate the snowmelt infiltration into frozen soils parameterization
- Updated CLASS to version 3.5
- Updated WATROF and WATDRN (renamed from WATDRAIN)
- Disabled the ability to write runoff and recharge outputs for standalone WATROUTE
- Modified the code to save the daily average streamflow to file, where previously it saved an instantaneous value
- Added the AUTOCALIBRATIONFLAG control flag to activate the calculation of metrics using the simulated daily average streamflow and daily observations read from the streamflow input file
- Added the PREEMPTIONFLAG control flag to stop execution if the specified objective function is not improved compared to the value read from the pre_emption_value.txt input file
- Added messages to distinguish whether the simulation ended because it hit the end of the forcing files or because it reached the simulation stop date

MESH 1.2

MESH 1.2.02 (revision 133)

September 17, 2009 (also labelled "SA_MESH_1.3_unofficial")

- Updated WATROF and WATDRAIN (renamed from WAT_DRAIN) and added the calculation for BULK_FC (bulk field capacity) in WPREP
- Removed the old EnSim Hydrologic input/output modules (support for the r2c text format input and output files is preserved through separate code)
- Added the STREAMFLOWFLAG control flag to output streamflow at the model time-step
- Added the MESH_output_streamflow_all.csv output file
- Added a requirement for five WF_R2 values, regardless of how many river classes are active in the domain
- Renamed the drainage database in r2c text format "MESH_drainage_database.r2c"
- Renamed the drainage database in text format "MESH_drainage_database.txt"
- Renamed the runoff and recharge outputs for standalone WATROUTE "WR_runoff.r2c" and "WR_recharge.r2c"
- Changed the default number of soil layers from 3 to 6 (only values for three layers are still read from the CLASS input file, where the values of the third layer are applied to all deeper layers)
- Revised the CLASS point outputs to include columns for 6 layers
- Updated the release to "1.3.000" and version to "driver_04-20-2009"

MESH 1.2.01 (revision 35)

May 25, 2009

- Added the ability to read the first date of record from the streamflow input file (previously required to match the first date of record in the forcing files)
- Fixed skipping records in the forcing files and streamflow input file
- Removed the inline pre-processing options for specific compilers (Intel and GCC/gfortran)
- Removed the inline pre-processing options to selectively enable or disable parts of the code; the inline WF_ROUTE option is now included by default
- Updated the release to "1.2.000"

Archaic versions

Archaic versions of MESH are those released prior to the migration of the codes to the new repository in January, 2009. The full change history and the former "HAL-depot" support Web pages for these versions were retired at that time.

MESH 1.2

- Fixed bugs and improved representation for leap years for EnSim Hydrologic file formats in standalone WATROUTE
- Fixed incorrect types sets of variables between calls and subroutines
- Separated code for reading inputs from the driver into separate modules and subroutines
- Removed support for the WATFLOOD event input file (the r2c text format drainage database is required to be named "new_shd.r2c")
- Adopted standard commenting syntax throughout the driver and accessory codes
- Restored the inline WF_ROUTE routing option, related variables and hydrology, and support for the streamflow and reservoir input files
- Updated CLASS to version 3.4
- Added SAVERESUMEFLAG and RESUMEFLAG to save and resume model states from file (text format)
- Added the IWF control flag to control which layers contribute to interflow
- Added the SHDFILEFLAG control flag to specify the drainage database format to use
- Added the BASIN*FLAG control flags to specify the format of the forcing files

- Added the SOILINIFLAG control flag to control the use of the soil.ini input file for CLASSBHYD
- Updated the release to "2.0.000"

MESH 1.1

MESH 1.1.a01

- Removed internal variables formerly used by the inline routing (WF_ROUTE)
- Added the standalone soilInitialization program to the distribution (creates the soil.ini input file for CLASSBHYD)

MESH 1.1

Includes updates from development versions s-a_mesh_1.0.a01, s-a_mesh_1.0.b01, s-a_mesh_1.0.b02, s-a_mesh_1.0.b03, s-a_mesh_1.0.b04, s-a_mesh_1.0.b05, s-a_mesh_1.0.b06, s-a_mesh_1.0.c01, s-a_mesh_1.0.c02, s-a_mesh_1.0.c03, s-a_mesh_1.0.c04, s-a_mesh_1.0.c05, and s-a_mesh_1.0.c06.

- Removed hard-coded domain limits and replaced all internal driver variables with allocatable arrays
- Added more error traps and improved error messaging
- Added support for the WATFLOOD event input file and the r2c text format drainage database (activated automatically if present, the old format drainage database is read if not found)
- Added versioning to the hydrology input file to support different file structures
- Added support to write runoff and leakage files in r2c text format to run standalone WATROUTE and added standalone WATROUTE to the distribution (RTE)
- Disabled the inline routing and removed support for the streamflow and reservoir input files
- Added explicit Intel and GCC/gfortran compatibility for writing binary EnSim Hydrologic file formats
- Added printing the MESH release and version to screen (release "1.1.a01" and version "driver_04-20-2008")

Development Updates

s-a_mesh_1.0.c06 Updates

- Added HOURLYFLAG to switch between hourly (value 1) and half-hourly (value 0) forcing (hourly forcing is expected by default)
- Replaced hard-coded variables for CLASS options with control flags that can be set with the run options input file
- Added a general output folder and the ability to specify the simulation start and stop dates to the end of the run options files
- Added the ability to skip records in the forcing files if the simulation start date is after the first date of record
- Corrected typos in many diagnostic messages
- Added support to override the default forcing input format with CSV format files (automatically activated if present)
- Restored the basin_SCA_alldays.csv output file and added the basin_SWE_alldays.csv output file
- Added CLASSBHYD to assign soil properties from the soil.ini input file (automatically activated if present)
- Added the S_moisture.txt and T_temperature.txt input files to override values from the CLASS input file (automatically activated if present)
- Removed the fixed formatting requirement for reading GRU-dependent parameters values from the hydrology input file
- Added support for EnSim Hydrologic file formats (text and binary formats for outputs)
- Added support to properly increment leap years

s-a_mesh_1.0.c05 Updates

- Fixed the incorrect type sets of `WF_GRDN` and `WF_GRDE` in the driver and in WF_ROUTE

s-a_mesh_1.0.c04 Updates

- Fixed the incorrect type set of `JLAT` (diagnostic) in the driver

s-a_mesh_1.0.c03 Updates

- Aesthetic modification in WF_ROUTE

s-a_mesh_1.0.c02 Updates

- Added a check to stop flow if `THLIQ` is less than `THLRET` in GRDRAN

s-a_mesh_1.0.c01 Updates

- Reverted all changes in CLASSB from b02 and b04
- Reverted the activation of the `WFCI` parameter and removes added experimental changes to integrate WAT_DRAIN into GRDRAN from b06
- Added `WF_FRAC` to calculate `TOTAL_AREA` to derive aerially-averaged totals for the final water balance ("final tally")

s-a_mesh_1.0.b06 Updates

- Activated the `WFCI` parameter and added experimental changes to integrate WAT_DRAIN into GRDRAN

s-a_mesh_1.0.b05 Updates

- Added the derivation of `ASAT_FC` as a function of the available porosity in WATROF (not used)

s-a_mesh_1.0.b04 Updates

- Imposed a lower limit of `THLMIN` on the derived `THLRET` (repurposed as the wilting point for mineral soils) in CLASSB

s-a_mesh_1.0.b03 Updates

- Added the MESH_input_run_options.ini run options input file
- Moved the `WF_NUM_POINTS` (point outputs) from the hydrology to the run option input files
- Changed the structure of the hydrology input file to include section headers, option flags (unused), and GRU-independent parameter values (unused)
- Transposed the expected structure of the GRU-dependent parameter values in the hydrology input file
- Added the "TOTAL" accumulators to print the final water balance at the end of the simulation ("final tally")

s-a_mesh_1.0.b02 Updates

- Repurposed `THLRET` to store the wilting point for mineral soils (previously hard-coded to 0.04) in CLASSB
- Imposed an upper limit on `PSIWLT` of `PSI_LIMIT = 130.0` in CLASSB
- Updated `VCLAY` to be assigned using the `CLAY` values provided from the CLASS input file in CLASSB

s-a_mesh_1.0.b01 Updates

- Modified the driver to calculate `ZBOT` dynamically from `DELZ` and disabled reading the second column from the soil levels input file
- Removed the standalone D100.ini input file and moved reading `ZSNL`, `ZPLS`, and `ZPLG` values from the hydrology input file
- Added the diagnostic MESH_output_echo_print.txt output file
- Removed the basin_SCA.csv and basin_SCA_alldays.csv output files
- Fixed the missing initialization of `ITER/NITER` in TSOLVC

s-a_mesh_1.0.a01 Updates

- Modified CLASS to use the thermodynamic and momentum reference heights from the CLASS input file (previously hard-coded at 2.0 m and 10.0 m)
- Adopted new standard file names for all input files
- Added user-provided options for the 'd100' snow limit (previously hard-coded at 0.1 m) via the D100.ini input file
- Added the basin_SCA.csv and basin_SCA_alldays.csv output files
- Renamed the old format WATCLASS input file to become the hydrology input file

MESH 1.0

May 21, 2007

- Integrated WATROF (WAT_DRAIN) and WF_ROUTE into RUNCLASS (CLASS) version 3.3.1 (updated from version 2.7 in WATCLASS)