**WinSLAMM v 10.3.2 and v 10.3.3 Program Modifications - Final, 9/25/17**

**Interface, Data Input and Calculation Changes and Corrections**
1. Corrected file update error when loading WinSLAMM v 10.2 and earlier files.
2. Corrected file update error that occurred when opening earlier file versions with a wet detention pond.
3. Created a command line input option.
4. Corrected calculation errors for high traffic urban source areas, where if there was more than just one soil type, the program did not add the previous soil type area fraction to the current soil type area fraction.

**Wet Detention Ponds**
5. WinSLAMM now calculates the scour reduction ratio by time step, not event.  This allows users to calculate the performance of dry or extended detention ponds.
6. Corrected sediment elevation calculation error in v 10.3.2

**StormFilter**
7. Added and corrected bypass calculations.

**Biofilters**
8. Simplified residence time calculation to account for the time it takes water to flow through an engineered media plus the time the media is all or partly submerged.  Residence time calculations now do not vary by event; if no underdrain, the model uses the slowest of the media or native soil infiltration rate; otherwise the model uses the orifice flow rate calculated with the water surface at the top of the media.
9. Corrected problems with drawdown time calculation in input form because outflow device invert elevations were not set until after the calculation was performed.

**Grass Swales**
10. Corrected error in Mannings n calculation that occurred when very small values of the flow velocity times the hydraulic radius were applied to the Mannings n equation.

**WinSLAMM v 10.3.0 Program Modifications - Final, 4/3/17**

**Interface, Data Input and Calculation Changes and Corrections**
1. Correct error that occurs when loading files with unconnected junctions.
2. Updated .mdb File Batch Change option to include changing files to compacted soil types in addition to normal soil types and additional biofilter outlet options.

**Wet Detention Ponds**
3. Added a pump discharge option as either another outlet or as a discharge to a wastewater treatment plant.  Discharges to the WWTP are removed from the system.
4. Minor data entry grid problems and copy/paste problems corrected.
5. Modified the wet pond cumulative storage calculation to use the average area of each stage increment rather than the upper area of each stage increment.  This may have a minor effect on the pond performance calculation.

6. Added a calculator to simplify the creation of wet pond stage-area increments.

**Other Device**
7. Added a filterable pollutant reduction fraction option to the device.
8. Added all particulate and filterable pollutants to the calculation modification process used to remove the off-site drainage areas of a drainage basin.

**Hydrodynamic Device**
9. Corrected total area and drainage area calculations.
10. Removed the Particle Size Distribution file name requirement.

**Biofilters**
11. Removed the Particle Size Distribution file name requirement.
12. Prevented vertical standpipe from having a height less than 0.01 ft to prevent divide by zero errors.
13. Prevented the vertical standpipe discharge calculation variable c from going above 4.

**Pipes**
14. Added the Pipe drainage system option to convey runoff between junctions with or without a time shift.

**WinSLAMM v 10.2.1 Program Modifications - Final, 3/26/16**

**Interface, Data Input and Calculation Changes and Corrections**
1. Added rain numbers to the file execution interface to allow the user to track model run progress.
2. Allow the user to rename the project file set run output file.
3. Corrected Land Use Icon deletion problem.
4. Interface modifications that bold the control practice selected in the drainage system map and the corresponding practice in the control practice list.

**Filtering Control Practices**
5. Added the Hydro International Upflo filter as a source area and drainage system control practice.
6. Added the Stormwater Management Stormfilter as a source area and drainage system control practice.

**Wet Detention Ponds**
7. Corrected scour calculation error.

**Street Cleaning**
8. Corrected street cleaning variables M and B initiation when the parameters affecting them were changed.

**Hydro Dynamic Devices**
9. Restricted sediment accumulation in the settling tank to the top of the tank, preventing a sediment accumulation overflow.

10. Added maximum water depth value for each model run to the Control Practice Summary Tab output.

**Grass Swales**
11. Forced grass swale Mannings n maximum value to equal 1.

**WinSLAMM v 10.2.0 Program Modifications - Final, 9/30/15**

**Interface, Data Input and Calculation Changes and Corrections**
1. Added the ability to import an image into the drainage system map area.
2. Added Land Use Type to land use output names for each land use tab in tabbed output.
3. Modified the Source Area Particle Size Distribution button on the Current File Data form to access and change all source area Particle Size Distribution files using the Particle Size Distribution file listed on the Current File Data form.
4. User-defined Land Use Label names are is now listed in input data printouts.
5. Applied the critical particle size calculation process to all appropriate control practices.
6. Corrected stormfilter database name error that occurred when opening a file. Error had no effect on calculations.
7. Changed the maximum allowable runoff for pervious areas due to soil compaction from the Rv row number for the pervious area soil type to Rv = 3, for paved parking areas, so that pervious areas with compacted soil would reflect the compaction.
8. Corrected procedure call error due to Mannings n function getting a zero V x R value.
9. Changed text references of void ratio to porosity.
10. User can now end execution during a model run when the program is processing control practices.

**Biofilters**
11. Biofilter stage-discharge curve corrections.
12. Added Biofilter overflow warning to alert user that biofilter overflowed and results may be inaccurate if the biofilters is too small.
13. Added residence time calculation to the Biofilter control practice for each event (in the detailed output file) and for the model run (in the Control Practice Summary Tab).
14. Corrected Biofilter sharp crested weir error where program was using the .dat file variable format for the biofilter end contraction variable. Changed the .dat file import format to match the v 10 format.
15. Added reset variable to Biofilters to prevent any further reduction in time step values when the time increment value gets too small, and increased minimum time step from 0.1875 minutes to 0.75 minutes.

**Porous Pavement**
16. Added Porous Pavement icon to drainage system.
17. Corrected two minor Porous Pavement problems that caused differences between two identical PP practices in the same file.
18. Corrected Porous Pavement errors that allowed the control practice summary output to be different than the main summary output for runoff volume under certain conditions.

19. To calculate the PP area in the aggregate bedding if the pavement to base area ratio is different than 1, changed gPP(PPNm).Area * 43560 * mVoidRatio(a) * Ratio  to  gPP(PPNm).Area * 43560 * mVoidRatio(a) / Ratio, to correctly calculate the area of the aggregate bedding.

## Wet Detention Ponds
20. Corrected subscript out of range error in Wet Detention Ponds when entering all 20 stage-area values.
21. Changed Wet Detention Pond stage increments to equal 100 times the maximum stage depth. Corrected Wet Detention Pond Other Outlet stage discharge error that prevented the other outlet stage discharge curve from calculating the discharge for the stage increment with 0 cfs and the next stage increment with the first discharge for the other outlet.
22. Added mass lost to natural seepage basin calculation.

## Streets, High Traffic Urban Areas and Freeways
23. Added street width calculation to input data printout.
24. Updated v 9.4 parameter file and street dirt value update code to import .dat files into v 10.2.
25. Corrected mapping error in Freeway Land Use from runoff coefficient parameter file to source areas 19-27.
26. Modified street cleaning detailed output #194, #195, #197, #198 and #199 to include project file name and path, to consistently save these parameter files in the project file directory.
27. Corrected the street cleaning problem that prevented user-defined street cleaning coefficients m and B from being applied in the calculations.
28. Fixed high traffic urban source area parameter data entry issue that brought up message box unnecessarily.  Added Source Area PSD file name to input file output listing, corrected divide by zero error when printing high traffic urban highway input data, removed unneeded text when printing input values, improved formatting when printing street width information, and corrected case range for high traffic urban streets.
29. Corrected error that prevented source area .cpz file updates done using button in Current File Data for Freeway land uses, source areas 1 to 14.
30. Added Grass Swales as High Traffic Urban source area control practice option.

## Other Control Practice
31. Added feature to reduce the non-control outfall load by the mass of sediment removed by Other Devices, when the other devices are used to remove the off-site drainage areas of a drainage basin.
32. Changed Other Device significant figures from 2 decimal point to 4 decimal points to correct the problem where the event by event volume numbers are calculated correctly, but the hydrographs are reduced by the fraction 0.01 rather than 0.01 x 0.001.

## Filter Strips
33. Changed the effective flow length test for Filter Strips from less than zero to less than or equal to zero to prevent calculation errors that occur when the effective filter strip length is exactly equal to zero.

## Grass Swales

34. To accurately track mass loss, changed grass swale particulate reduction calculation approach to weigh the TSS reduction calculation by the incremental effluent volume rather than the incremental infiltrated volume.
35. Corrected error that allowed grass swale effluent hydrograph to not account for all the flow leaving the swale system if the fraction of the area served by swales was less than 1.0.