RAMMS CHANGELOG

V 2.1.08 [2026-10-07]

GENERAL

- **Improvement: Preparing Simulation Data**: The progress bar introduced in the previous update significantly slowed down the creation of the simulation data file (.var). This change has been reverted. The .var file is now written in a single operation again, resulting in much faster preparation.

AVALANCHE

- **Bugfix: Batch-Mode**: Fixed a crash in Avalanche batch mode introduced in the previous update.

V 2.1.07 [2026-10-02]

GENERAL

- **Bugfix: Add Deposition to DEM**: Fixed a bug where the new DEM was rotated after the function "Add deposition to DEM" was used.

- **Bugfix: Max-Values Checkbox**: Fixed a bug where RAMMS crashed when the function "Save Max-Values only" was checked when starting a simulation.

- **Bugfix: Batch Simulations**: Fixed a bug where RAMMS crashed when starting batch simulations.

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- **Bugfix: GeoTIFF Tags**: Fixed a bug where RAMMS crashed with invalid GeoTIFF tags.

- **Bugfix/Improvement: Solver**: Implemented several solver bugfixes and improvements:
  - Fixed a GPU memory-indexing issue affecting mesh-edge data that could cause crashes in certain simulations.
  - Fixed a parallel-processing issue in boundary-outflow detection on both CPU and GPU.
  - Improved GPU initialization checks for available memory and device information.
  - Added automatic CPU fallback with a clear error message if the GPU cannot be queried safely.

DEBRISFLOW

- **Improvement: Slush Flow Section**: The manual contains a new section about modelling slush flows with RAMMS (based on Jaedicke and Sandersen (2021) and Kronholm (2021).

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V 2.1.06 [2026-09-19]

GENERAL

- **Breaking changes: NEW GUI**: Major UI overhaul, with new toolbar buttons.

- **Breaking changes: GPU acceleration (optional, NVIDIA)**: The calculation module can now run on a NVIDIA GPU instead of the CPU, automatically or on request. Detected and used automatically for larger simulations when a suitable GPU is present; smaller simulations still run on the CPU.

- **New Feature: Improved file path handling**: File paths containing spaces (e.g. from OneDrive or other cloud storage providers) and special/non-ASCII characters (e.g. accented letters or localized characters common in countries like Norway or France) are now fully supported. This resolves previous issues with file access and improves compatibility across different systems and locales.

- **New Feature: New Project Wizard**: Implemented new project wizard. Specify *Project name* and *Project home* in the upper part and select DEM file in the middle part. View DEM details or clip DEM in *DEM settings*.

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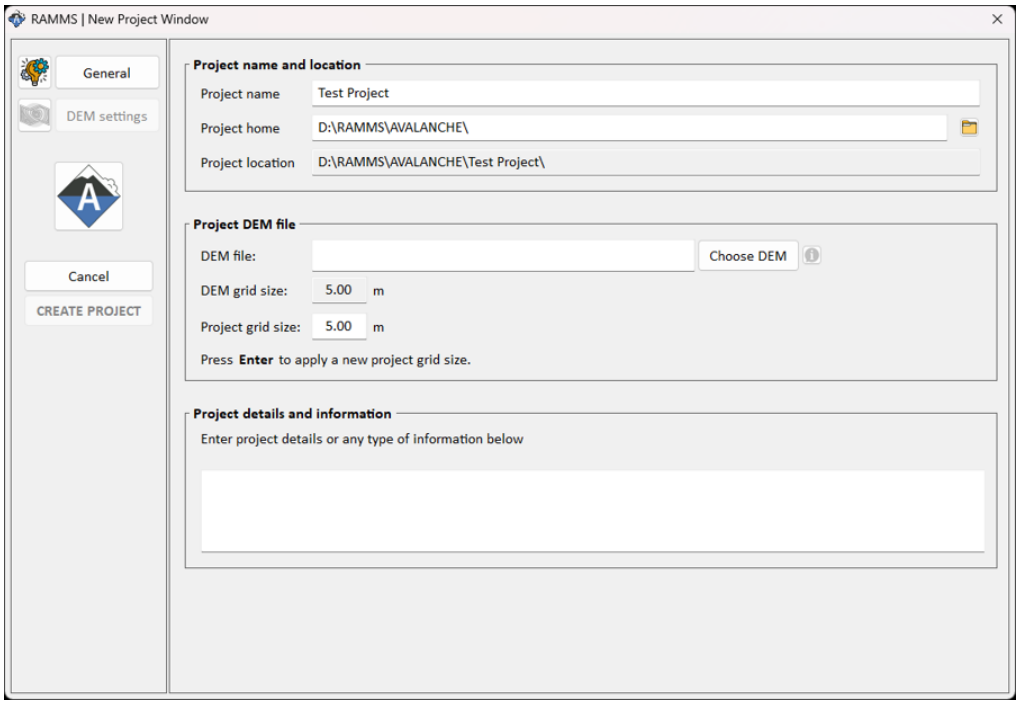
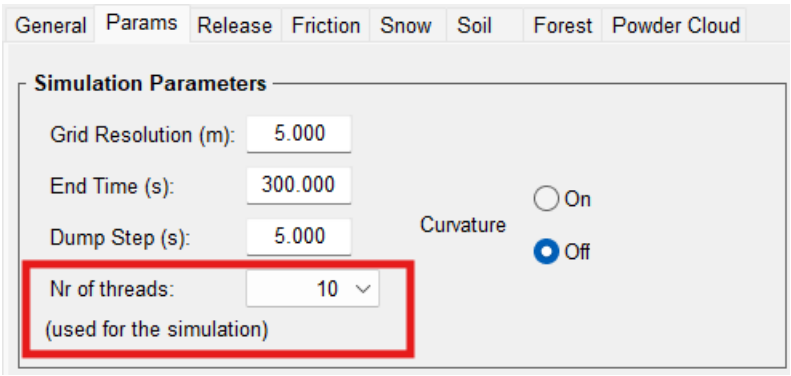


- **New feature: Nr of threads**: Users can now configure the number of threads their computer uses for the simulation. By default, the simulation utilizes **2/3 of the available threads** on the system.



- **New Feature: Adaptive colorbar styling**: The colorbar text and tick colors now automatically adapt to the background color: white on black backgrounds, and black otherwise. This improves visibility and readability across different visualization settings.

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- **New Feature**: **Improved 3D navigation usability** – Added a new navigation shortcut in the 3D view: hold **Shift** while dragging with the mouse to rotate the topography directly, without manually switching to the Rotate tool. This makes 3D navigation faster, smoother, and more intuitive.

- **New Feature**: **Impact load per unit width** – The impact pressure includes flow speed but does not distinguish between a very shallow and a very deep flows. RAMMS calculates a mean, distributed load by multiplying impact pressure by the flow depth. The resulting quantity has units of force per unit width (kN/m).

- **New Feature: Activity Log** – The Activity Log records the most important actions you take in RAMMS::Avalanche and RAMMS::Debrisflow so you can audit your work, retrace steps, and find files quickly. 'Track → Activity Log… → Show All Activity' shows all actions, or you can filter by action.

- **New Feature**: **Create TFW from GeoTiff** – RAMMS can now generate a .tfw world file directly from a georeferenced GeoTIFF, making it easier to use external map and image overlays without manual GIS preprocessing. Use *Extras → Create TFW from GeoTIFF (World File)*.

- **Improvement: Module Access**: Improved module access handling to make multi-user usage more robust and prevent modules from remaining blocked after crashes. Users can now automatically recover from previous sessions when restarting RAMMS.

- **Improvement: Improved the center-of-mass stopping criterion**: The calculation now weights each cell by its momentum rather than its flow height, so it tracks the actively moving mass specifically.

DEBRISFLOW

- **Improvement: Improved flow-discharge calculation for line profiles**: The exact profile length within each intersected grid cell is now used. Results remain unchanged for profiles aligned with the grid's X- or Y-axis, while discharge values

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for oblique or diagonal profiles are calculated more accurately and are independent of the profile drawing direction.

AVALANCHE

- **New Feature: PRA Release Tendency** - Potential Release Area (PRA) visualization using DEM-based terrain analysis and fuzzy-logic release suitability mapping. PRA classes represent relative release tendency/suitability, not avalanche probability.

- **Improvement: MuXi Visualization**: Improved MU/XI visualization performance in RAMMS::Avalanche. Friction map generation for display is now significantly faster, especially for larger calculation domains.

V 1.8.27 [2024-07-12]

- **Bugfix: Web Update**: In version 1.8.26 and earlier, the Web Update feature did not work, due to a missing option. Resolved. From version 1.8.27 on, Web Update should work again.

V 1.8.26 [2024-07-01]

GENERAL

- **Improvement: Bat-Files**: Up until now, when starting a simulation, RAMMS created a bat-file, and then started this bat-file. This could create problems because of Windows-access-privileges. Resolved! RAMMS does not use bat-files any more to start a simulation.

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- **Improvement**: **Export ASCII/TIFF files**: Also Max Momentum and Max Shear Stress (for DBF) are exported automatically after a simulation.
- **Improvement**: **Batch Mode**: Small bugs resolved in batch mode.

V 1.8.0 [2022-10-26]

GENERAL

- **New Feature**: **Parallelization**: With this new update, the computational core of RAMMS uses OpenMP parallelization (CPU). This is especially important for debris flow simulations, where the grid resolution is normally more accurate (in the order of 1-2m) than for avalanche simulations (5-10m). We also slightly improved the numerics, yielding improved results in channelized flow regions.

- **New Feature**: **Recent Files**: RAMMS stores up to 10 of your most recent input- or output-files, such that you can open and find them easier. You can find this feature in the menu ***"Track -> Recent…"***.

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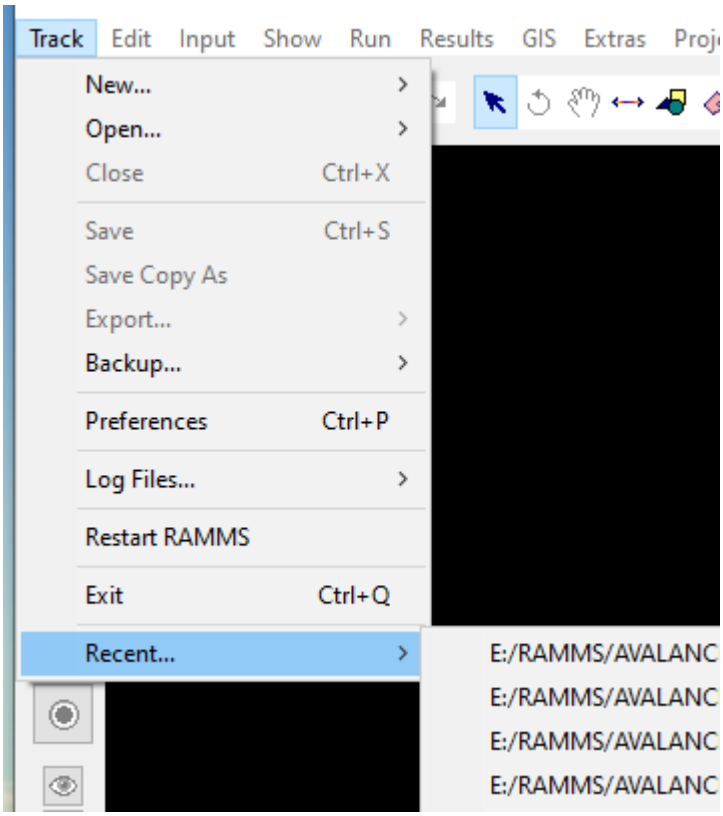

- **New Feature**: **Export results to TIFF-raster**: RAMMS could only export results to ASCII grid raster files (*GIS → Export… → Result as Raster Data*). **NEW:** the default export format is GEOTIFF! If you want to export ASCII raster files, then you can set the **OUTPUT_GRID_FORMAT** keyword in the Add. Preferences:

  OUTPUT_GRID_FORMAT ASCII (ASCII or GEOTIFF)

  Then click ***Save*** and ***OK***.

- **New Feature**: **Time Annotation in Main Window**: When animating, a text shows the elapsed time in seconds.

- **New Feature**: **DEM Contour Lines**: Contour lines of the DEM can be visualized (*GIS → Show Contour Plot*).

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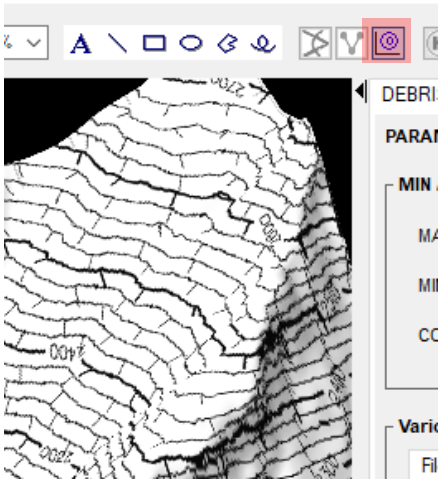
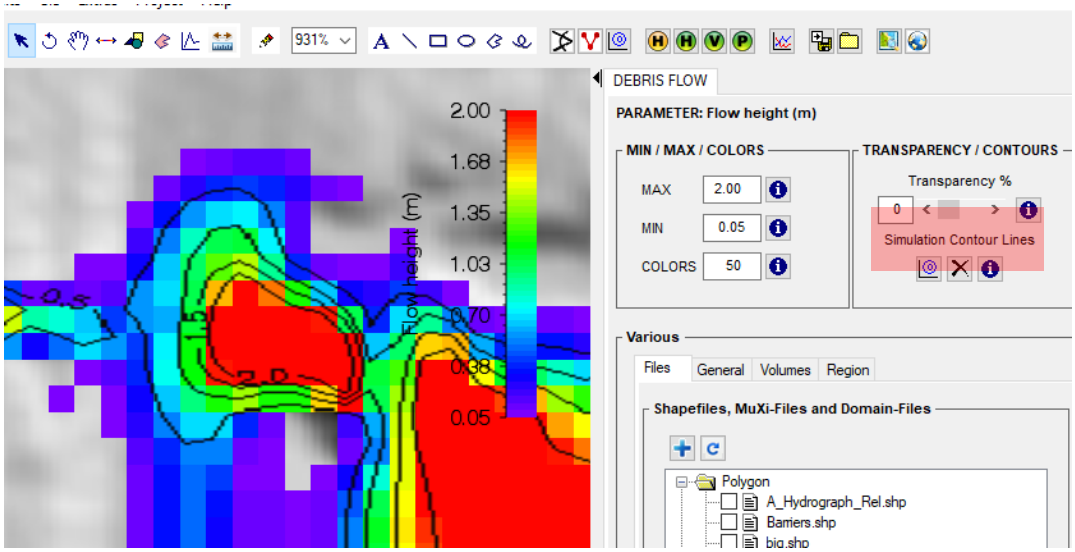


- **New Feature**: **Simulation Contour Lines**: Contour lines of simulation results can be visualized.



Default contour levels are:
- Flowheight (m): 1.0 2.0 3.0 5.0 10.0 (H_CONTOUR_LEVELS)
- Velocity (m/s): 1.0 5.0 10.0 20.0 30.0 40.0 50.0 (V_CONTOUR_LEVELS)
- Pressure (kPa): 1.0 3.0 10.0 30.0 100.0 (P_CONTOUR_LEVELS)

You can change these contour levels by adding the following lines in the Add. Preferences (before the END tag):

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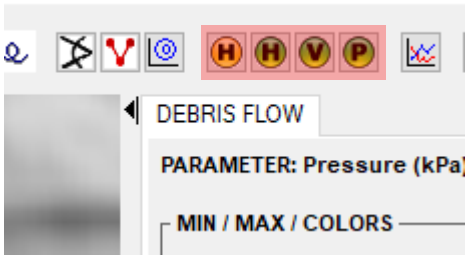
Example:
H_CONTOUR_LEVELS 0.5 1.0 1.5 2.0
V_CONTOUR_LEVELS 5.0 10.0 50.0
P_CONTOUR_LEVELS 3.0 10.0 30.0

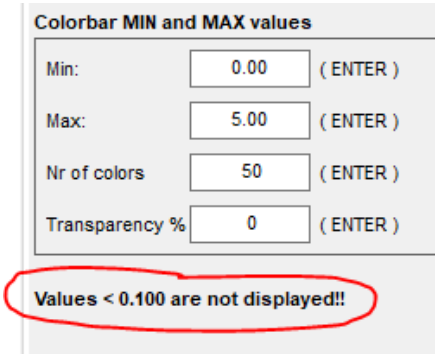
Then click ***Save*** and ***OK***, and then draw new contour lines.

- **New Feature**: **Dump Step Button**: A new button was added to the horizontal toolbar to easily switch between DumpStep- and Max-Values. To animate your simulation, it is necessary to look at DumpStep-Values.

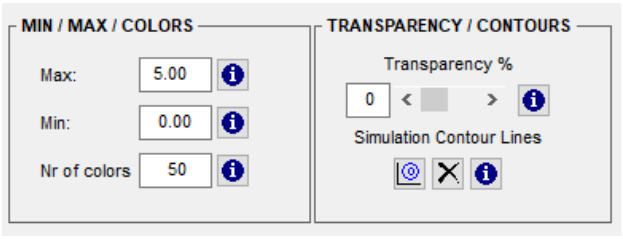


- **Improvement**: **Colorbar**: The handling of the colorbar has slightly changed. Until now, the lowest color band was transparent, resulting in values not being shown. The new colorbar will now show all the values, even very small ones. If you do not want to see very small values, then you have to set the colorbar **MIN** value!

Old Appearance



New Appearance



Transparency can be moved with a slider. New simulation contour lines.

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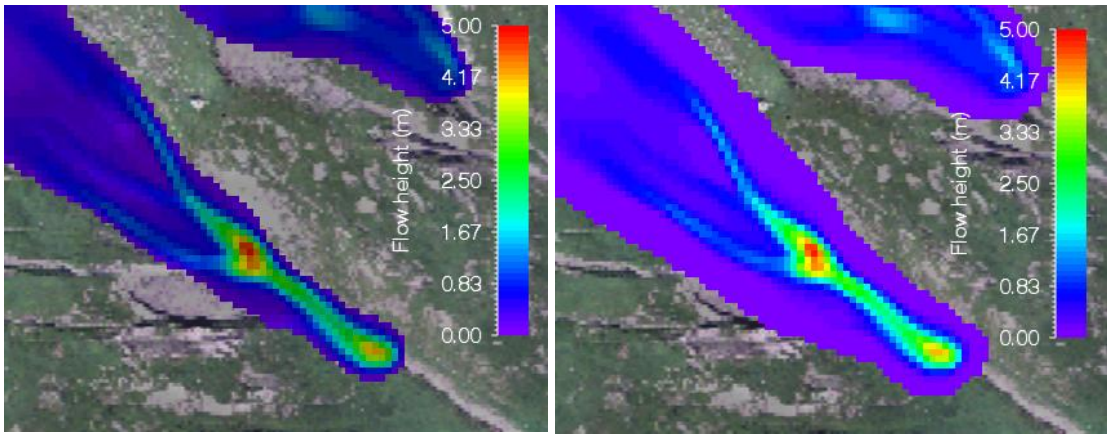
Comparison of old (left) and new (right) colorbar handling (same simulation):



Values < 0.1 are not displayed All values are displayed

If you want to reproduce the same visual result with the new colorbar, you would have to set the Min-Value to 0.1 in the above right example.

- **Improvement**: **Convert irregular XYZ point file to raster**: Only regular XYZ data could be converted to an ASCII raster in RAMMS. **NEW:** Irregular XYZ points can be converted (LINEAR or INVERSE DISTANCE interpolation methods available) to a raster (GEOTIFF or ASCII).
  Track → New… → Convert XYZ Data to Raster Data

- **New Feature**: **Hillshade Visualization:** Use *"Extras → Create Hillshade Image"* to create a hillshade image of your DEM.

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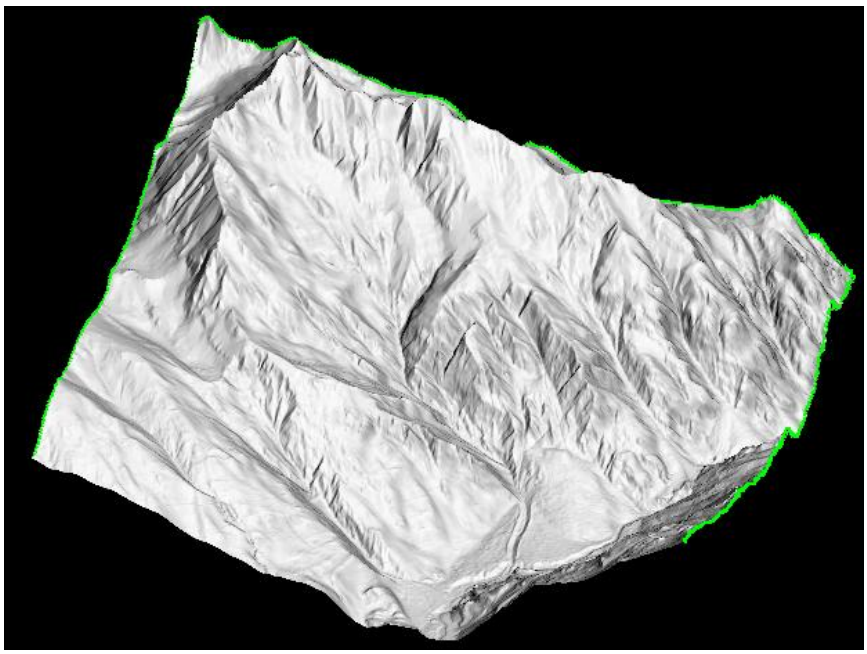
Visualization of DEM Surface

Visualization of hillshade image



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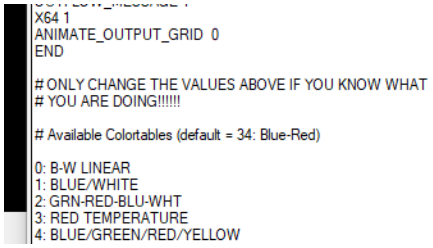
- **New Feature**: **Multiple ASCII- or TIFF-File Export**: Export an ASCII- or TIFF-file for every dump step. This option can be set in ***"Help -> Advanced… -> Additional Preferences… -> Edit"***. Add the following line (before the END tag, see figure below):

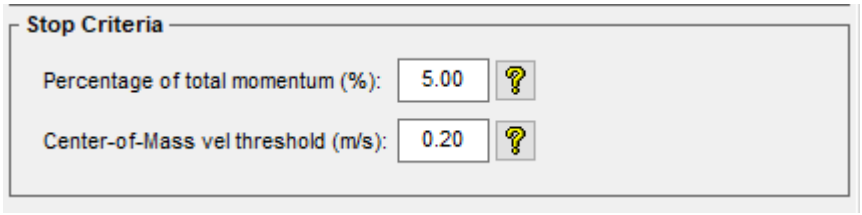
  ANIMATE_OUTPUT_GRID 1

  Then click ***Save*** and ***OK***, and start animating.



- **Improvement**: **Google Earth**: Improved. Only Swiss-, UTM- and StatePlane-coordinate systems available.

- **New Feature**: **New Stopping Criterion – Center of Mass Velocity**: The idea of this new stopping criterion is the following: We follow the center-of-mass (COM) of the flow. We do a new calculation of the COM every 5s for debris flows, and every 2s for avalanches (because they move faster), and then calculate the velocity, with which the COM is moving.
  The user can define a velocity threshold (in m/s), and as soon as the COM is moving slower than the threshold, RAMMS considers the flow as stopped.
  This criterion should only be used, if you simulate one single debris flow problem (catchment). If you define two or more block-releases (for different catchments), then this approach makes no sense. In this case, set the threshold value to zero.



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V 1.7.20 [2018-07-11]

GENERAL

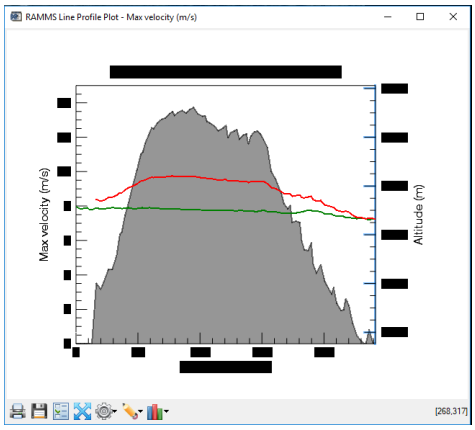
- **Bugfix**: **Line Profile**: Resolved a small bug concerning the line profile. Line profile plots and discharge values are more accurate now.
- **Bugfix**: **Overlapping release areas**: Resolved a bug with overlapping release areas.

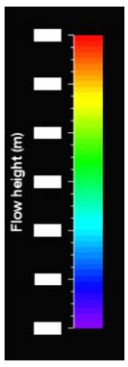
DEBRIS FLOW

- **Bugfix**: **Subtract release depth from DEM**: RAMMS crashed when trying to use the "Subtract release depth from DEM" option with a block release, and NoData values were present in the DEM. Resolved.
- **New Feature**: **Max Erosion ASCII file**: After a successful simulation, RAMMS will automatically export the "Max Erosion" ASCII file.

V 1.7.15 [2018-03-30]

- **Bugfix**: **Colorbar and Plot problem**: Finally, we realized that this is an IDL problem with Windows 10. Many users complained about not seeing numbers and text from colorbars and plots.





You can fix this by running RAMMS in "Windows 7 Compatibility

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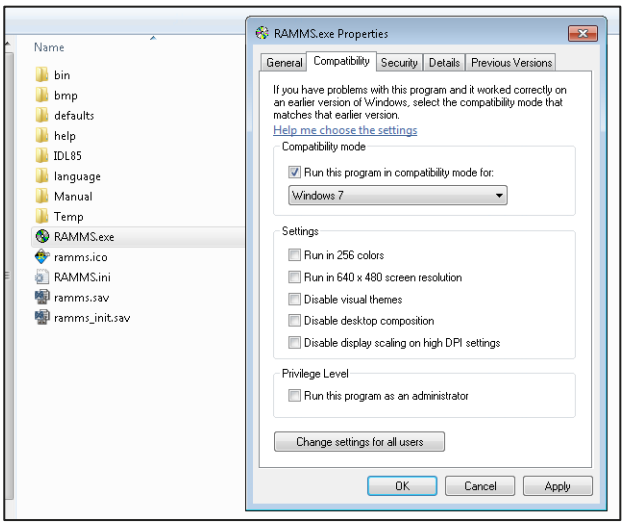
Mode". Please do the following:

- Exit RAMMS
- open Windows Explorer and navigate to your RAMMS installation folder.
- right-click on ***RAMMS.exe***
- choose the tab ***Compatibility***
- select the checkbox ***"Run this program in compatibility mode for:"***
- choose ***Windows 7*** from the dropdown menu
- and then click Apply and OK.
- Restart RAMMS. All your plots and colorbars should be ok now.



- **Bugfix**: **Slope/curvature/contour in output mode**: There was a small bug when looking at slope/curvature/contour plots in output mode and changing min and max values. Resolved.
- **Bugfix**: **Register New Module**: Small bug when creating a new license request file. Resolved.

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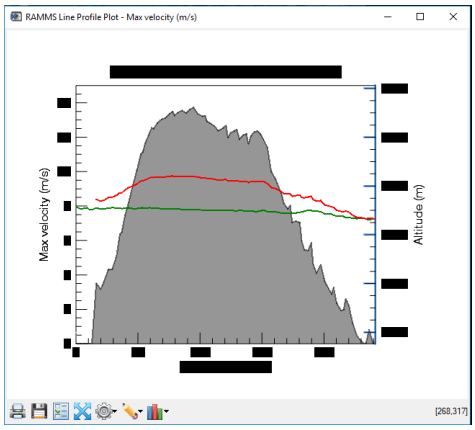
V 1.7.10 [2018-03-06]

GENERAL

- **Bugfix**: **Colorbar and Plot problem**: The colorbar and plot problem from the updates below was investigated further.



If you still have these problems with the new update, then add the following line(s) to the 'Additional Preferences' (Button):
FONTNAME Hershey 3 (you can use any font-name installed on your system)

you can also change the text size of the plots:
FONTSIZE 12 (increase or decrease the number as you like)

or the size of the colorbar text:
CB_FONTSIZE 12

- **Bugfix**: **Server installation**: When installing RAMMS on a server, where only one at a time can use RAMMS, RAMMS got locked by the first user. Even if this user closed RAMMS and logged off, no other user could use RAMMS. Resolved.
- **Bugfix**: **x64 high resolution problem**: When trying to simulate a very large problem (high resolution DEM), and using the x64 option in 'Additional Preferences', RAMMS crashed anyway. Resolved.

  It's recommended to use the X64-Option in the 'Additional Preferences':
  X64 1

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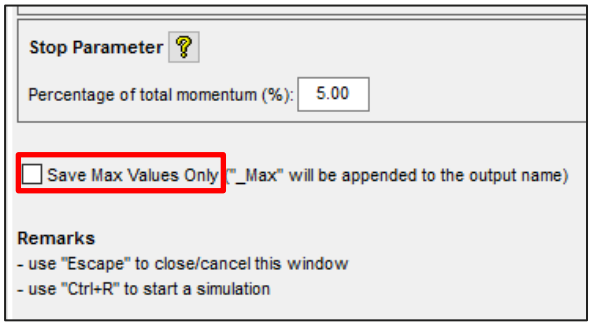
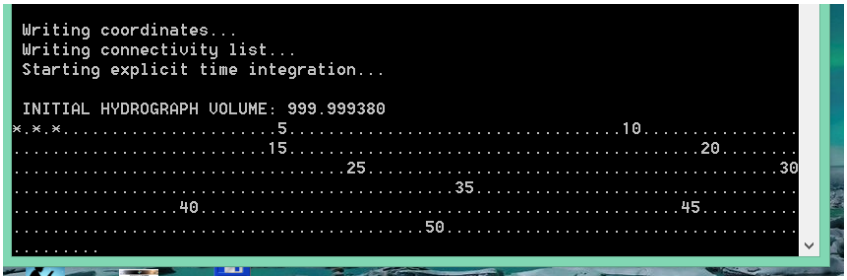
Remark: Using very high resolution DEM's can lead to very large simulation times and very high disk memory usage. It's important to use very narrow and small calculation domains to reduce the scenario size. See 'Calculation Domain' in the manual on how to get an ideal calculation domain.

- **New Feature**: **Simulation with only MAX VALUES saved:** Simulations with a high resolution DEM can lead to a high amount of used disk space. If you want to save disk space and if the max values are all you are interested in, then use this feature.

  Additional remarks:
  - after a simulation finished, all ASCII files (deposition, max flowheight, max velocity and max pressure) are exported automatically.
  - the simulation results cannot be visualized in RAMMS (at the moment).



Click this checkbox to save only Max Values!



DOS-Output-Window: The numbers indicate the simulation time.

- **New Feature**: **Overlapping release areas:** Do you have overlapping release areas, and are not able to select the underlying release area? Use *"Input → Release Area… →*

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Details/Edit Overlapping Release Areas".

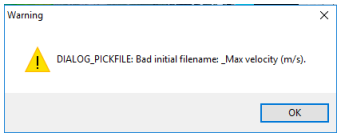
AVALANCHE

- **Bugfix**: **Volume category suggestion**: When creating a new MuXi-File, RAMMS did not suggest a volume category anymore. Resolved.

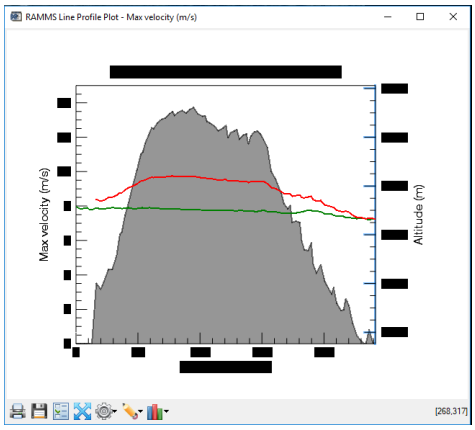
V 1.7.05 [2017-12-19]

GENERAL

- **Bugfix**: ***Enter Coordinates (X/Y)***: Using the menu *"Extras → Point… → Enter Coordinates (X/Y)"*, RAMMS did not create a Time Plot. Resolved.
- **Bugfix**: **Export Result as Shapefile**: Using the menu *"GIS → Export… → Result as Shapefile"* for max velocity, RAMMS produced the following error message and crashed. Resolved.



- **Bugfix**: **Colorbar problem**: The colorbar problem from the update below also produced bad Time- and Profile-Plots.



You can overcome this problem by adding the following line to the 'Additional Preferences':

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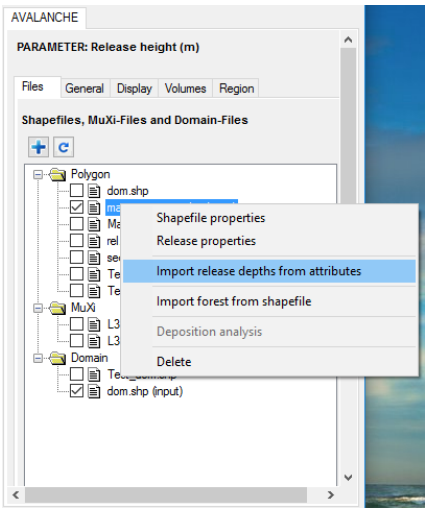
PLOT_FONT_NAME Hershey 3

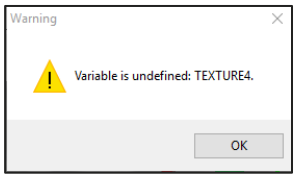
V 1.7.03 [2017-12-12]

GENERAL

- **New Feature**: **Import release depths from attributes.** After the last update, release depths could not be imported from shapefiles anymore, sorry about that! You can do this now by right-clicking a shapefile in the *Files-Tree* in the panel. You can then choose an attribute to import.



- **Bugfix**: Using the menu *"Input → Polygon Shapefile… → Load Existing Polygon Shapefile"* RAMMS produced this warning message, with RAMMS crashing. Resolved.



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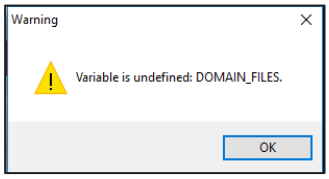
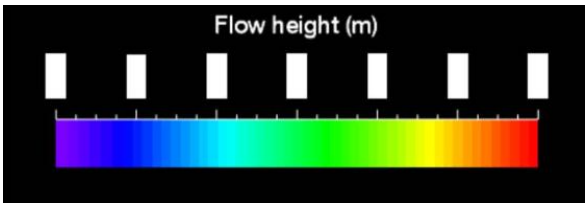
- **Bugfix**: Using *"Add files from external directory"* (Files-Tree) RAMMS produced this warning message, with RAMMS crashing. Resolved.



- **Bugfix**: Very seldom a problem occurred with the colorbar, see white boxes below, making it impossible to read the colorbar tick text. Resolved.



DEBRIS FLOW

- **Bugfix**: *"Help → Manual"* would open the Avalanche Manual. Resolved.

V 1.7.0 [2017-11-29]

DEBRIS FLOW

- **New Feature**: **Erosion** → see manual for more details.
- **New Feature**: Calculation of **flow discharge** for a line profile.

AVALANCHE

- **New Feature**: **Secondary avalanche release** → see manual for more details.

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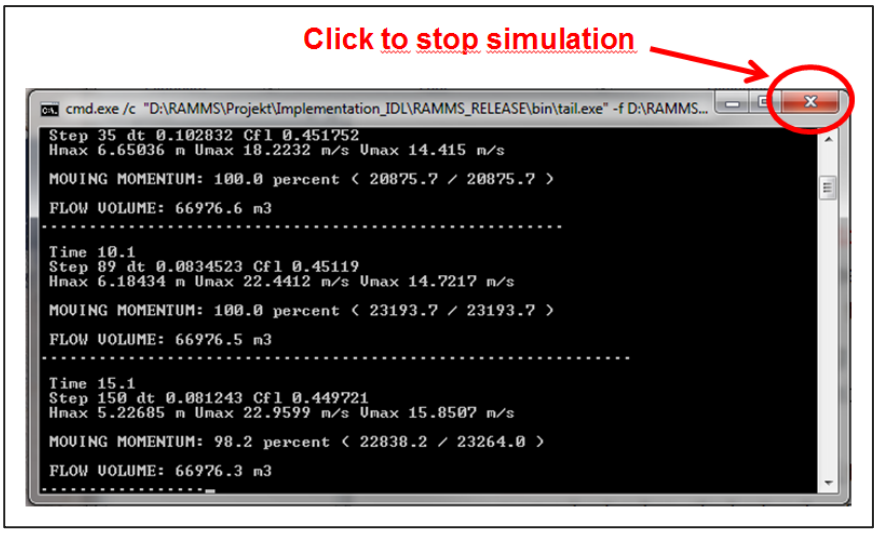
GENERAL

- New Feature: **New file handling.** Multiple shapefiles can be visualized at once. Properties (color, line style and size) can be set separately. More than one polygon shapefile can be used as release shapefile. No need anymore to convert GIS shapefiles to RAMMS release or domain shapefiles.
- New Feature: **64-bit calculation core.** RAMMS will not crash anymore with very large project regions. The calculation core can be set to 64-bit in the additional preferences (default: 32-bit, faster than 64-bit).
- New Feature: Create **envelope shapefile** from simulation results or ASCII files. This feature can be used to create optimized calculation domain shapefiles (saving tremendously calculation time, especially with debris flows).
- Improvement: **Batch-Mode** improved.
- Improvement: **Simulations can be cancelled (both avalanche and debris flow simulations)!!!** Close the simulation-DOS-window (see below)



and RAMMS will stop the simulation and open the simulation up to the calculated time.

- Improvement: Cohesion and Curvature controls added to the 'Params' Tab in the 'Run Simulation' window.
- Improvement: Export to Google Earth options improved.
- Improvement: The new numerical scheme uses a different Hcutoff since Version 1.6.20. If you open an old input file with an

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old Hcutoff value, RAMMS advises the user to change the Hcutoff value.

- Bugfix: When running parallel simulations (more than one RAMMS program open), the first finished simulation also closed the other simulation progress windows. Resolved.
- Bugfix: When overwriting an existing project, the old project was not completely deleted. This could lead to unexpected bugs, when creating a different project with the same name. Resolved.
- Bugfix: Unchecking '*Edit→Show Dataspace Axes*' did not remove the Z-Axis. Resolved.
- Bugfix: Changing the background color in the *Preferences* did not work. Resolved.
- Bugfix: Some small bugs resolved (checking pointer validity, memory, etc.).
- Bugfix: In some cases, Batch Simulations failed due to a small bug in the Save-Routine of RAMMS. Resolved.

V 1.6.40 [2015-04-17]

ROCKFALL

- Official release of RAMMS::ROCKFALL Module
- Web page at http://ramms.slf.ch
- Email: ramms@slf.ch

V 1.6.20 [2014-03-05]

GENERAL

- Bugfix: '*Install Update from local folder*' did not work. Resolved.
- Bugfix: '*AutoWebUpdate*' would not have detected 64-bit processors, updated software would have worked as 32-bit version. Resolved.

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- Bugfix: Colortable-Nr of colorbar can be changed interactively. Did not work before. With *'Help → Advanced... → Color Tables... → View Color Tables'* the available colortables (with index number) can be viewed and with *'Help → Advanced... → Additional Preferences... → Edit'* the colortable can be changed (set COLORTABLENR to the corresponding index number, click ***Save*** and ***OK***).
- Improvement: Memory management generally improved. E.g. before starting a simulation, RAMMS closes the input file. RAMMS then uses less memory.
- Improvement: IDL version updated to 8.2.3.
- Improvement: New *Time Plots* and *Line Profile Plots*.
- Improvement: Summary of Moving Mass shows new plots and tables to analyse the mass flow.
- Improvement: Automatic export of ASCII files after a simulation of: Max flow height, max velocity, max pressure and deposition (last dump step).
- New Feature: Generation of ASCII files (max flow height, max velocity, max pressure and deposition) from multiple output files.
- New Feature: Visualizations can now be deleted from view (file tree in the left panel), Remove Visualization Button ✕.
- New Feature: Draw New Polygon Shapefile; normal polygon shapefiles can be plotted (use this button in the upper horizontal toolbar).
- New Feature: The velocity direction vector can now be plotted as an arrow (use this button in the left vertical toolbar). Arrows will change in size and lengths when zooming into the visualization. The appearance of the arrow can be changed in the *'Additional Preferences'* (ARROW_COLOR, ARROW_FACTOR, ARROW_HEADSIZE, ARROW_LENGTHSCALE, ARROW_THICK).
- New Feature: Improved numerical scheme. Small numerical instabilities in very steep terrain are corrected with the improved numerical scheme. Mass loss is minimized due to a lower Hcutoff. Default Hcutoff = 0.000001m.
- New Feature: Cohesion implemented. The basic Voellmy friction equation has been modified to include cohesion. It increases the shear stress and therefore causes the avalanche or debris flow to stop earlier, depending on the value of the cohesion.
- New Feature: Obstacle/Dam feature implemented. Draw polygons of areas, where no avalanche or debris flow should pass (houses, deflecting dams, obstacles). The flow is deflected.

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- New Feature: Curvature is taken into account in the frictional model. The normal force *N* now includes centrifugal forces arising from the terrain curvature. Typically this increases the friction, causing the flow to slow down in tortuous and twisted flow paths.
- New Feature: RAMMS::Viewer available now! With the viewer, you can look at your RAMMS simulations even if your license expired! You are not able to do new simulations.
- New Feature: *'GIS → Convert Polygon Shapefile… → to RAMMS Domain Shapefile'*.
- New Feature: Button *'Colorbar Properties'* changed to *'Additional Preferences'*.
- New Feature: Shapefile color can be changed in the *'Additional Preferences'* (SHAPEFILE_COLOR).

DEBRIS FLOW

- Improvement: Hydrograph improved: Capturing of improper input and numerical implementation of hydrograph improved.

V 1.5.01 [2012-12-13]

GENERAL

- Bugfix: When changing the background color in the preferences, RAMMS did not save this position. Fixed.
- Bugfix: The vertices of polygon shapefiles were written in both clockwise and counter-clockwise order, depending on how the user clicked the points. ArcGIS is having problems to work with counter-clockwise polygon shapefiles. Polygon shapefiles are therefore written only in clockwise-order.
- Bugfix: *'Help → Advanced… → Hardware Rendering'* did not work. Fixed.
- Bugfix: *'Help → Advanced… → Install C++ Libraries'* did not work. Fixed.
- Improvement: When changing the background color to white, the axes of the project region are still visible, and the text of the colorbar is also white. The axes can be disabled and enabled (*'Edit → Show Dataspace Axes'*), and the text-color of

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the colorbar can be switched between white and black (*'Edit → Colorbar White Color'*).

V 1.5.0 [2012-11-27]

GENERAL

- Bugfix: Bug found in the license procedure. When a user entered a wrong license key, the license was saved anyway, and RAMMS then could not be started anymore. Resolved.
- Bugfix: Negative coordinates did not work anymore in version 1.4.14. Resolved.
- Bugfix: Bug found in the MuXi-classification with a forest cover, if DEM resolution was equal to 10m. RAMMS could not complete the classification and showed an Error Message. Resolved.
- Bugfix: Bug resolved when converting a shapefile to a RAMMS release shapefile.
- Bugfix: Bug found in the GIF-Animation procedure. Two GIF-Animations could not be generated one after the other, because the first file was not closed. Resolved.
- Bugfix: Until now, coordinates were saved as float-values. With high resolution DEM's, this could lead to a loss of accuracy (in the range of 0.1m). Coordinates are now saved as double values.
- Improvement: 64-bit Support! If you have a 64-bit computer (Windows 7), please uninstall your current RAMMS version, download the new 64-bit version from ramms.slf.ch and install it. Your old license key will still work with the new 64-bit version. The 64-bit Version will solve many memory problems, because more dynamic memory can be allocated.
- Improvement: Updated from IDL 7.1 to IDL 8.2.1.
- Improvement: The Map/Orthophoto procedure was improved. RAMMS now finds also maps/orthophotos, that cover the project region only partially! RAMMS also shows a percentage of coverage.
- Improvement: Zoom level resets to 100% when closing an input- or output-file.
- Improvement: RAMMS issues a warning message, if the user tries to draw a release area or a calculation domain in 3D-mode.

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- Improvement: Version 1.5 introduces a new RAMMS application user directory. Prior to version 1.5, the application directory was located here:
  'C:\Documents and Settings\<user name>\.ramms1.X.X' (Win XP)
  or
  'C:\Users\<user name>\.ramms1.X.X' (Win 7)
  For every new version of RAMMS, a new application directory was created, and the old one was copied into the new one, occupying a lot of disk space.
  The new application directory is created only once and is located here:
  'C:\Documents and Settings\<user name>\.idl\slf\ramms' (Win XP) or 'C:\Users\<user name>\.idl\slf\ramms' (Win 7).
- New Feature: Outflow-Volume-Alert – RAMMS alerts the user, if volume is flowing out of the calculation domain.
- New Feature: Annotation-Buttons in the horizontal toolbar can be deactivated (and activated).
- New Feature: New buttons were implemented in the horizontal toolbar (to the right side) – MuXi-File, Slope Angle, Curvature, Contour, Max Flowheight, Max Velocity, Max Pressure, Time Plot, Export ASCII, Show Project Folder, Add/Change Map/Orthophoto.

- New Feature: RAMMS About Box ('Help → About RAMMS') shows whether you are using the 32- or the 64-bit RAMMS version.
- New Feature: Quasi 3D-Visualization of flow height implemented. The flow height can be visualized exaggerated by a factor. This factor can be changed in 'Help → Advanced… → Additional Preferences… → Edit', keyword EXAGGERATION.
- New Feature: Batch-Mode -> Possibility to start up to 50 simulations automatically (e.g. over night). Users can choose, how many computational cores the Batch-Mode should use (quasi parallel simulations, saves computational time!). 'Track → New… → Run BATCH simulations'
- New Feature: Import one (1) attribute from polygon shapefiles (e.g. release depth) when converting them to a RAMMS release shapefile.
- New Feature: Colorbar can be moved anywhere in the screen (Attention, colorbar can get lost now! ☺). Use 'Project → Get Colorbar' to find a lost colorbar.

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- New Feature: Open Project Folder in Windows Explorer from within RAMMS. Use the appropriate toolbar button in the horizontal toolbar or 'Project → Open Project Folder (Windows Explorer)'.
- New Feature: Polyline Shapefiles can be visualized in RAMMS.
- New Feature: User can choose between the operating system's native (hardware) rendering system or a platform independent (software) rendering system for IDL Object Graphics displays. Hardware rendering allows IDL to make use of 3D graphics accelerators that support OpenGL, if any are installed in the system. In general, such accelerators will provide better rendering performance for many object graphics displays. This is typically true for images rendered using texture-mapped polygons (typical for RAMMS). Anyway, there are situations, where it can be better to use software rendering. Hardware rendering can be switched off (and software rendering switched on) by unchecking 'Help → Advanced… → Hardware Rendering'.
- New Feature: Resetting General Preferences. Use 'Help → Advanced… → Reset General Preferences' to reset the General Preferences.
- New Feature: View Google Earth Map Projection Options with 'Extras → Google Earth… → Map Options Help'.

DEBRIS FLOW

- New Feature: Define Additional MuXi Areas → Users can add polygon regions with different mu and xi values (Run → Run Calculation: Mu/Xi Tab). Be careful in using this feature!

V 1.4.14 [2011-11-24]

GENERAL

- Bugfix: An error could happen when RAMMS tried to grid the simulation data. This only happened with small grid resolutions. Resolved.
- Improvement: File tree improved in the right panel.

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- New Feature: Reading DEM-files: RAMMS accepts 'xllcenter/yllcenter' keywords in ASCII-grid files (until now, RAMMS only accepted 'xllcorner/yllcorner').
- New Feature: AutoWebUpdate. When you start RAMMS, it will automatically check for updates on the internet. This could lead to an Error-Message, if your firewall blocks the executable 'idlrt.exe' (this file starts the IDL-Virtual Machine you need to run RAMMS). Please unblock this file for your firewall. You can also disable the AutoWebUpdate-Function by unchecking 'Help → Advanced… → AutoWebUpdate'. The WebUpdate-Function can still be done manually ('Help → Update… → Web Update' or 'Get Update Manually (download to local folder)').
- New Feature: Logging. By default, RAMMS writes status messages in a log file. You can access this file with 'Track → Log Files… → RAMMS Log File (current session) or (last session)'. The '(last session)' log file can be useful in case of a crash. You can disable the Logging-Function by unchecking 'Help → Advanced… → Logging' (this could result in a slightly faster execution of RAMMS, but only slightly).

AVALANCHE

- Bugfix: MuXi error: When the MuXi file was selected in the 'Run Simulation'-window (with the 'Select MuXi File…' button, see picture below), instead of selecting the MuXi file with 'Input → Friction Values… → Load Existing MuXi File', the following happened:
    - the selected MuXi name was correctly displayed in the text field on the left of the button
    - the output log file showed the selected MuXi file
    - **BUT**, RAMMS did not calculate with the selected MuXi File, but used the 'old', previously selected MuXi file instead. **If you frequently used the button in the picture below, you should check your simulations.** Otherwise, you do not have to do anything.

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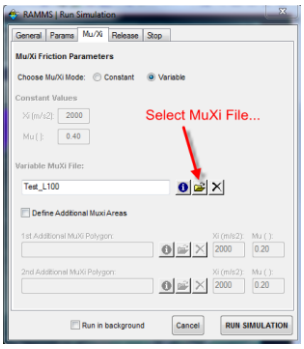

This bug is resolved! MuXi files can be selected with 'Input → Friction Values… → Load Existing MuXi File' or in the 'Run Simulation'-window with the button 'Select MuXi File…' (see picture above).

V 1.4.10 [2011-09-07]

GENERAL

- Bugfix: An error occurred when trying to crop release areas and then cancel the process instead of entering a new name. Resolved.
- Bugfix: Several button-tooltips did not work. Resolved.
- Improvement: When working with large TIFF files, the available memory is checked, and a message appears, if not enough memory is available
- New Feature: New RAMMS Modules can be registered directly in RAMMS ('Help → Register New RAMMS Module').

AVALANCHE

- Bugfix: An error occurred when trying to re-calculate an old project with old MuXi files (Shapefile-type). This error is resolved.
- Bugfix: An error occurred when trying to calculate a new MuXi file with a grid resolution of 10m. This error is resolved.
- Improvement: Create New MuXi File: The Global Parameters Window is automatically shown when creating a new MuXi file.

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DEBRIS FLOW

- Official release of RAMMS::Debris Flow Module
- Web page at http://ramms.slf.ch
- Email: ramms@slf.ch

V 1.4.07 [2011-08-09]

Cygwin/GRASS has been removed from the RAMMS software package. RAMMS does not use Cygwin/GRASS anymore. Due to major problems on Windows 7 we decided to remove Cygwin/GRASS. Therefore major changes were made in this RAMMS version, see below.

- Installation: You can install RAMMS wherever you want now. 'C:\Program Files\RAMMS' is possible. BUT, 'blancs' and 'special characters' are still not allowed in project names and working directories.
- New Project: The creation of a new project is significantly faster without Cygwin/GRASS!
- MuXi-Files: The automatic classification of mu and xi is more accurate and MUCH FASTER now. Due to the improved classification procedure, the result of a muxi-classification is not exactly the same as in the earlier version. Fortunately, the differences are very small and therefore not significant for simulation results.
- MuXi-Files: The muxi-values are saved as ASCII-files, and not as shapefiles anymore. However, old muxi-shapefiles can still be imported, visualized and simulated.
- MuXi-Files: MuXi-Values are only visualized within the calculation domain!

Some other new features and improvements:

- New Feature: File-Tree available in the right Avalanche panel. Release-, MuXi-, Forest-, Calculation Domain- and Shapefile-Files within the project directory are listed in the file-tree. Select any file and it will be displayed immediately.

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- New Feature: Run a simulation in the background. Simulations can be run in the background, you can continue to prepare a new simulation and start more simulations simultaneously.
- New Feature: Jump directly from a simulation to the corresponding input file. A new button has been added to the vertical toolbar:
- New Feature: Zoom with mouse wheel.
- Improvement: Handling of maps and orthophotos is improved. RAMMS does not crop maps/orthophotos anymore and you don't have to save these cropped maps/orthophotos all the time. RAMMS uses always the same original file for the visualization.
- Improvement: Error handling improved. RAMMS should crash less. In case of an error, RAMMS shows an Error-Windows, but RAMMS does not crash anymore. If you experience a crash, please report the circumstances to ramms@slf.ch!
- Bugfix: It happened that the settings in the Global Parameters were not accounted for correctly when calculating a MuXi-file. This bug is corrected.
- Bugfix: Some MuXi-values for *Tiny-10year* were missing in the *Automatic MuXi Procedure* window. This bug is corrected.

V 1.3.16 [2010-11-11]

- New Feature: Drawing of lines and polygons (Line-Profile; Release-, Domain- and Forest-Polygons) changed. Problems of closing the lines and polygons with a double-click were reported. Lines and Polygons are to be closed now with a **RIGHT MOUSE CLICK**.
- New Feature: Raster information available! Until now, the raster information used in GRASS was available in the GIS/GRASS logfiles. To make it easier to check whether FOREST and DEM raster information is available, this information can be viewed in the 'Project'-menu.
- New Feature: Colors of the Colorbar can be changed! With 'Help -> Advanced... -> Color Tables... -> View Color Tables' the available Color Tables can be viewed and with 'Help -> Advanced... -> Additional Preferences... -> Edit' the Color Table can be changed.

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- New Feature: Map/Orthophoto-Selection-Window enlarged. The width of the window can be set in the 'Additional Preferences'.
- New Feature: RAMMS informs one week before expiration of the license. The expiration date can be looked at in 'Help -> About RAMMS'.
- Improvement: Grid resampling improved. Until now, every grid was resampled, even if the calculation resolution matched the DEM resolution. Matching resolutions are not resampled anymore. Simulations can now be performed on exactly the input DEM!
- Improvement: Estimation of release volume improved. With matching calculation / DEM resolutions (see above) the estimation of the release volume is improved significantly.
- Improvement: Conversion of Polygon Shapefiles to RAMMS Forest Shapefile improved.
- Improvement: The routine to produce a GIF-Animation was improved. The delay of the images within a GIF-Animation can be controlled by the parameter 'GIFANIM_DELAY_TIME' in the 'Additional Preferences', see above. The value represents the delay in hundredths (1/100) of a second.
- Bugfix: 'Commas' as decimal points or changed order of header lines in ASCII DEM files resulted in a program crash. This bug is resolved.

V 1.3.08 [2010-08-19]

- Bugfix: A small error was found when dealing with FORESTED areas below 'Altitude Limit 1' (in Switzerland below 1500 m.a.s.l.). It's possible that too high values of 'mu' are used for the forested areas in the MuXi-file.

V 1.3.05 [2010-03-23]

- Improvement: Improved memory management, RAMMS uses less memory now.
- Improvement: Colorbar handling improved. The colorbar changed size when zooming. This was very annoying. Resolved. Font size and font type can be changed now.

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- Improvement: Export image feature improved: Only GIF and TIFF images could be exported until now. New file types: .bmp, .jpg, .pict, .jp2
- New Feature: 30-day Demo Version available. See http://ramms.slf.ch.

V 1.3.0 [2010-03-01]

- Official release of RAMMS::Avalanche Module
- Web page at http://ramms.slf.ch
- Email: ramms@slf.ch

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