

HEC-RAS Release Notes

Introduction

Version 6.5 Beta of the River Analysis System (HEC-RAS) is now available. This version supersedes previous versions.

A list of major new features can be found here: [New Features](#) (see page 2).

A list of major and minor the bugs fixed between versions can be found in the "Resolved Issues" page. The most recent fixes can be found here: [Resolved Issues](#) (see page 5).

Installation

The installation program and all documentation for HEC-RAS are available on the HEC website at <http://www.hec.usace.army.mil>¹. This new release is installed independently of any previous versions of the software. Users may have the new version and previous versions of HEC-RAS software installed simultaneously for parallel use or testing. HEC-RAS Version 6.4 is fully compatible with projects developed in any previous version of the software.

The installation process includes steps of selecting a directory for the HEC-RAS Version 6.5 software files and making other settings (e.g., creating a desktop shortcut, if desired). Use the following steps to install the program on the Microsoft Windows® operating system:

1. Download the HEC-RAS installation package from the HEC website to a temporary folder on the computer.
2. Run the installation program. In Windows Explorer, double-click the icon for the installation program. Note, you need administrator privileges to run the installer.
3. Follow the on-screen prompts to install the program.

Warning!

HEC-RAS Version 6.0 and newer will only run on 64-bit Windows operating systems, including 64-bit versions of Windows 7, 8.0, 8.1, 10 and 11. Also, make sure your operating system is up to date with all of the Microsoft patches for that version of the operating system before trying to install HEC-RAS.

Support Policy

Technical support for program users within the Corps of Engineers is provided through an annual subscription service. Subscribing offices can expect full support from HEC staff in the routine application of

¹ <http://www.hec.usace.army.mil/>

the program. Users are strongly urged to consult with HEC staff on the technical feasibility of using the program before beginning a project with unique requirements. Extended support for large or complex projects can be arranged under a separate reimbursable project agreement.

Reporting of suspected program errors is unrestricted and we will reply to all correspondence concerning such errors. We are continuously working to improve the program and possible bugs should always be reported. Reports should include a written description of the steps that lead to the problem and the effects that result from it. If we cannot reproduce the reported problem, we may ask you to send a copy of your project.

Report program errors through the following channels:

- Go to our web site at hec.usace.army.mil² then go to the HEC-RAS support page.
- Send email to ras@usace.army.mil³.

New Features

Hydraulic Structure Weir Computations - Weir flow computations have been improved for hydraulic structures connected to 2D cells. Previously, the water surface was computed based on water surface elevation values at the cell face points. The new method utilizes the face points and the center of each face along the hydraulic structure for computing the water surface profile for the headwater/tailwater. This new computation method will increase the accuracy with which weir flow is computed and give different answers from previous versions. In addition, the hydraulic structure is now checking the hydraulic connectivity between adjacent cells to more accurately compute the water surface at the face point.

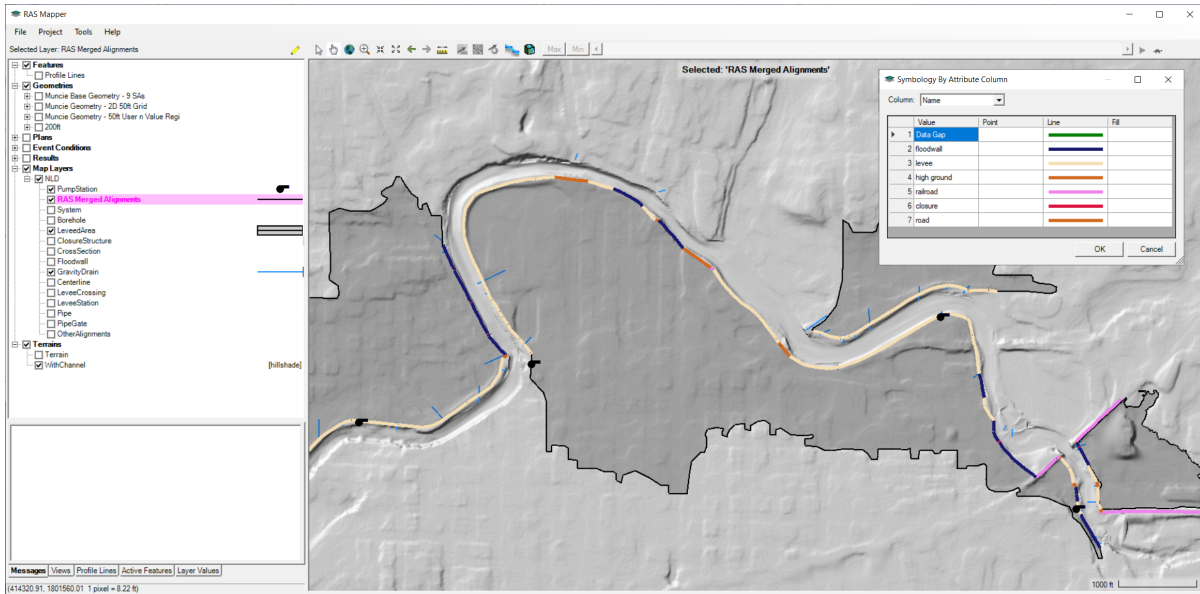
Simplified 2D Bridge Improvements - Simplified 2D bridge modeling refers to the approach of using 1D bridge hydraulic calculations to estimate changes in water surfaces through bridges as a function of flow and enforcing the 2D flow model to match the 1D bridge curves. The approach is designed for capturing the overall energy losses through a bridge with a 2D model for all ranges of flows without requiring a high-resolution mesh or modeling the hydraulically challenging pressured flows or overtopping flows in the 2D model. The method is **not** designed for detailed bridge hydraulics within the bridge. Simplified 2D bridges modeling was introduced in HEC-RAS 6.0 and has gone through several revisions in versions. In HEC-RAS 6.5 Beta, the simplified 2D bridge modeling approach has been modified and improved significantly. Importantly, previous versions of HEC-RAS had a limitation on how small cells could be near bridges. HEC-RAS 6.5 Beta removed this limitation and is thus more flexible and user-friendly. The approach for matching the 1D bridge curves is very simple and uses an iterative method for adjusting a spatially uniform simple drag factor at all faces underneath each bridge. Several new time-series plots are available for 2D bridges within 2D areas including the drag factor and total head-loss through the bridge.

National Levee Database⁴ - HEC-RAS has incorporated the ability directly download and utilize NLD data within a RAS Terrain as a Terrain Modification. The NLD organizes data by Levee System and individual levee Segments. The Levee System is a continuous alignment line with elevations, while the levee Segment provided other information about the sections of the levee. Each levee Segment is comprised by a particular feature type (Centerlines, Floodwalls, and Closure Structures). There are additional features in the NLD; however, the information along the Levee System are the pieces of information (levee alignment and elevations) HEC-RAS will use for the Terrain Modification.

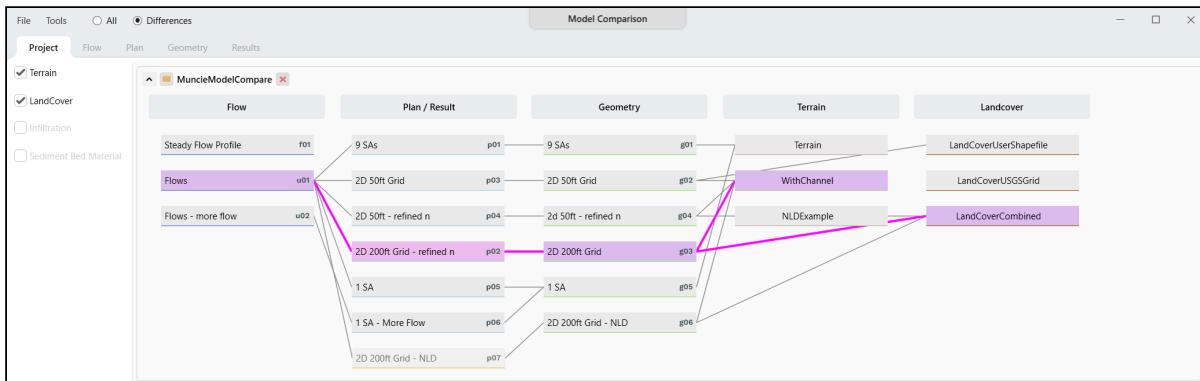
² <http://www.hec.usace.army.mil/>

³ <mailto:ras@usace.army.mil>

⁴ [https://www.hec.usace.army.mil/confluence/display/RMUM/.Terrain+Modification+v6.5.Beta#id-.TerrainModificationv6.5.Beta-NationalLeveeDatabase\(NLD\)Data](https://www.hec.usace.army.mil/confluence/display/RMUM/.Terrain+Modification+v6.5.Beta#id-.TerrainModificationv6.5.Beta-NationalLeveeDatabase(NLD)Data)



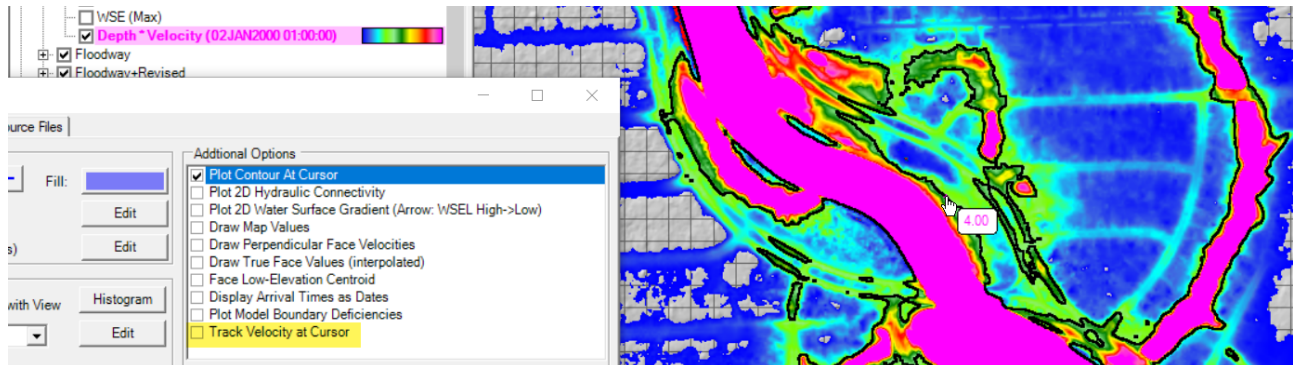
Model Comparison Tool⁵ - The Model Comparison Tool in HEC-RAS is intended to allow users to evaluate the components of an HEC-RAS project to identify differences in the primary modeling objects. Differences in the project files, geometry, flow, and results can be visualized through tables and spatial plots.



River	Reach	River Station	Length LOB	Length Channel	Length ROB	Manning Data	Ineffective Regions	Profile
9 SAs	White Muncie	8434.332	319.24	323.83	333.44			
1 SA - More Flow								
9 SAs	White Muncie	7864.487	323.13	373.65	481.3			
1 SA - More Flow	White Muncie	7864.487	147	147	147			
9 SAs	White Muncie	3952.406	218.17	261.6	298.8			
1 SA - More Flow	White Muncie	3952.406	218.17	261.6	298.8			
9 SAs	White Muncie	570.1187	383.75	332.47	321.89			
1 SA - More Flow	White Muncie	570.1187	383.75	332.47	321.89			
9 SAs	White Muncie	237.6455	67.07	237.65	257.89			
1 SA - More Flow	White Muncie	237.6455	67.07	237.65	257.89			

⁵ <https://www.hec.usace.army.mil/confluence/display/RASUM/.Model+Comparison+Tool+v6.5.Beta>

Encroachments - The Floodway Encroachment Analysis tools have been improved for version 6.5. This includes several bug fixes including the saving data Terrain Modification Slope and Additional Fill properties, improvement of the Terrain Modification routine, allowing culverts in the floodplain to be blocked, and updating data layers and plots. New tools for evaluating the floodplain through map values have been added by being able to **Plot Contour at Cursor** and **Track Velocity at Cursor**. The *Plot Contour at Cursor* will interactively contours the selected dataset using the value of map cursor, while the *Track Velocity at Cursor* plot option will trace a longitudinal and transverse velocity based on the cursor's location.



Sediment Features - Version 6.5 includes several significant sediment features.

Capacity Only/Concentration Only Sediment Modeling Modes(2D):

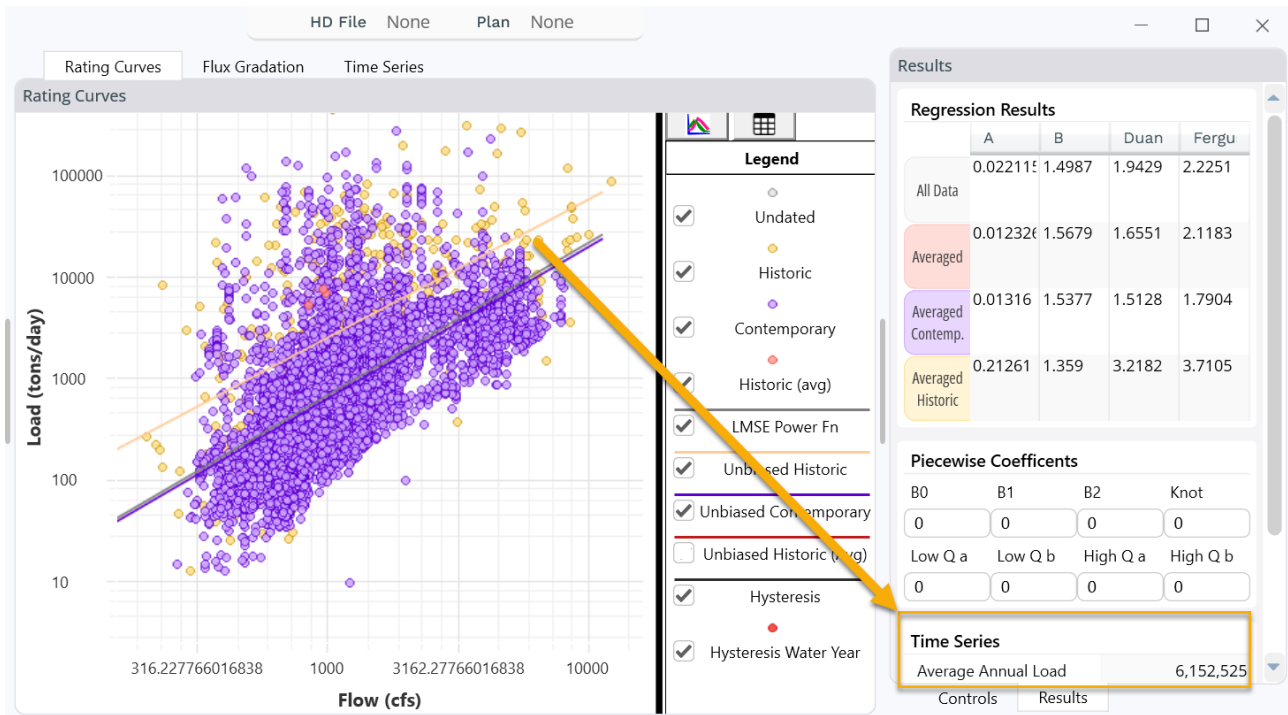
The 2D sediment model includes these two "fixed bed" sediment modeling approaches, that add value and information over "competence" type shear stress analyses, but do not require the modeling effort, data, or run time of a full mobile-bed, sediment transport model.

Note: Version 6.5 will include an 2D sediment capacity only example data set. This is available in version 6.4.1, but was not documented in those release notes.

Updates to the Sediment Rating Curve Calculator:

Version 6.5 includes several improvements and updates to the sediment rating curve calculator.

- The tool computes the piecewise linear regression based on the stationarity analysis (historic=data before the stationarity threshold and contemporary=data after).
- The annual load computation updates based on piecewise linear and/or stationarity selections in the model (see figure below).
- The tool can convert flow and load data between US Customary and SI (metric) units.
- The tool averages same-day data by default.



Length Scale for the Rouse-Diffusion 1D Deposition Method:

The Rouse-Diffusion method under predicts floodplain deposition for wide floodplains because concentration is a function of the wetted width of the floodplain. Version 6.5 includes an optional (but encouraged) user defined length scale that allows users to focus the deposition region to the natural levee zone near the channel. This will increase deposition over the current method, but still limits deposition to the grain classes and concentration that is available to deposit.

The final 6.5 release will also include several sediment features that are not in the beta release.

Resolved Issues

📅 24 Oct 2023 HEC-RAS 6.5 Beta released

Major Issues

Issue	Description
Sediment Rating Curve Calculator Does not Update Annual Load	The new Annual Load feature in 6.4/6.4.1 does not update based on user decisions. It computes based on the Duan corrected, non-averaged, initial data input and will not update for clustering, piecewise linear, or other rating curve updates. There is no work-around in 6.4.1, but this has been fixed for the 6.5 beta release.

Issue	Description
Sediment Rating Curve Calculator is Unit Naïve	The Rating Curve Calculator assumes US Customary Units. This means the labels are wrong and the Load<-->Concentration conversion is incorrect if users import SI data. If users are importing data from the USGS database, this is not an issue, because the tool imports in US Customary. But if users import their own data (through the clipboard) this labels and the concentration conversion will be wrong.
Floodway Encroachments - Blocked Culverts	Blocked culverts will now no longer stop the unsteady flow analysis simulation from not running.
Floodway Encroachments	Fill Slope on Terrain Modifications and Additional Fill Rise values now saving.
Pump - Advanced Control Rules not saving if editing in RAS Mapper	Pumps Advanced Control Rules (from the Pump Editor in the Geometric Data Editor) are not saving if Geometry is edited in RAS Mapper. However, you can create advanced Rules in the Unsteady Flow Editor to replace pump logic.
Pump - The total number of Pumping Stations limited to 20	If there are more than 20 pumping stations in the model a " Program Exception - access violation " will occur at the start of the run. Additional text will be written out including " 1708 Jobinit ". Workaround: Reduce the number of pumping stations to 20. It would be time consuming and awkward, but it would be possible to replace a pumping station with a lateral structure or a SA 2D connector and then use a georeferenced gate or culvert for the pump. And then use the Advanced Rules to replicate the pump flow and pump operations.
Hydraulic structures in 2D not checking hydraulic connectivity between cells connected to structure	When weir flow is computed for a structured connected to a 2D area, a profile of the water surface is developed from the cell faces connected to the structure. The development of this profile was not taking into account hydraulic connectivity between cells leading to a less accurate weir flow calculations.
Culvert Barrels / Gate Openings - not saving alignment in RAS Mapper	After editing the alignment of an existing Gate/Culvert/Outlet Time Series/Rating Curves for Hydraulics Structures within RAS Mapper, the edits will not be saved. New culverts will save.
Re-compute of property tables for 2D Area when updating 2D Connections	2D Area hydraulic tables are recomputed during simulation if the 2D Connection Elevations were updated through RAS Mapper.

Minor Issues

Fixed total gate flow over-summing flows from each gate when there were more than 10 gate openings in the Hydrograph plotter.
Fixed profile plots not reloading when a result updates.
Importing a Sediment File into a New Project generates a "Path/File access error."
Fixed a crash when viewing cross sections in the property table plot.
Fixed Mannings n property tables computes from crashing due to too n many discretizations per face.
Fixed the measure line right click menu sometimes taking a long time show.
Fixed being unable to create a calculated layer if there were no results.
Fixed USGS downloads with many files selected taking a while to start downloading.
The Rating Curve Calculator assumes US Customary Units. This means the labels are wrong and the Load<-->Concentration conversion is incorrect if users import SI data. If users are importing data from the USGS database, this is not an issue, because the tool imports in US Customary. But if users import their own data (through the clipboard) this labels and the concentration conversion will be wrong.
Percent Time Inundated Map Layer legend now shows units of percent, not hours.
The Average Annual Load value in the sediment rating curve did not update in version 6.4 and 6.4.1 when users changed their rating curve assumptions. This has been fixed.
Fixed culvert, gate, time series outlet and rating curve outlet changes not saving correctly after changes were made.
Fixed floodplain being completely filled in for cross sections that had empty rows in unsteady encroachment table.
Fixed RAS Mapper panning when it should bring up a menu while editing.
Fixed Histogram crashing when the map's min value is equal to the max value.
Recomputing 2D meshes in RAS Mapper will now throw an error if a cell has less than 3 faces.
Fixed having to recompute property tables if non-mesh geometric elements were changed.

Fixed "Edit 2D Connection Breakline Properties" in RAS Mapper taking a long time to show.