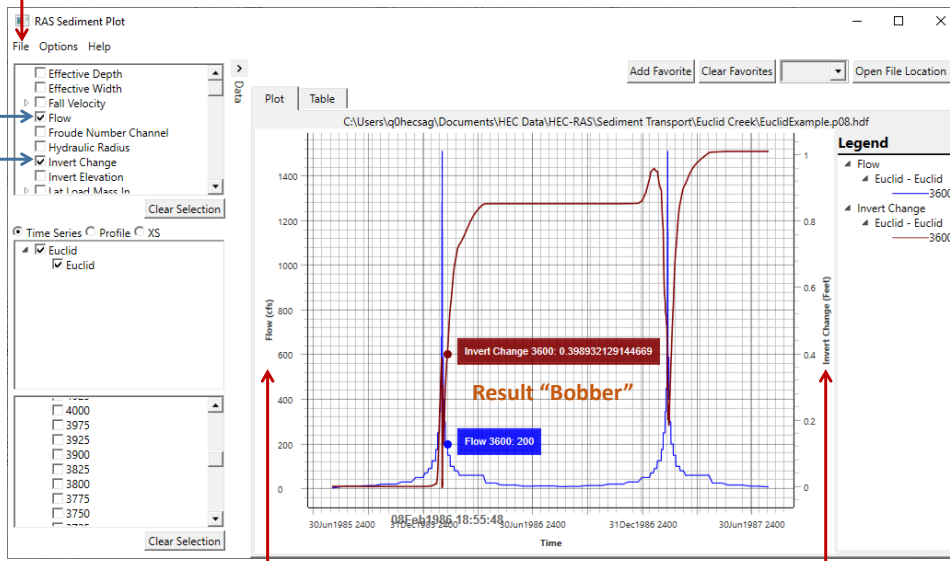


New Output Viewer

View Multiple Plans

Select Multiple Variables



Multiple Axes

1

Quasi-Unsteady DSS Flow Option

Get Quasi-Unsteady Flow Data From DSS File

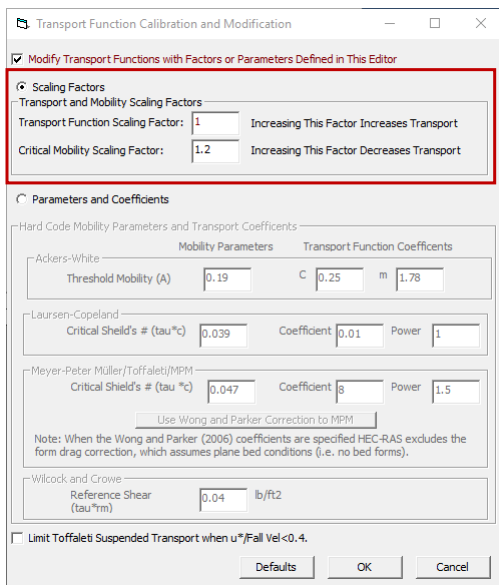
No. Ordinates	Interpolate Values	Del Row	Ins Row
	Simulation Time	Elapsed Time	Flow
		(hours)	(hours)
1	02Jan1984 0000	24	24
2	03Jan1984 0000	48	24
3	04Jan1984 0000	72	6
4	05Jan1984 0000	96	1
5	06Jan1984 0000	120	6
6	07Jan1984 0000	144	6

	Qlow	Qhigh	CI
1	0	10000	24
2	10000	20000	6
3	20000	100000	1
4			
5			
6			
7			

Subdivide DSS Flows into Computational Increments Using the Flow-Dependent CI Tool

2

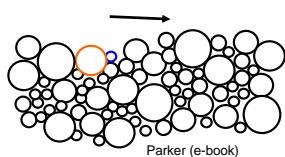
Calibration Scaling Factors For Transport Functions



3

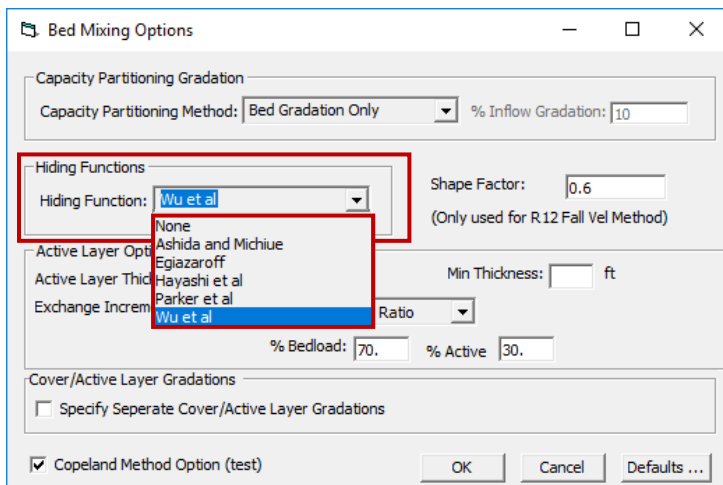
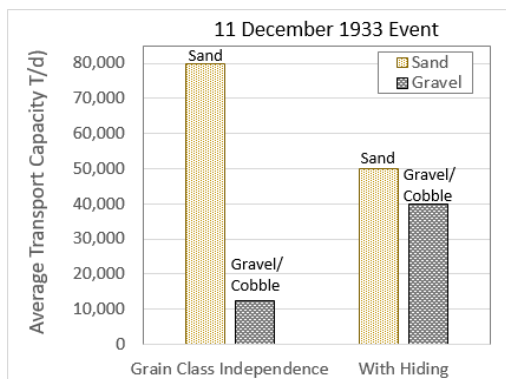
Hiding Features

Hiding



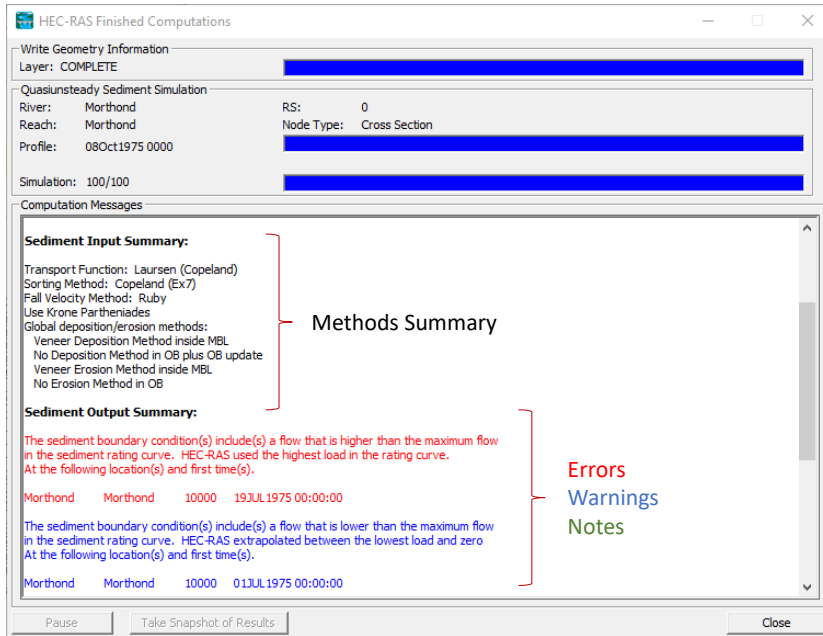
$$\gamma \approx 0.8$$

$$\frac{\tau_{ci}^*}{\tau_{cg}^*} = \left(\frac{d_i}{d_{sg}} \right)^{-\gamma}$$



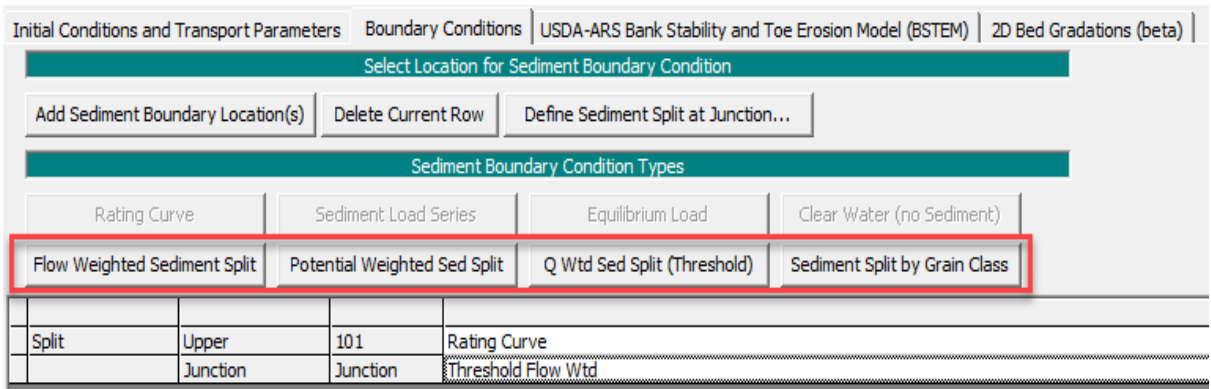
4

Runtime Algorithm Summary and Errors/Warnings/Notes



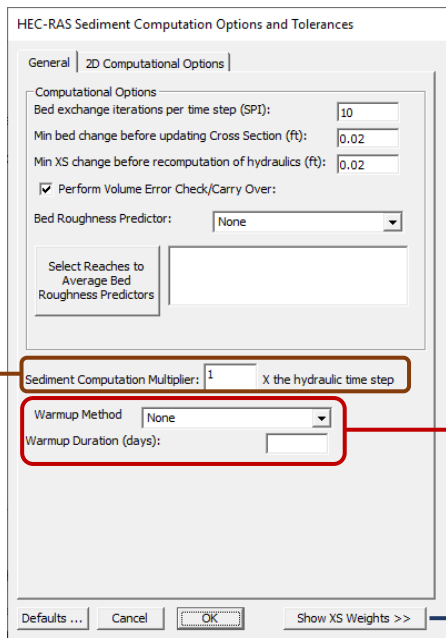
5

Flow Split Options Including Split Flows at a Distributary Based on Potential Instead of Flow



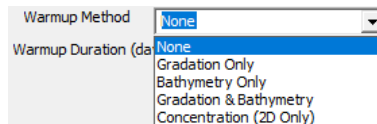
6

Sediment Warmup Period



Warm up:

- Gradation Only
- Bathymetry Only
- Both Gradation and Bathymetry

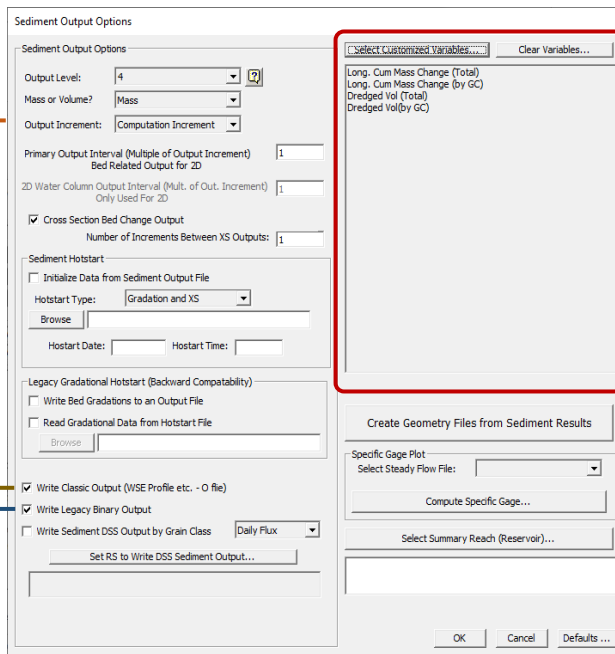


Hide XS weights which should generally not be adjusted

Decouple Unsteady hydraulic and sediment time steps

7

New Output Options



Customized User Output Options

Added Period Averaged Output

User Option to Turn Off Steady Flow Output if it Gets Too

User Option to Turn Off Large Legacy Output File

8

New Output Options

The screenshot shows the 'Sediment Output' configuration window. A table lists various output options, with 'Concentration Daily 10-VCS' selected. Below the table is a line graph titled 'Daily Average Concentration of Very Fine Sand' showing a sharp peak in concentration over time. To the left, a dropdown menu lists 'Daily Flux' as a new DSS output option.

Output Level	Model	Series	Units	Start Date	End Date	Frequency	Duration	Method	Units
4	EuclidExample.P08.sed	IrregularTimeSeries	Euclid Euclid 4075	01Aug1985-01Aug1986	01Aug1985-01Aug1986	IR-Month	1 Year	INST-VAL	mg/l
5	EuclidExample.P08.sed	IrregularTimeSeries	Euclid Euclid 4075	01Aug1985-01Aug1986	01Aug1985-01Aug1986	IR-Month	1 Year	INST-VAL	mg/l
6	EuclidExample.P08.sed	IrregularTimeSeries	Euclid Euclid 4075	01Aug1985-01Aug1986	01Aug1985-01Aug1986	IR-Month	1 Year	INST-VAL	mg/l
7	EuclidExample.P08.sed	IrregularTimeSeries	Euclid Euclid 4075	01Aug1985-01Aug1986	01Aug1985-01Aug1986	IR-Month	1 Year	INST-VAL	mg/l
8	EuclidExample.P08.sed	IrregularTimeSeries	Euclid Euclid 4075	01Aug1985-01Aug1986	01Aug1985-01Aug1986	IR-Month	1 Year	INST-VAL	mg/l
9	EuclidExample.P08.sed	IrregularTimeSeries	Euclid Euclid 4075	01Aug1985-01Aug1986	01Aug1985-01Aug1986	IR-Month	1 Year	INST-VAL	mg/l
10	EuclidExample.P08.sed	IrregularTimeSeries	Euclid Euclid 4075	01Jan1985-01Jan1986	01Jan1985-01Jan1986	1Day	1 Year	PER-AVE	mg/l
11	EuclidExample.P08.sed	RegularTimeSeries	Euclid Euclid 4075	01Jan1985-01Jan1986	01Jan1985-01Jan1986	1Day	1 Year	PER-AVE	mg/l
12	EuclidExample.P08.sed	RegularTimeSeries	Euclid Euclid 4075	01Jan1985-01Jan1986	01Jan1985-01Jan1986	1Day	1 Year	PER-AVE	mg/l
13	EuclidExample.P08.sed	RegularTimeSeries	Euclid Euclid 4075	01Jan1985-01Jan1986	01Jan1985-01Jan1986	1Day	1 Year	PER-AVE	mg/l

9

New Output Options

This screenshot shows the 'Sediment Output Options' dialog box with various settings. It includes a list of variables to output, such as 'Long_Cum Mass Change (Total)'. To the right, two dialog boxes are shown: 'Specific Gage Plot' and 'Specify a Result Summary Reach'. The 'Specific Gage Plot' dialog has a 'Compute Specific Gage...' button. The 'Specify a Result Summary Reach' dialog shows fields for River, Reach, and Stationing, along with a 'Stage-Volume Curve' section.

Update: Write Updated XSs as New Geometry File

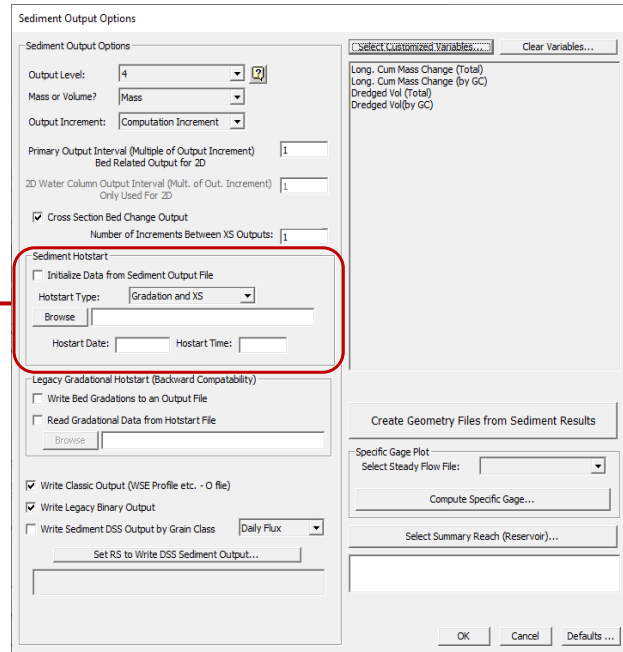
Simplified Specific Gage Options

Reservoir Statistics Summary Reach

10

New Output Options

Hotstart bathymetry and/or gradation from any time step of any sediment output file



11

Flux Weighted Capacity Partitioning

We have always partitioned capacity based on the grain class distribution in the bed:

$$G_s(i) = P(i) * Pot(i)$$

But if the inflowing load includes grain classes not in the bed, they deposit. This feature partitions capacity partially based mostly on the bed but also based on the inflowing load.

So if:

$P(i)$ = % of grain class in the bed

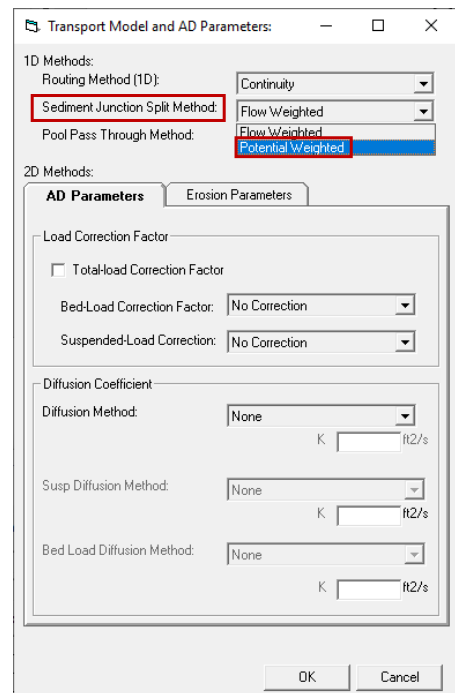
$f(i)$ = % of grain class in upstream flux (mass in)

$F\%$ = User specified percent (e.g. 18% in the figure, default 10%)

$Pot(i)$ = the transport potential of the grain class

Then Capacity ($G_s(i)$) would be:

$$G_s(i) = \underbrace{((100-F\%)/100) * P(i) * Pot(i)}_{\text{Bed Term}} + \underbrace{(F\%/100) * f(i) * Pot(i)}_{\text{Upstream Flux Term}}$$



12

Sediment File Description and Option Flags

Sediment Data - MBL Inversion

File Options View Help

Initial Conditions and Transport Parameters | Boundary Conditions | USDA-ARS Bank Stability and Toe Erosion Model (BSTEM) | 2D Sediment (Beta)

River: (All Rivers) Transport Function: Laursen (Copeland) Define/Edit Bed Gradation ...

Reach: Sorting Method: Copeland (Ex7) Define Layers ...

Number of mobile bed channels: 1 Fall Velocity Method: Ruby

River	Reach	RS	Invert	Max Depth	Min Elev	Left Sta	Right Sta	Bed Gradation
1	Morihond	Morihond	10000	171.7	10	480	540	Coarse-Graded
2	Morihond	Morihond	9500	172.5	0	494	522.7	Coarse-Graded
3	Morihond	Morihond	9000	172	10	480	540	Coarse-Graded
4	Morihond	Morihond	8500	172.8	10	480	540	Coarse-Graded
5	Morihond	Morihond	8000	172	10	480	540	Coarse-Graded
6	Morihond	Morihond	7500	171.9	10	480	540	Coarse-Graded
7	Morihond	Morihond	7000	171.7	10	480	540	Coarse-Graded
8	Morihond	Morihond	6500	171	10	480	540	Coarse-Graded
9	Morihond	Morihond	6000	171.6	10	480	540	Coarse-Graded
10	Morihond	Morihond	5500	171.7	10	480	540	Coarse-Graded
11	Morihond	Morihond	5000	172	10	480	540	Coarse-Graded
12	Morihond	Morihond	4500	171.8	10	480	540	Coarse-Graded
13	Morihond	Morihond	4000	171.5	10	480	540	Coarse-Graded
14	Morihond	Morihond	3500	171.1	10	480	540	Coarse-Graded
15	Morihond	Morihond	3000	171.4	10	480	540	Coarse-Graded
16	Morihond	Morihond	2500	172	10	480	540	Coarse-Graded
17	Morihond	Morihond	2000	172.1	10	480	540	Coarse-Graded
18	Morihond	Morihond	1500	170.9	10	480	540	Coarse-Graded
19	Morihond	Morihond	1000	171.1	10	480	540	Coarse-Graded
20	Morihond	Morihond	500	170.8	10	480	540	Coarse-Graded
21	Morihond	Morihond	0	170.3	10	480	540	Coarse-Graded

Use Banks for Extents Interpolate Gradations

Krone and Partheniades Mixing Methods Selected

Description: ... This is a demonstration file for the HEC-RAS user manual. It is not a real river.

Option flags help users keep track of which options they have selected without looking through all the sub menus. This avoids a lot of errors and duplicated simulations.

The Description box allows users to document the file and provide meta-data that will help them and future users understand the assumptions and data represented.

13

Area-Volume Conversion Methods

Previous versions of HEC-RAS followed HEC 6 using the Simpson rule to convert Volume to Area for bed change and a simple, rectangular control volume to account for the volume-area change in the bed mixing algorithms. This led to mass errors and, in extreme cases, depositing cross sections that were losing mass. We retained this area-volume change option to maintain backward compatibility, but provided options to make the Area-Volume computations consistent between the two algorithms. New models use the Simpson rule by default in both places, but users can also choose a simplified control volume or a new end-area method.

Bed Change Options

Overbank Mass Method: Uniform

Move Mobile Bed Limits to XS Extent if the Channel Fills

Bed Change Options

Global Bed Change Options

Channel: Deposition: Veneer, Erosion: Veneer

Overbank: Deposition: None, Erosion: None

XS Specific Bed Change Options

River: (All Rivers) Reach:

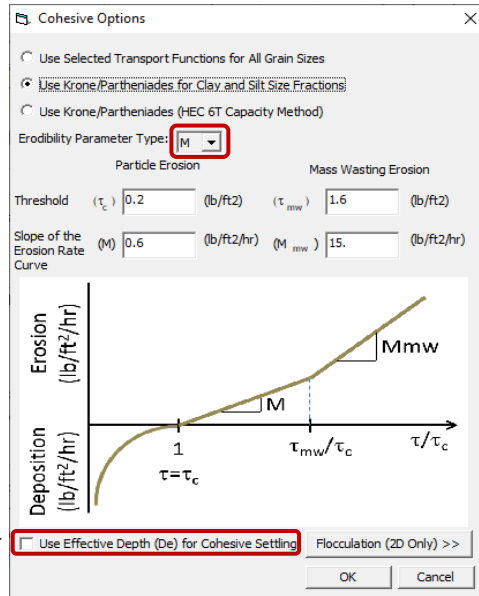
1	River	Reach	RS	Deposition Channel	Erosion Channel	Deposition Over Bank
1	Morihond	Morihond	10000			
2	Morihond	Morihond	9500			
3	Morihond	Morihond	9000			
4	Morihond	Morihond	8500			
5	Morihond	Morihond	8000			
6	Morihond	Morihond	7500			
7	Morihond	Morihond	7000			
8	Morihond	Morihond	6500			
9	Morihond	Morihond	6000			
10	Morihond	Morihond	5500			
11	Morihond	Morihond	5000			
12	Morihond	Morihond	4500			
13	Morihond	Morihond	4000			
14	Morihond	Morihond	3500			
15	Morihond	Morihond	3000			
16	Morihond	Morihond	2500			

Widen channel after it incises to the bottom of the sediment control volume.

Area Method: Backward Compatible

14

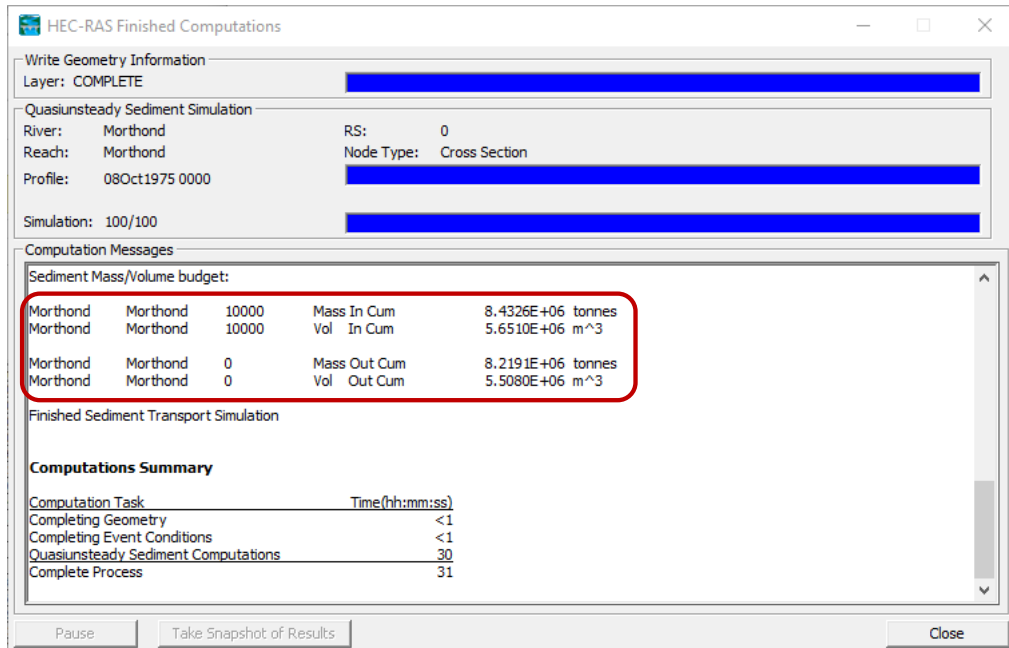
Dimensional or Dimensionless Erodibility Options (i.e. M or Kd Cohesive Options)



Also, we added the ability to apply effective depth to the cohesive settling options.

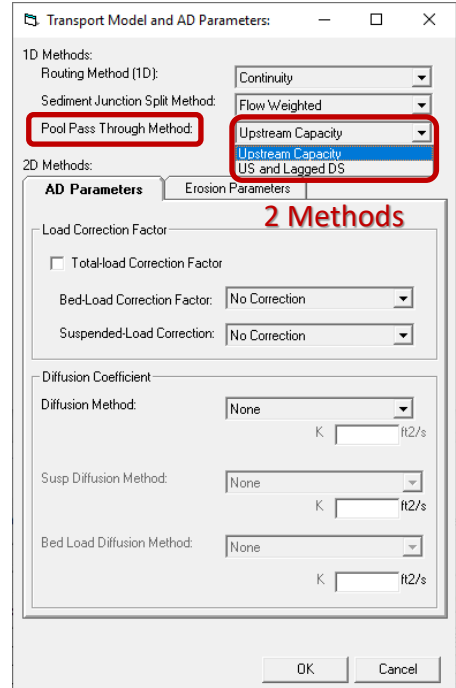
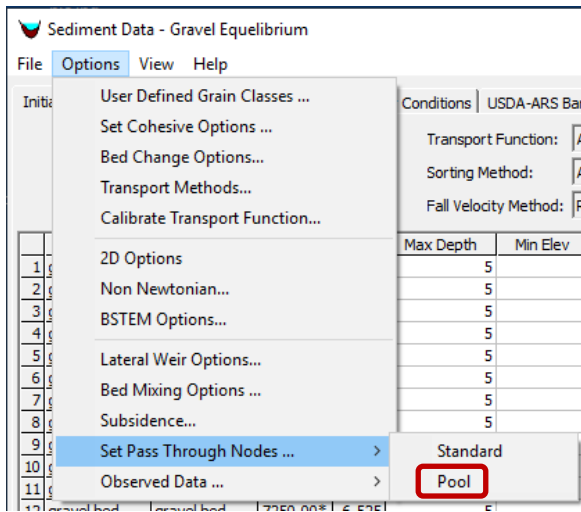
15

Runtime Sediment Budget Summary



16

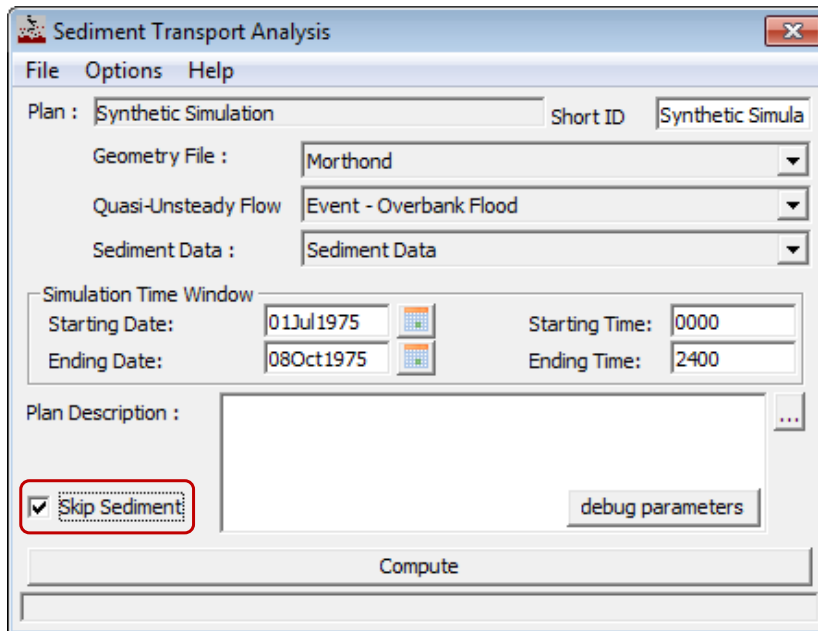
Pool "Pass Through" Method



Computes pool capacity based on bounding cross sections to avoid inappropriate deposition but allow base level change.

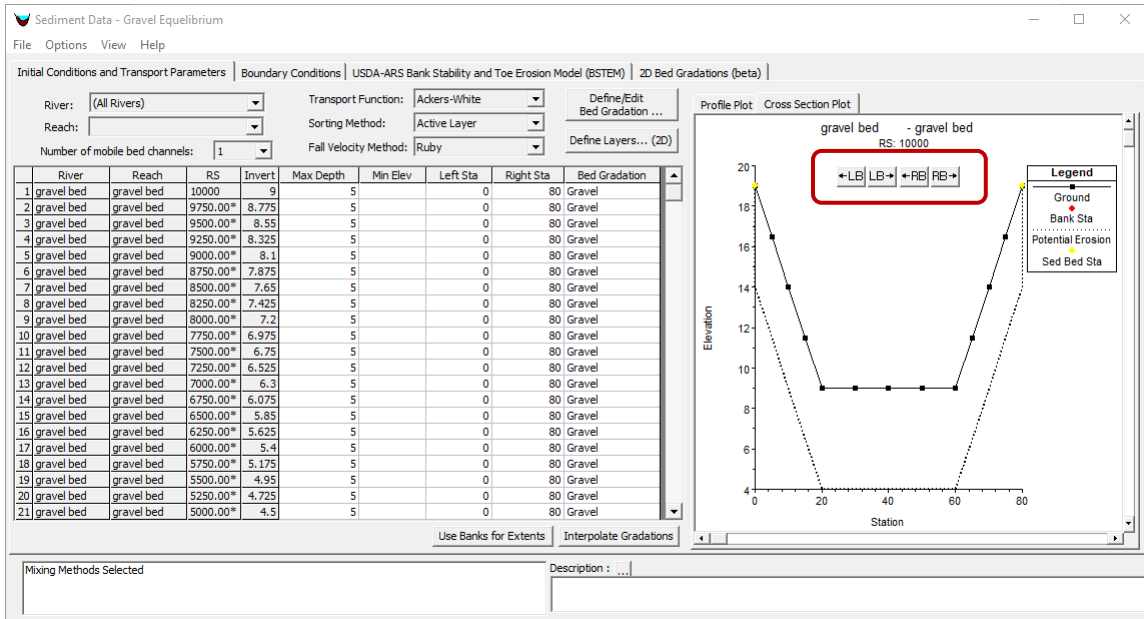
17

Fixed Bed – Quasi-Unsteady Hydraulic Mode



18

Movable Bed Limit Adjustment Buttons



19

Minimum Active Layer Thickness Option

The 'Bed Mixing Options' dialog box is shown with the following settings:

- Capacity Partitioning Gradation:** Capacity Partitioning Method: Bed Gradation Only; % Inflow Gradation: 10.
- Hiding Functions:** Hiding Function: None; Hiding Exponent: 0.8; Shape Factor: 0.6.
- Active Layer Options:** Active Layer Thickness: d90; Min Thickness: 0.2 ft (highlighted in a red box); Exchange Increment Method: Toro-Escobar Ratio; % Bedload: 70; % Active: 30.
- Cover/Active Layer Gradations:** Specify Separate Cover/Active Layer Gradations.
- Copeland Method Option (test).

Constrains active layer to stable thickness for small particles (where 2-3 d90 isn't appropriate or stable).

20

New Observed Profile Data Editor

These are selected from actual RAS output option

Can Attach Observed Profiles

- To the nearest time step
- To a Computed Variable
- As a Generic Named Variable

21

Sediment Boundary Concentration Mode and Conversion

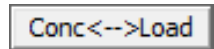
Rating Curve for Arghandab Dahla Dam US 19889.30

Number of flow-load points: 2 sets

Flow (m3/s)	1	1000
Conc (mg/L)	57.87037	27777.78
1 Clay (0.002-0.004)	0.2	0.15
2 VFM (0.004-0.008)	0.3	0.35
3 FM (0.008-0.016)	0.2	0.25
4 MM (0.016-0.032)	0.2	0.07
5 CM (0.032-0.0625)	0.1	0.07
6 VFS (0.0625-0.125)		0.06
7 FS (0.125-0.25)		0.05
8 MS (0.25-0.5)		
9 CS (0.5-1)		
10 VCS (1-2)		
11 VFG (2-4)		
12 FVG (4-8)		
13 MG (8-16)		
14 CG (16-32)		
15 VCG (32-64)		
16 SC (64-128)		

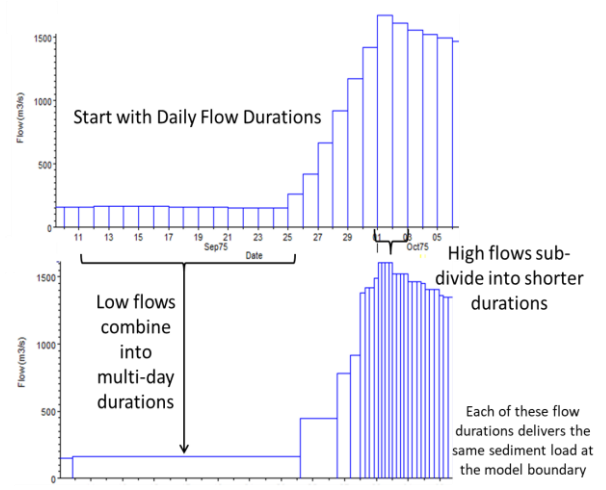
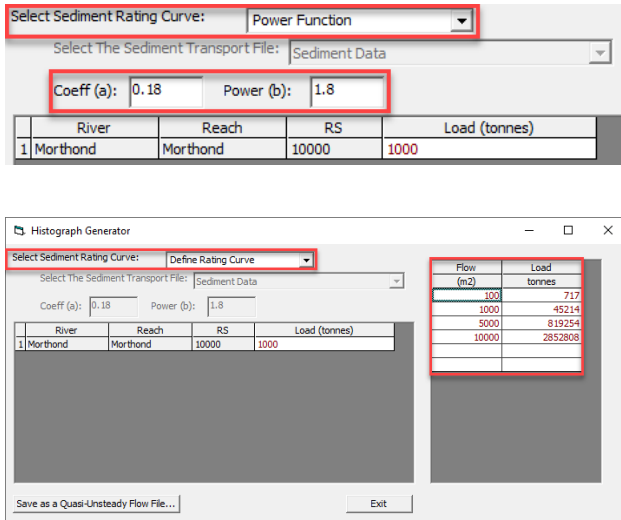
Concentration | Conc<->Load

Recent versions added the ability to specify boundary condition rating curves as concentrations (previous versions were limited to load) and provides a conversion button that automatically converts load-to-concentration or concentration-to-load.



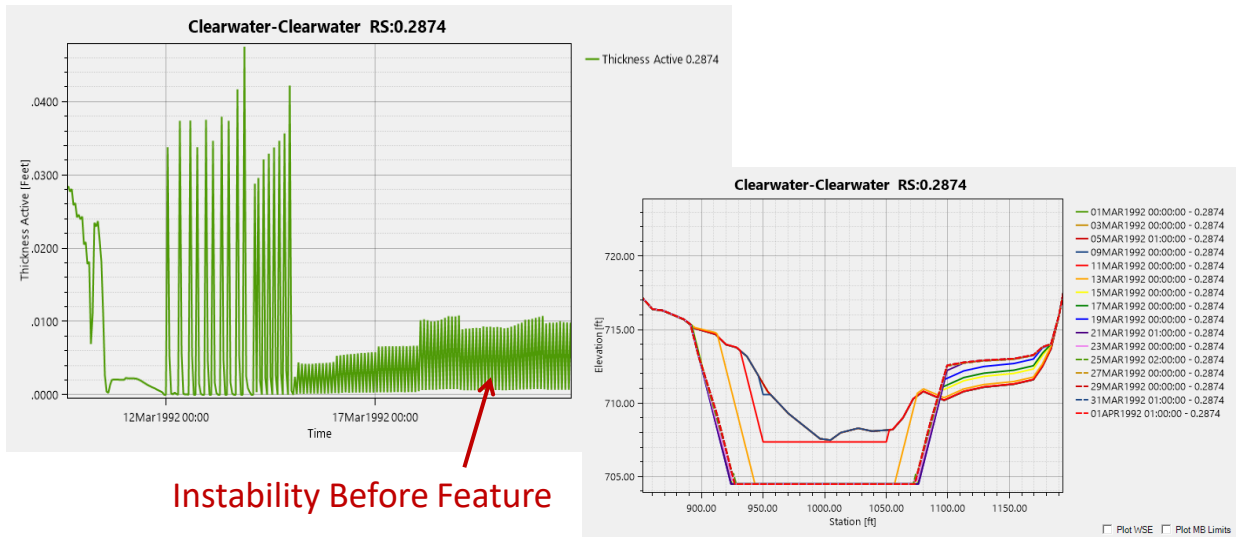
22

Power Function and Rating Curve Features For the Histogram Generator



23

Improvement to bedrock/hard bottom transport



Model uses initial bed gradation to compute capacity when it encounters bedrock or other hard bottoms (e.g. concrete channel) to avoid zero capacity time steps and artificial deposition

24

Mix and Match Overbank and Channel XS Change Options

Bed Change Options

Global Bed Change Options

Channel Overbank

Deposition

Erosion Width Side Slope

Deposition

- No Bed Change Allowed Outside of the Movable Bed Limits
- Allow Deposition Outside of the Movable Bed Limits:
 - Update between mixing time steps.
- Reservoir Option: Deposit More in Deeper Part of the XS

Update to Overbank Deposition
(Usually Corrects Overestimation)

25

Define Overbank and Channel XS Change Options by Cross Section

Bed Change Options

Overbank Mass Method

Move Mobile Bed Limits to XS Extent if the Channel Fills

Bed Change Options

Global Bed Change Options

Channel Overbank

Deposition Decay Coefficient

Erosion

XS Specific Bed Change Options

River: Reach:

	River	Reach	RS	Deposition Channel	Erosion Channel	Deposition Over Bank	Erosion Over Bank	Decay Coeff	Max Width	Side Slope	Center Sta (opt)	Right Dep Limit (opt)	Left Dep Limit (opt)
1	Mortheast	Mortheast	10000										
2	Mortheast	Mortheast	9500										
3	Mortheast	Mortheast	9000										
4	Mortheast	Mortheast	8500										
5	Mortheast	Mortheast	8000										
6	Mortheast	Mortheast	7500										
7	Mortheast	Mortheast	7000										
8	Mortheast	Mortheast	6500	Reservoir					15	0.3			
9	Mortheast	Mortheast	6000	Reservoir	Simplified CEM				15	0.3			
10	Mortheast	Mortheast	5500	Reservoir	Simplified CEM	None			15	0.3			
11	Mortheast	Mortheast	5000	Reservoir	Simplified CEM	Reservoir			15	0.3			
12	Mortheast	Mortheast	4500	Reservoir	Simplified CEM	Distance Decay		0.5	15	0.3			
13	Mortheast	Mortheast	4000										
14	Mortheast	Mortheast	3500										
15	Mortheast	Mortheast	3000										
16	Mortheast	Mortheast	2500										

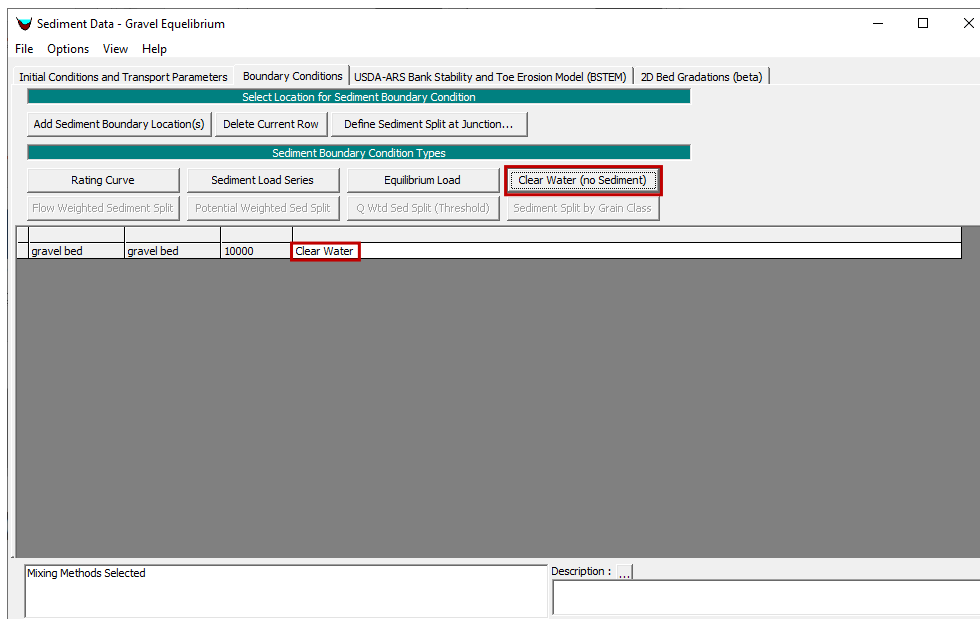
Widen channel after it incises to the bottom of the sediment control volume.

Area Method

OK Cancel

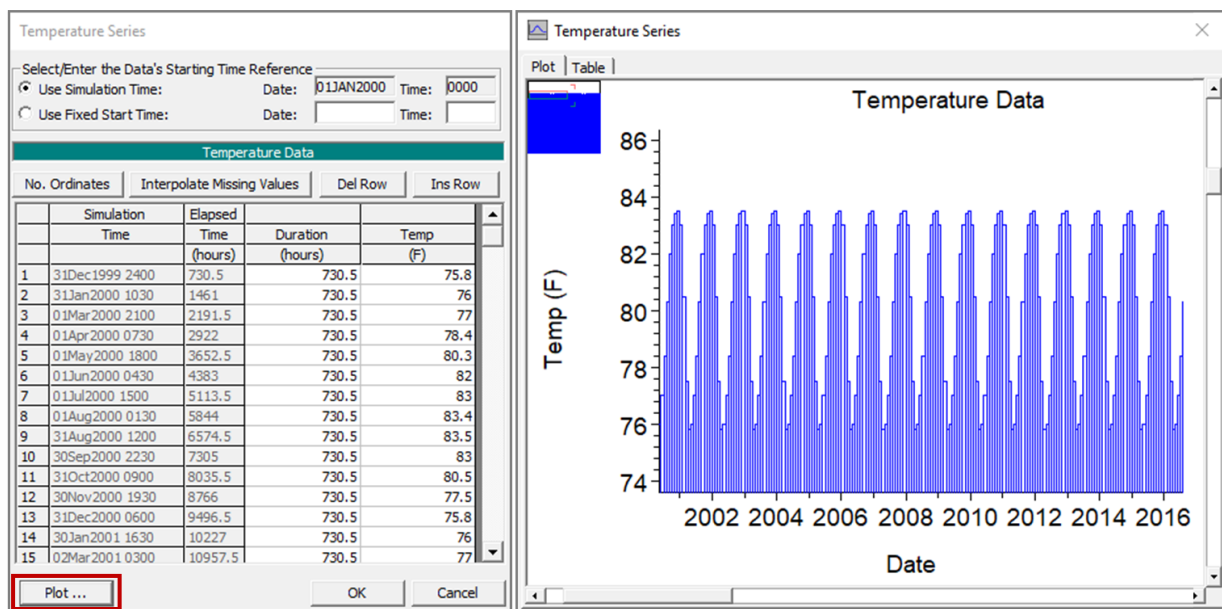
26

Clear Water Boundary Condition



27

Temperature Plot



28