Hydrotec – User's Conference

SMS 14 New Release Feature Highlights

Simulation Based Hydro_AS Modeling

AQUAVEO®

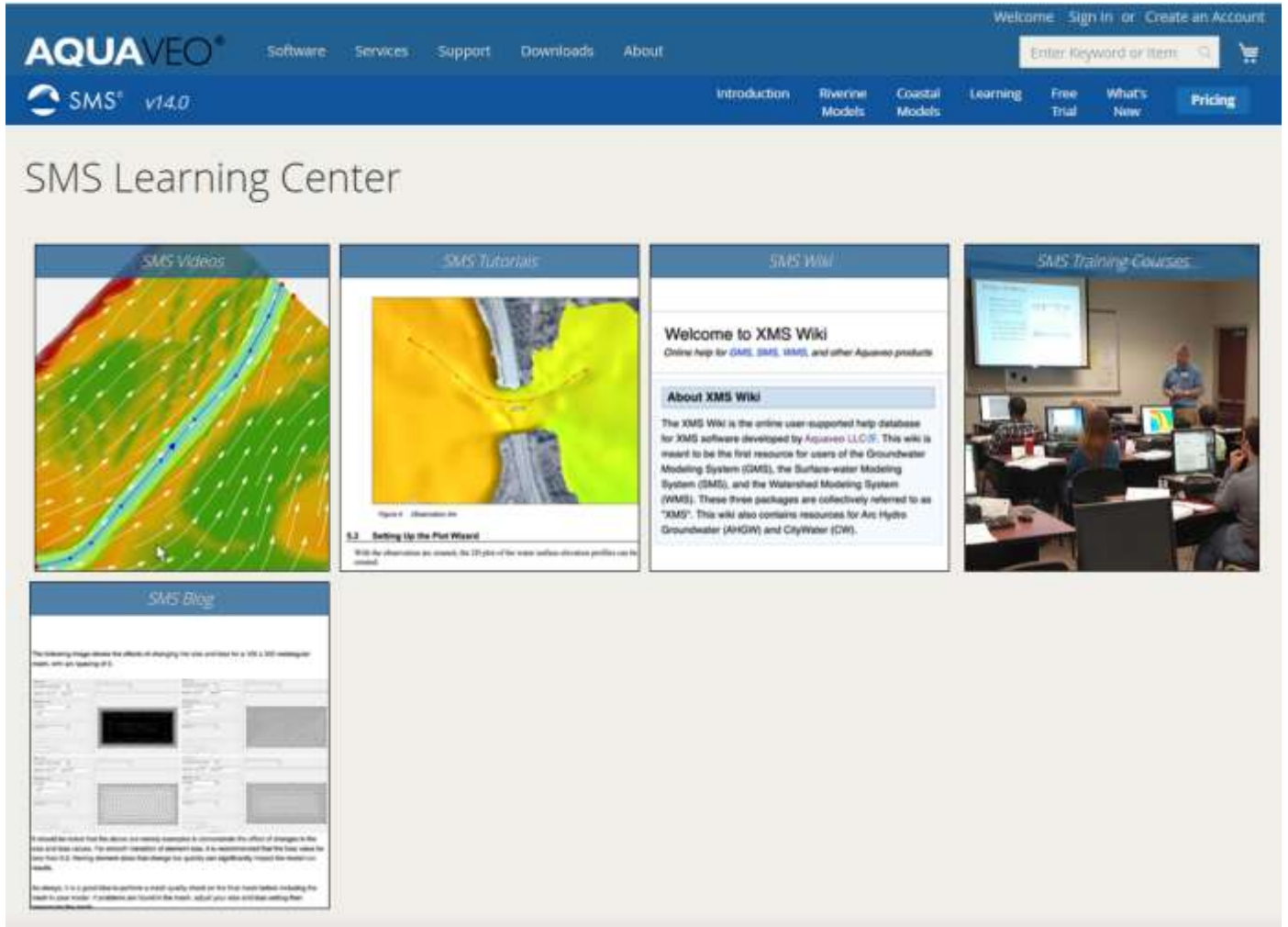
September 15, 2026

Agenda

- Current version of SMS/SRH-2D
- **SMS 14 New Release Feature Highlights**
- **Simulation Based Hydro_AS Interface**

Modeling Resources

https://aquaveo.com/software/sms/models/hydroas
https://aquaveo.com/software/sms/learning
https://aquaveo.com/software/sms/learning-tutorials



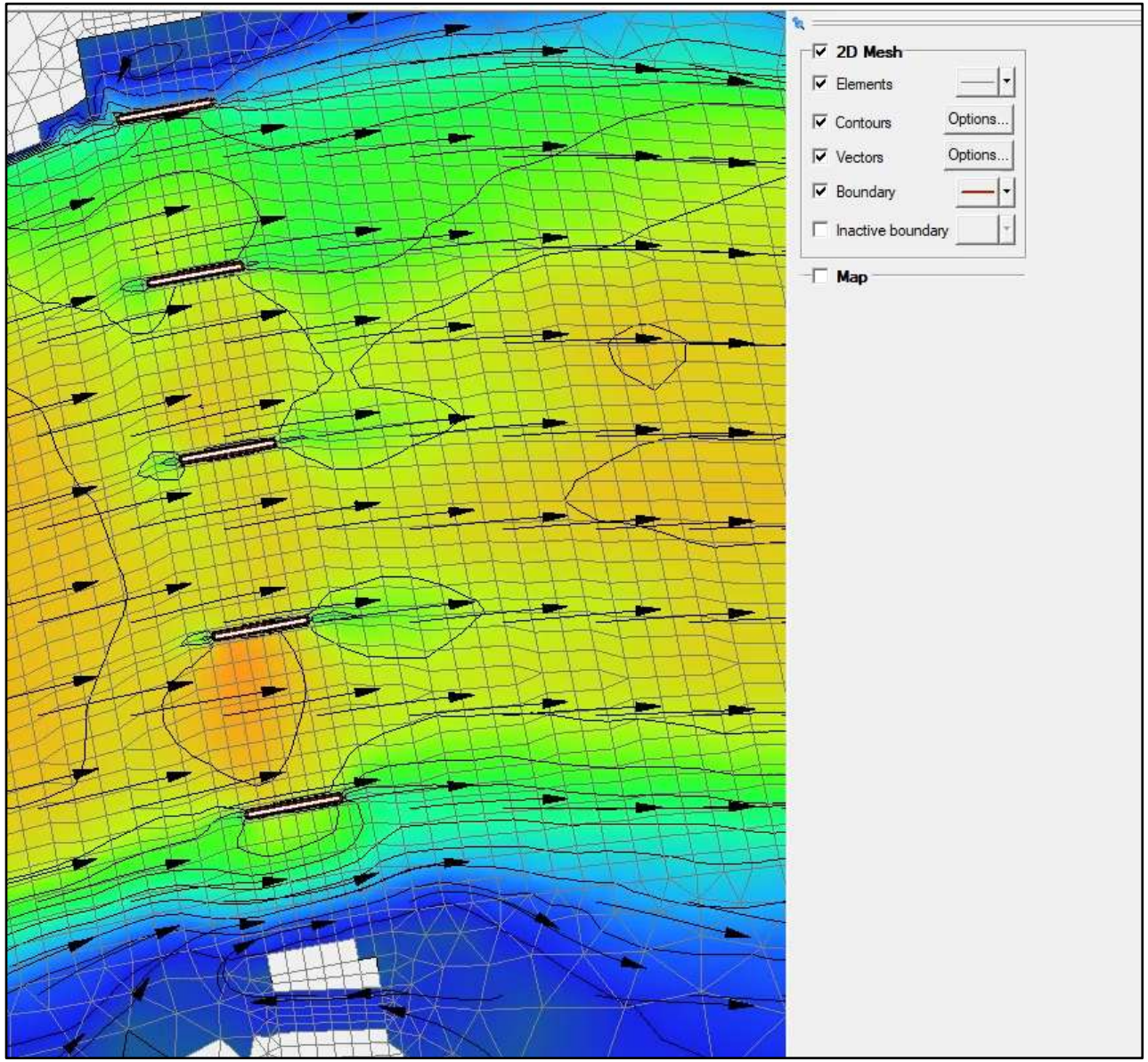
SMS Current Release

- SMS 14.0.4 Build date: September 10, 2026
- New and updated features
  - Quick Display Options
  - Undo /redo support
  - Updates to the Project Explorer folder/tree
  - Variable Contour Range Display
  - Profile plots along any arc
  - Feature extraction improvements
  - Map coverage elevation overrides
  - Select item in project
  - Tool Favorites

SMS 14 Feature Highlights

Quick Display Options

- New feature
- Pinned to upper right corner
- Readily turn mesh and map features on and off
- Buttons to quickly access settings



SMS 14 Feature Highlights

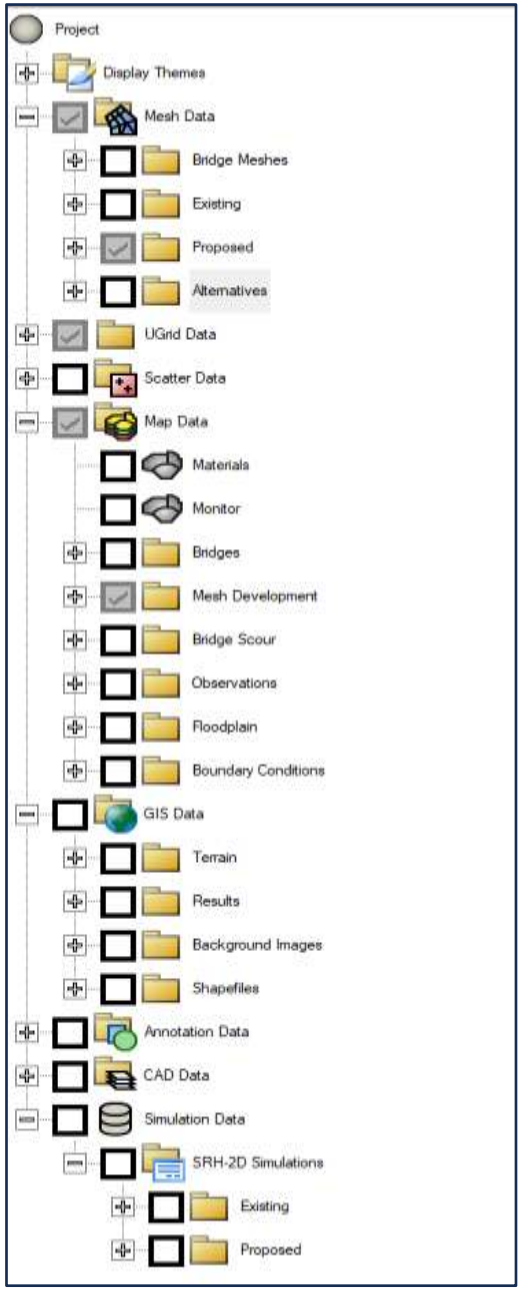
Undo To the Rescue

- Undo – Ctrl + z
- Redo – Ctrl + y
- Currently works on Map Coverage data
- Applies to both geometry and attributes

SMS 14 Feature Highlights

Updates to the Project Explorer folder tree

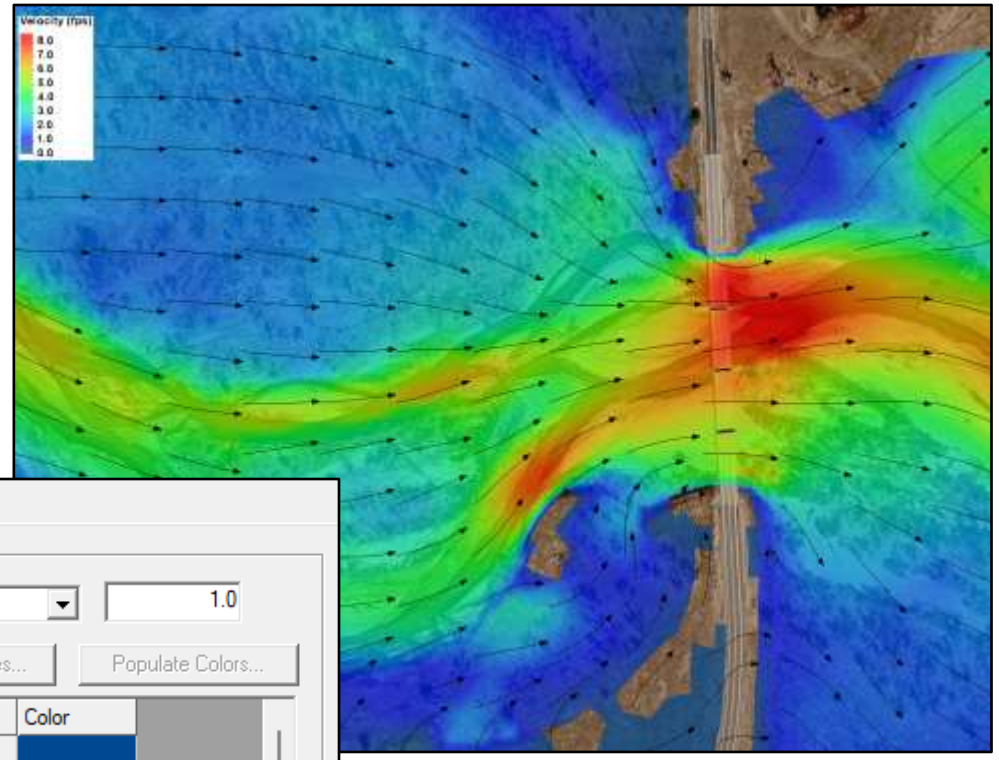
- Additional folder options are available in multiple locations
  - Simulations

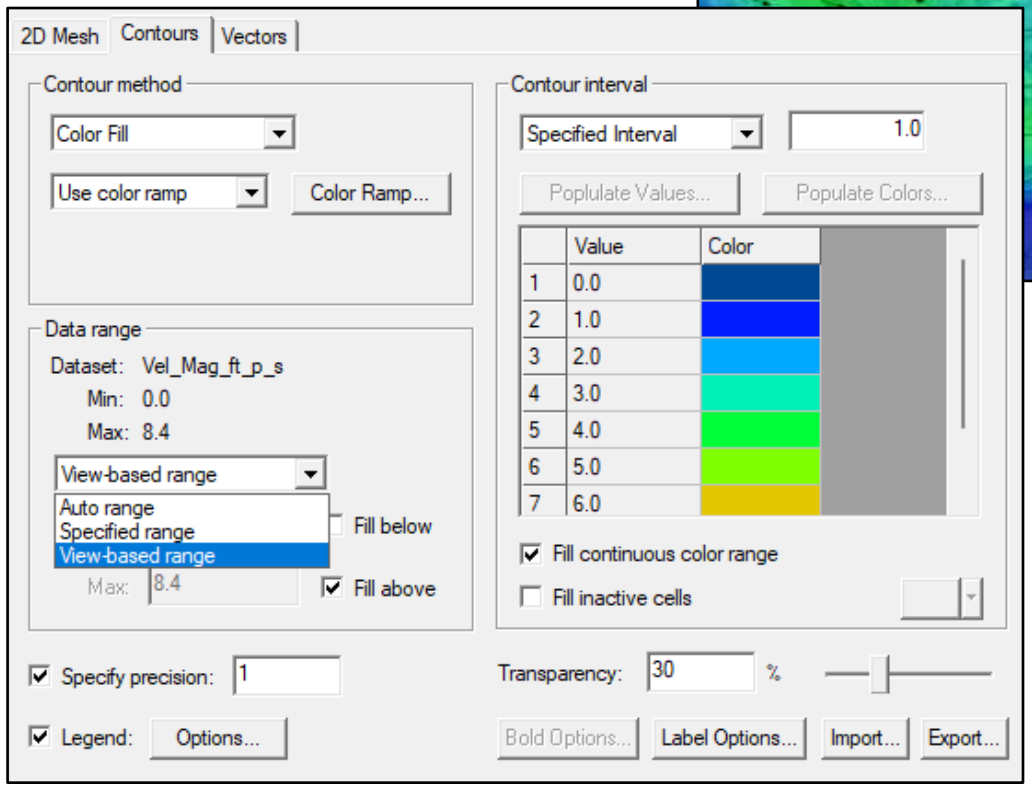


SMS 14 Feature Highlights

Variable Contour Range Display

- Open Display Options
  - Select the View-based Range
  - Update Theme if using Themes



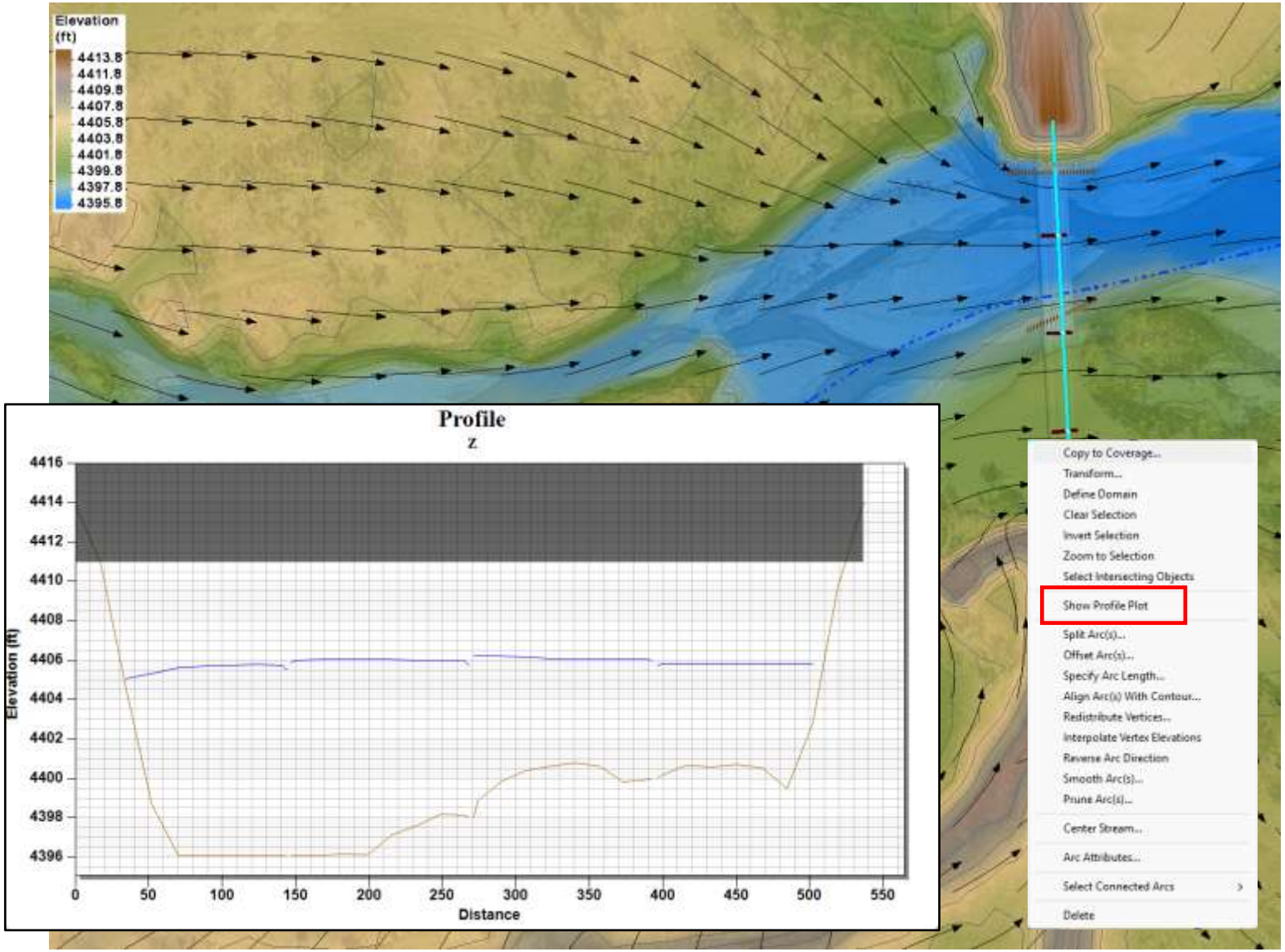


SMS 14.0 Sample Theme file download

SMS 14 Feature Highlights

Profile plots along any arc

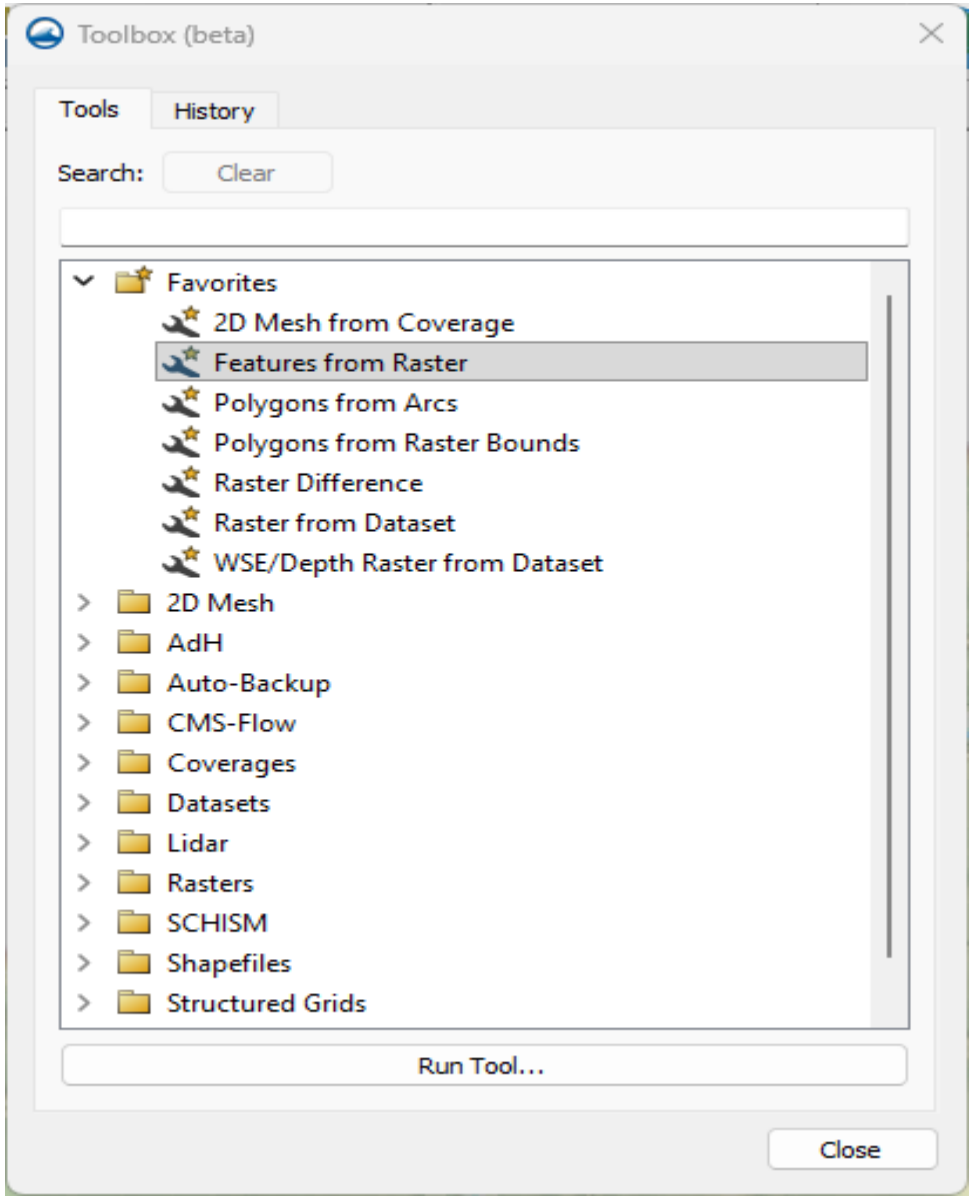
- Right Click on any arc
- Select *Show Profile Plot*
- The active dataset is the default
- Other data sets may be added (right click – plot data)



SMS 14 Feature Highlights

Toolbox Favorites

- Right click on Tool → Add to favorites
- Click on History tab to rerun any previous tools (settings are preserved and can be modified)
- History includes output variable names

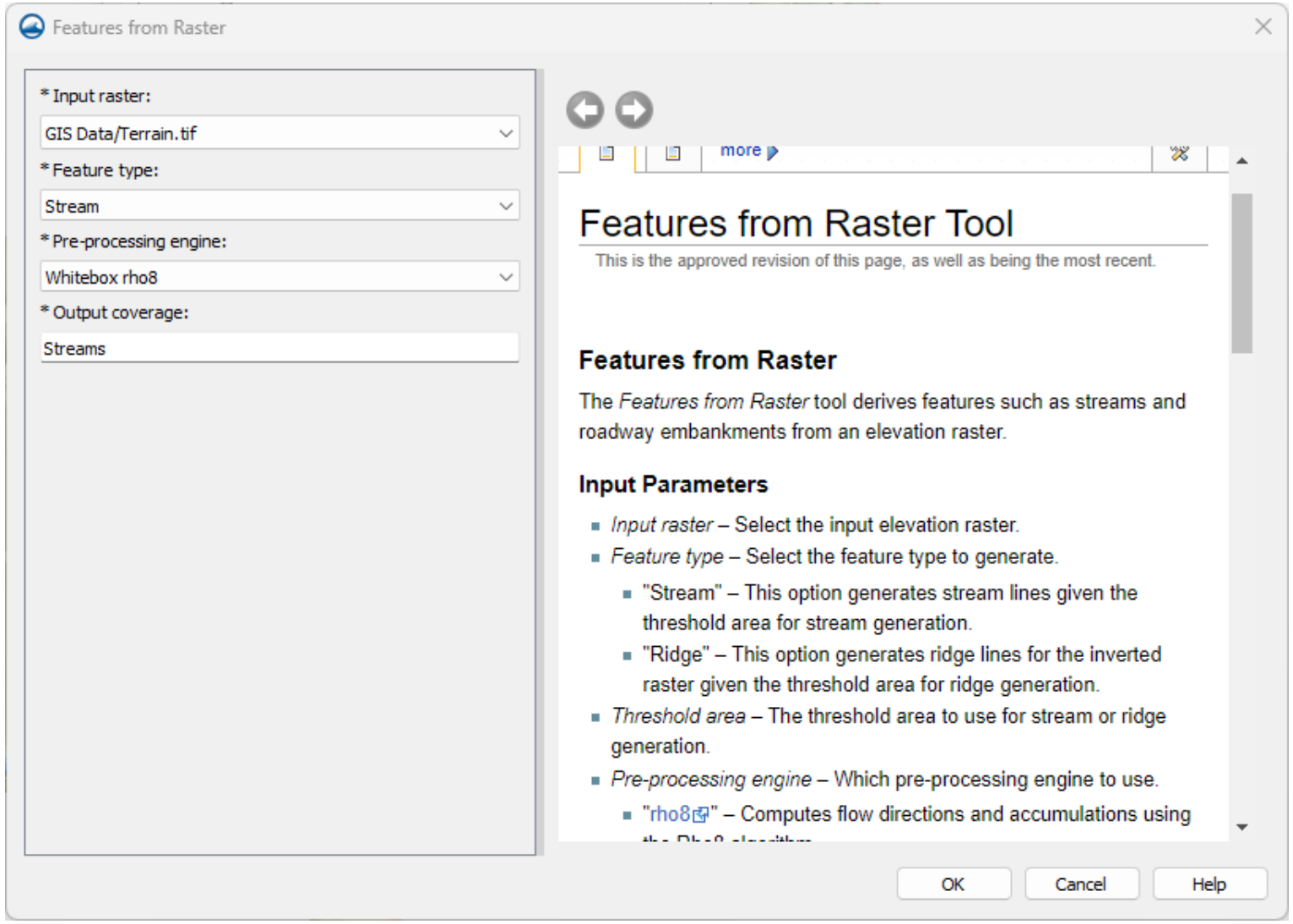


SMS 14 Feature Highlights

Feature Extraction Improvements

Auto-generate breaklines for streams and ridges

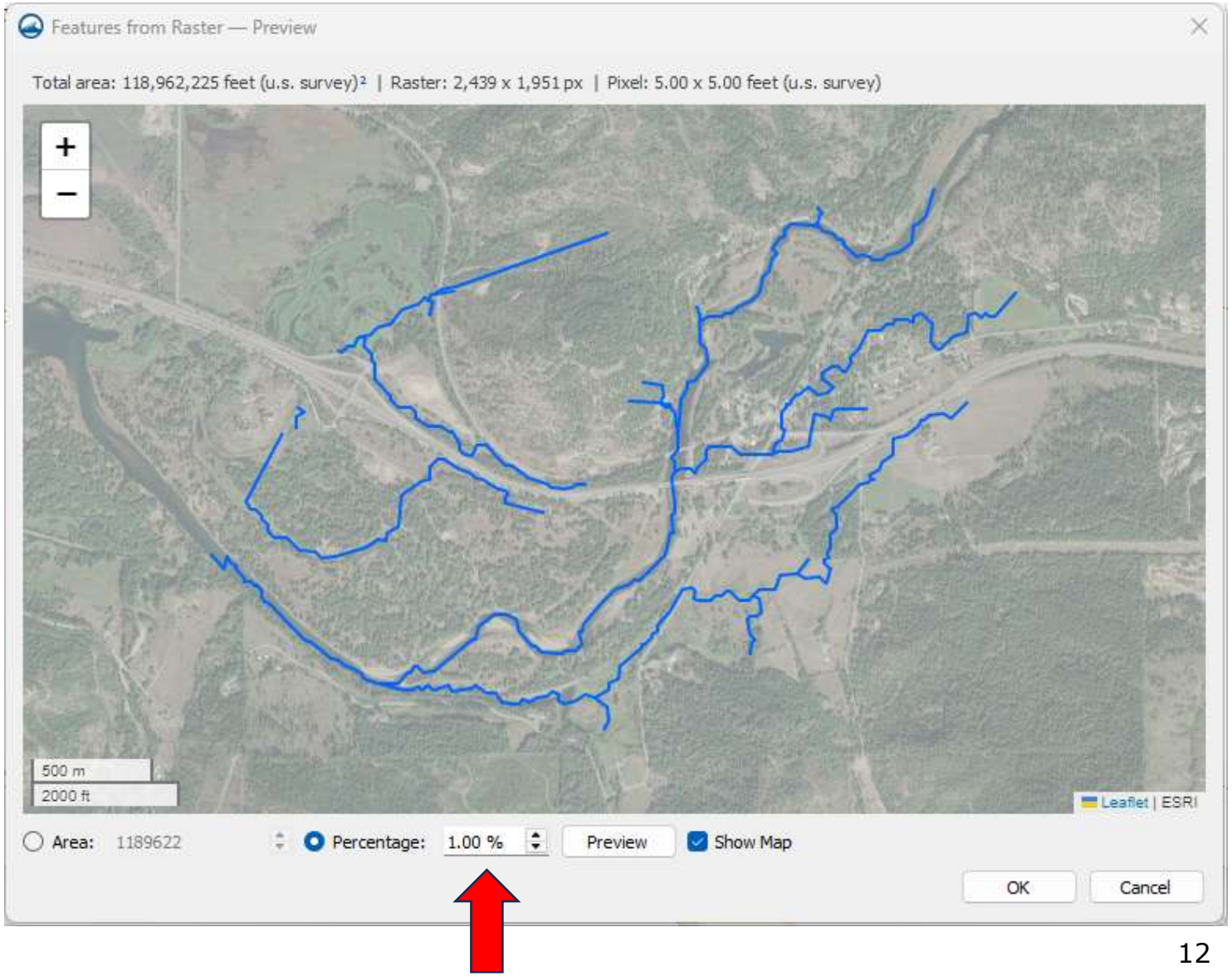
- From Toolbox, run Features from Raster
- Select Input Raster
- Set Feature Type (Stream or Ridge)
- Name output coverage
- Run (OK)



SMS 14 Feature Highlights

Feature Extraction Improvements

- In the Preview window change the % or area or area and Preview
- Select OK when the desired density of breaklines is shown
- Repeat for Ridges (Use run tool from History option)



SMS 14 Feature Highlights

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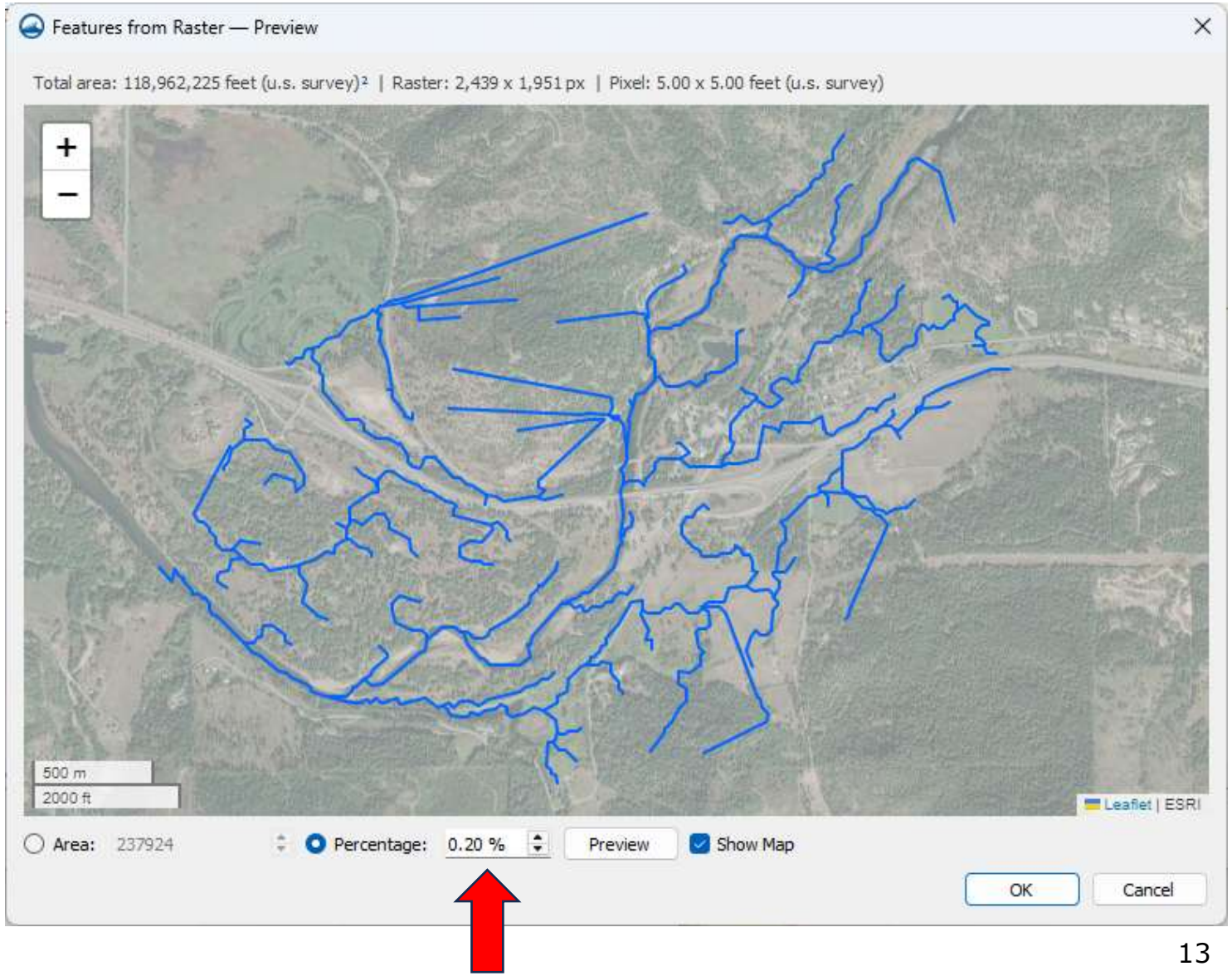
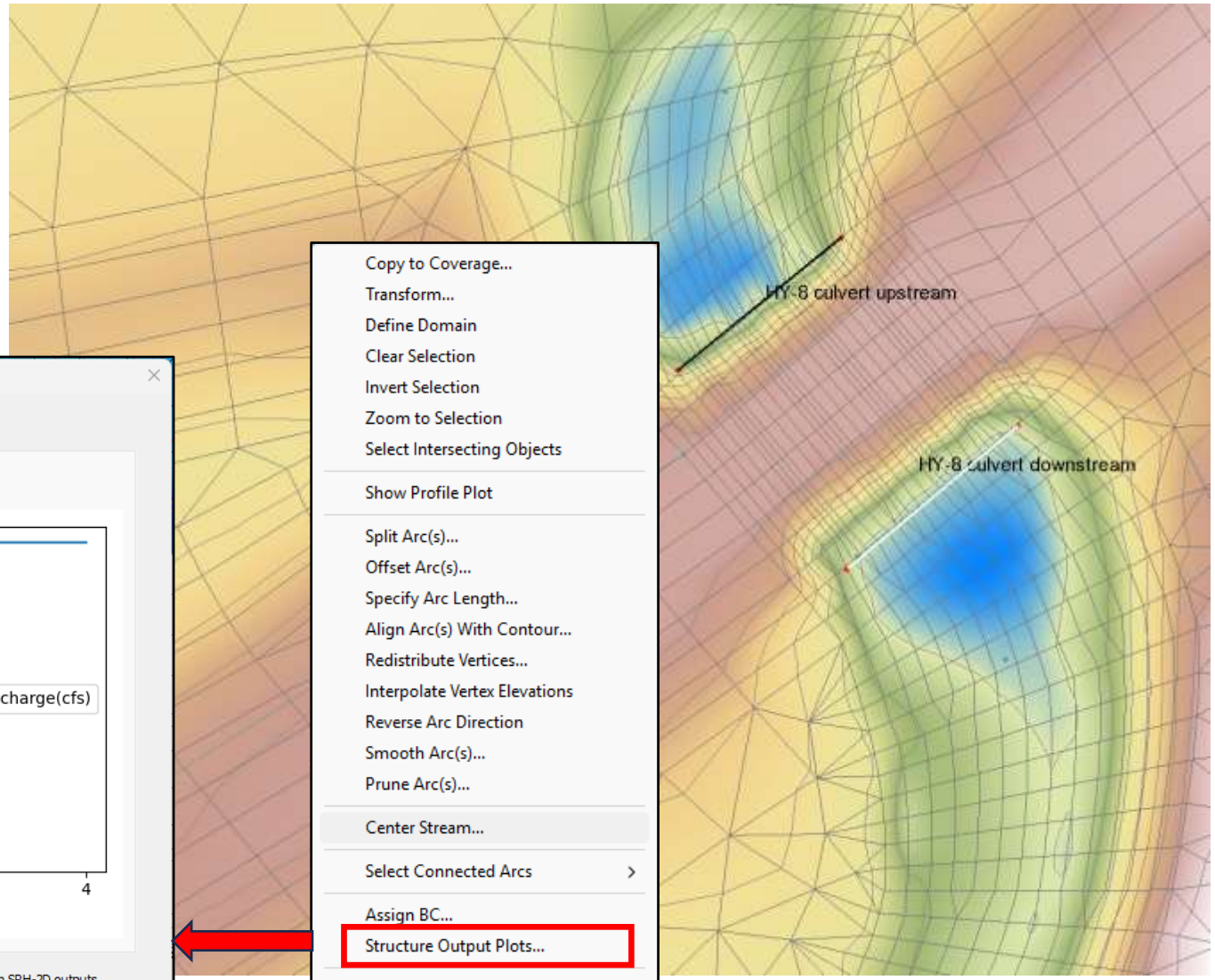
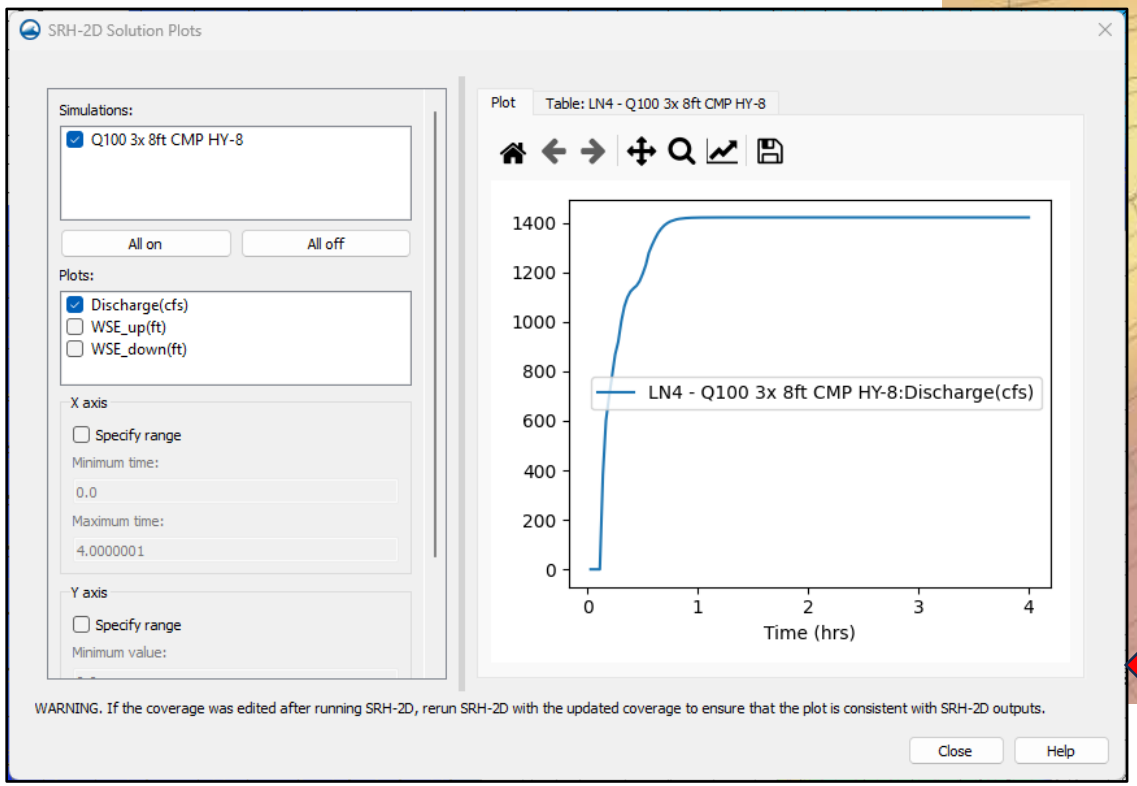


SMS 14 Feature Highlights

Hydraulic Structure Summaries – 1D Structures

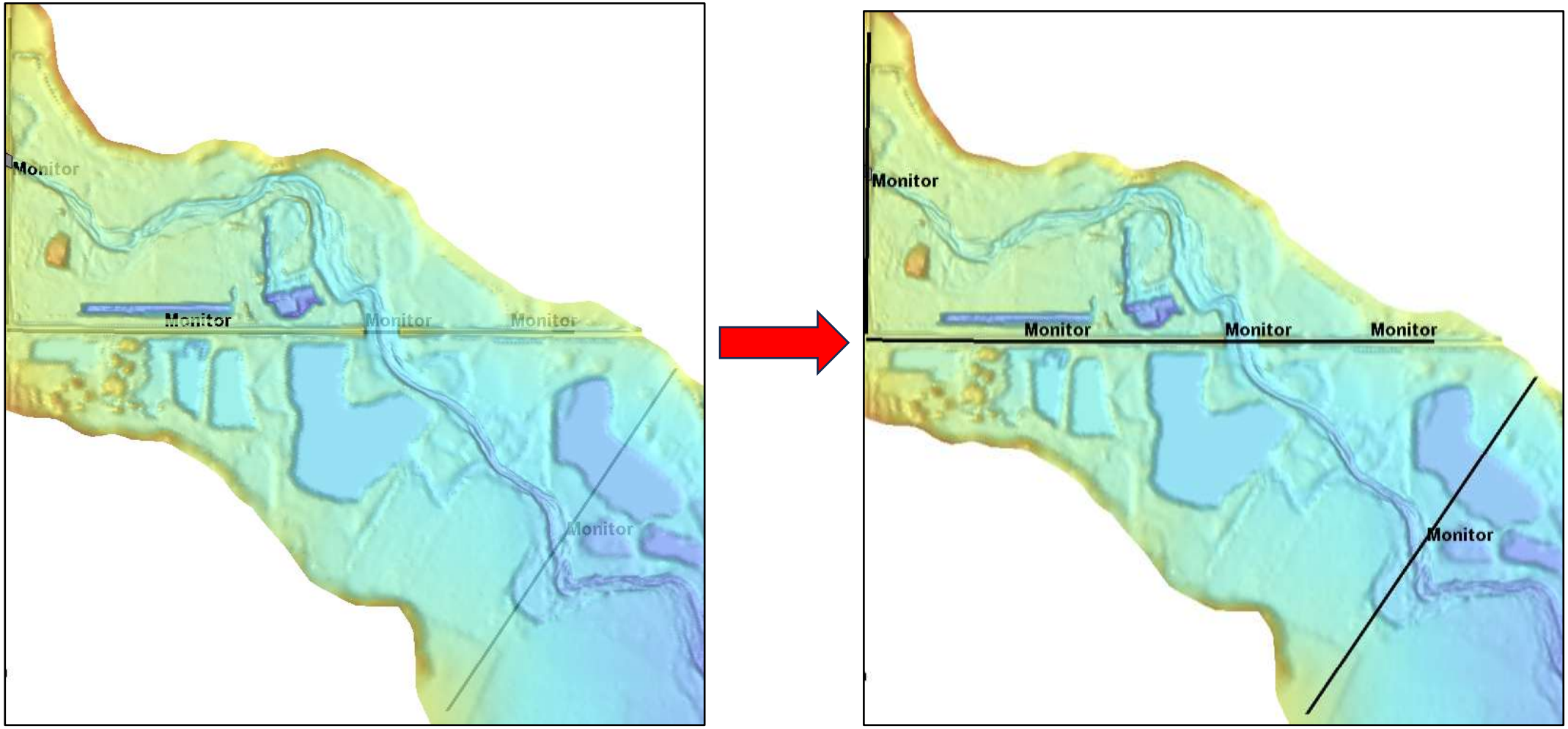
- Select one of the structure arcs
- Rt Click → Structure Output Plots





SMS 14 Feature Highlights

Map Coverage Elevation Overrides

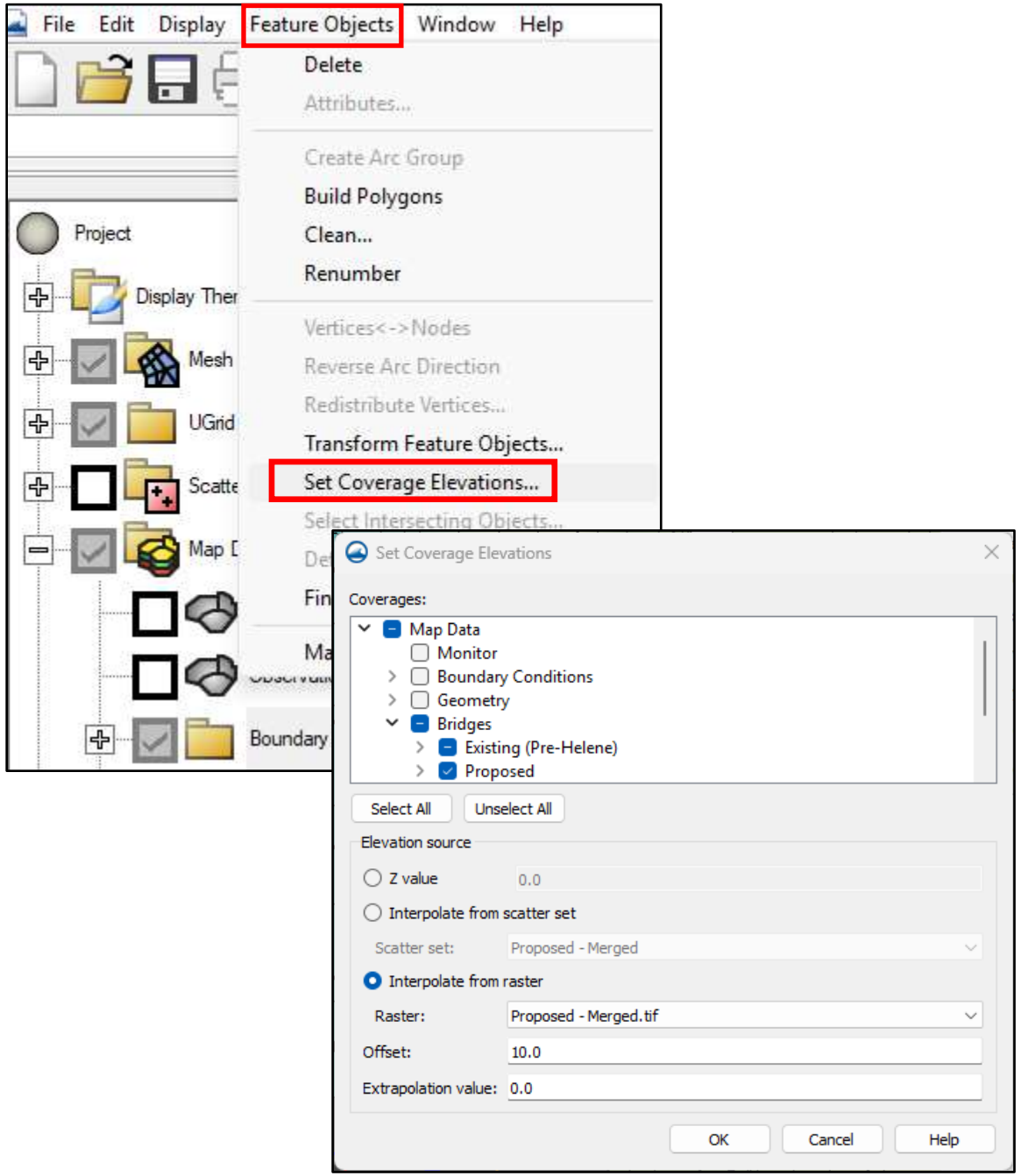


SMS 14 Feature Highlights

Map Coverage Elevation Overrides

With a map coverage active

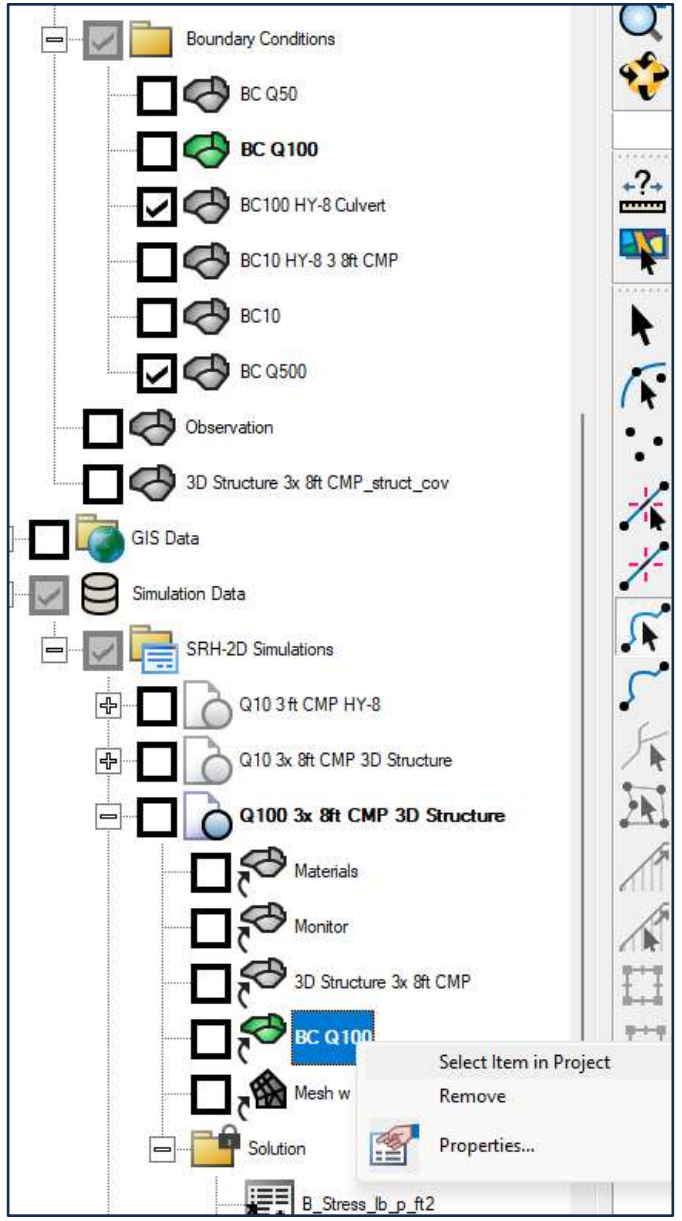
- Feature Objects → Set Coverage Elevations
- *Or* Rt Click on a coverage → Set Coverage Elevations
- Set Coverage Properties
  - Select coverages
  - Select elevation source



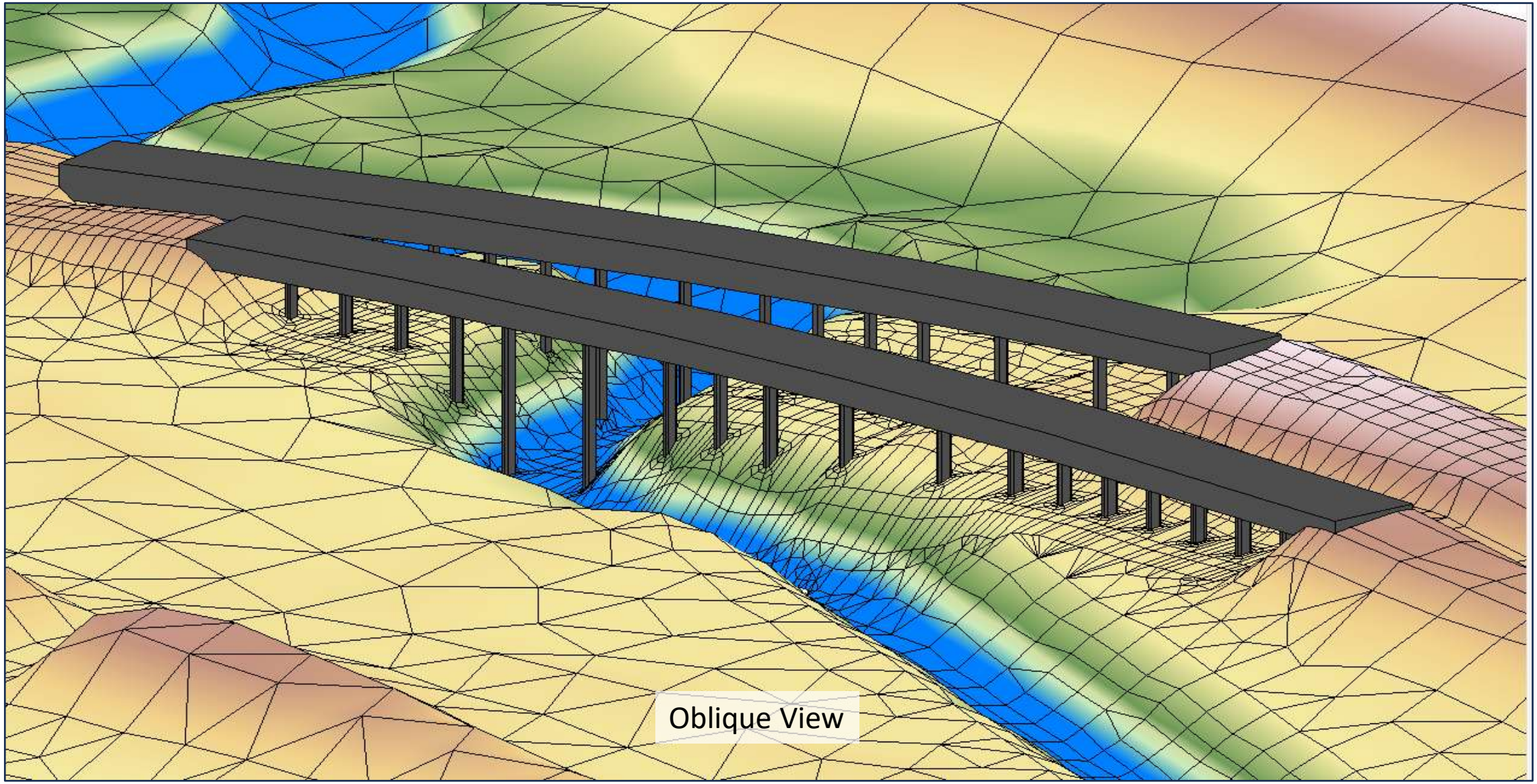
SMS 14 Feature Highlights

Select Item in Project Explorer

- Rt click on item in a simulation
- → Select Item in Project
- SMS jumps to that item and makes it active



3D Structures – Bridges and Culverts



Define 3D Structure – Center Line and Profile Curves

Edit 3D Structure

Profiles

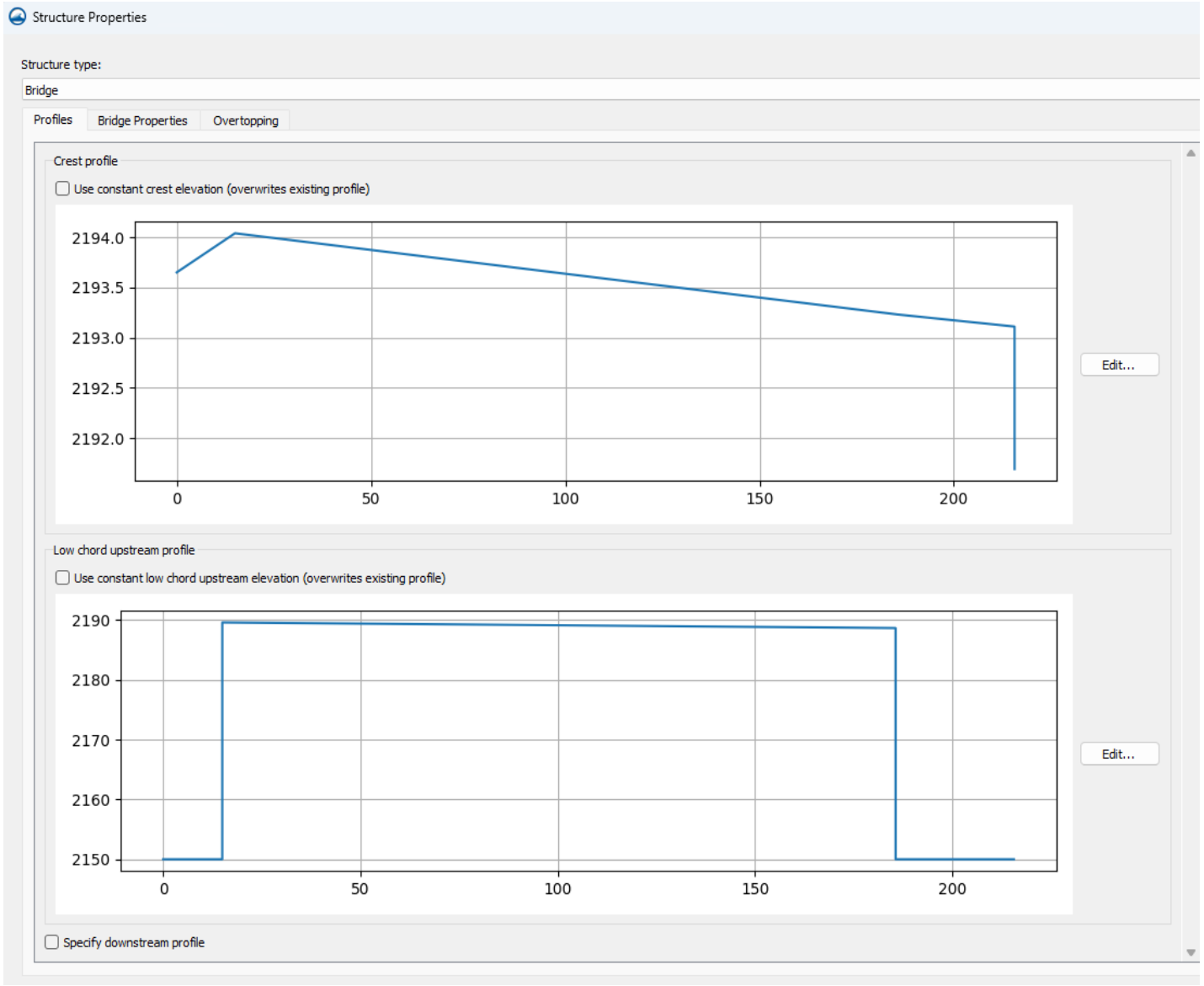
- Vertical walls may be used in low chord profile

IF

- At least 3 elements are used through the bridge

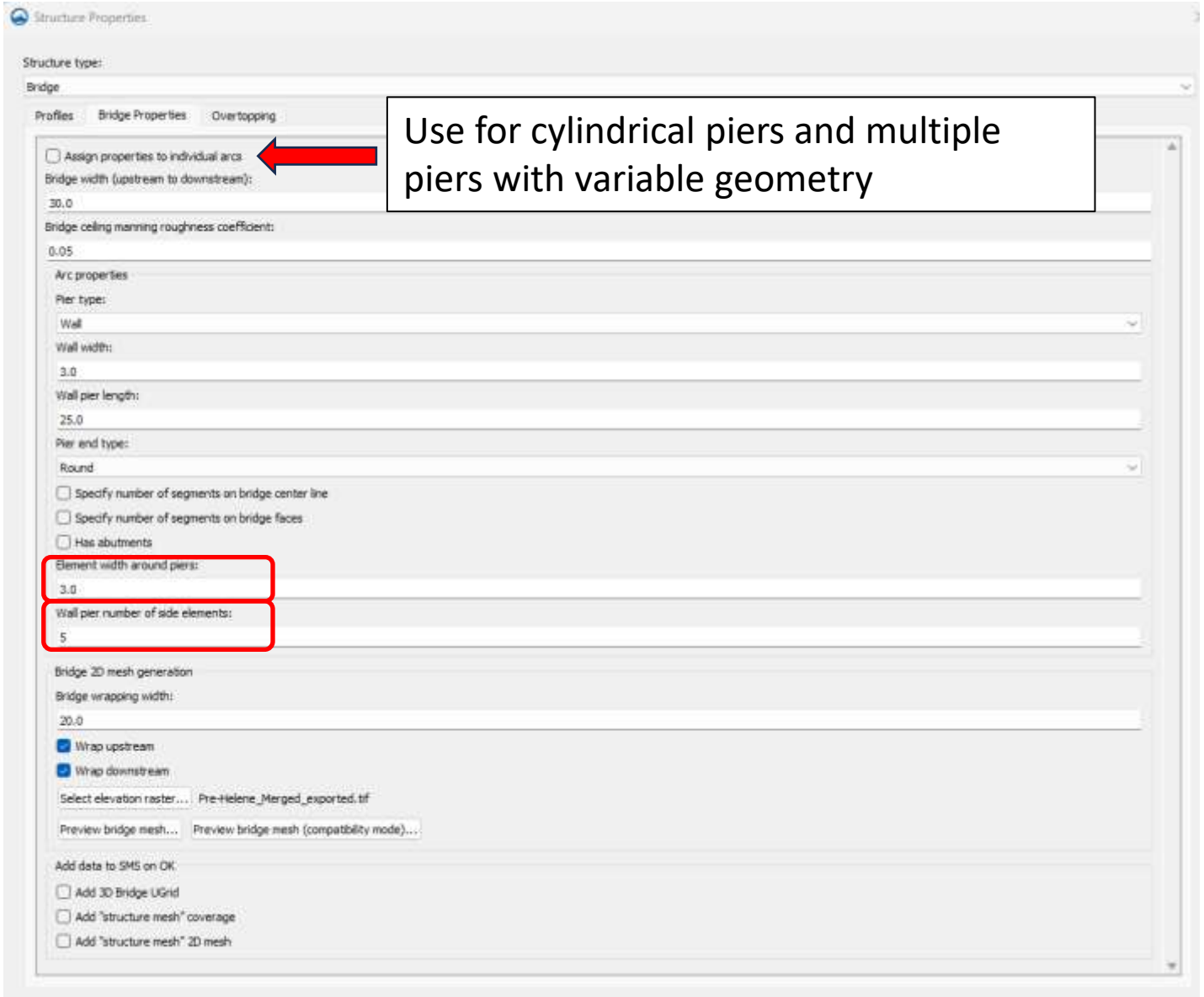
THEN

- Voids in the mesh are not needed to represent vertical abutments



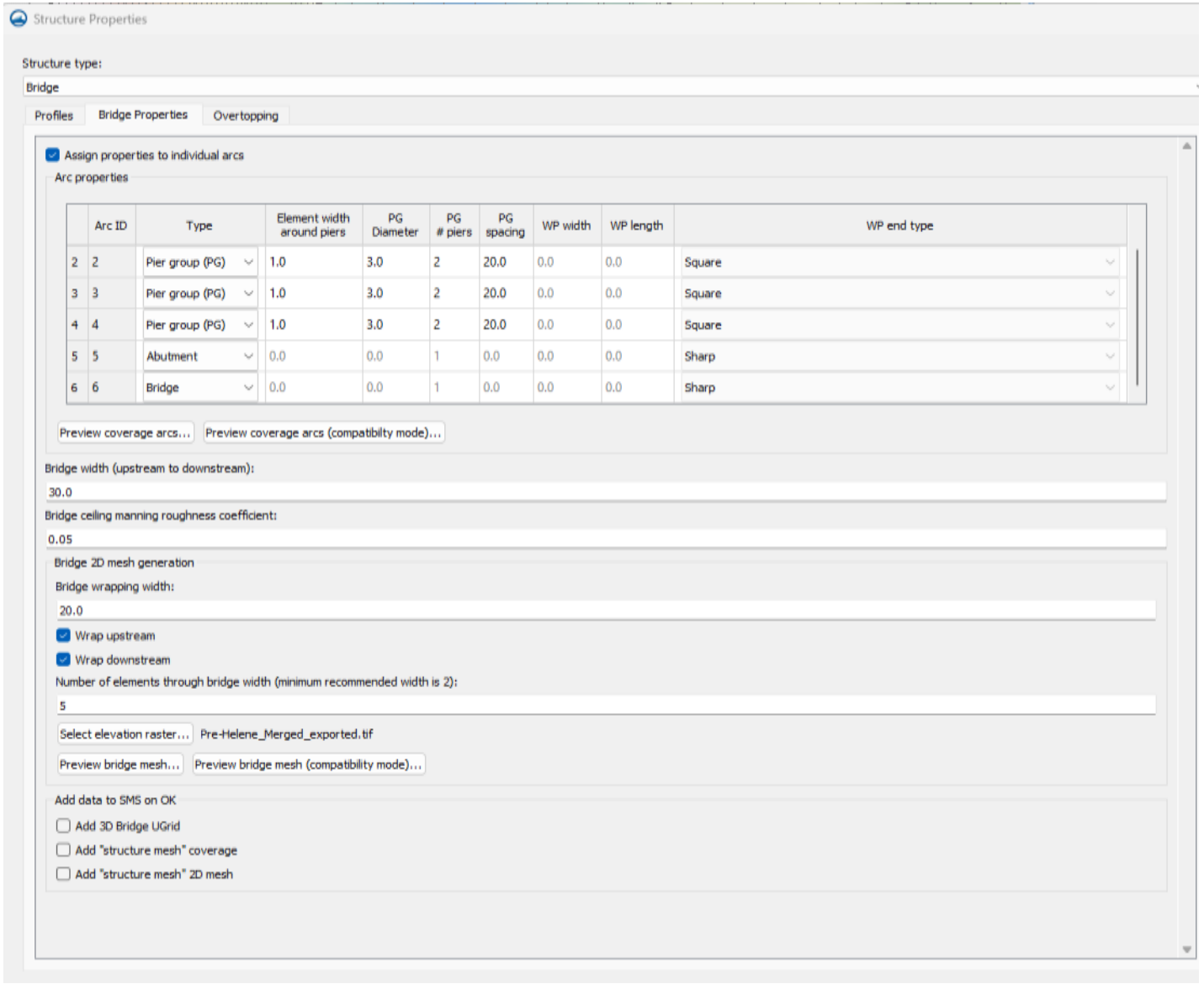
3D Structure – Bridge Properties

- Use 0.05 for default Manning's ceiling roughness for girder bridges (SMS 13.4 and up)
- Element width around piers – 1 pier width recommended
- Number of side elements
  - Minimum of 3
  - 5 or more recommended for scour analysis



Mesh Generated in the "Footprint" of the Bridge

- Assign properties to individual arcs
  - Best for pier groups
  - Piers with differing sizes and characteristics
  - Allows number of elements through bridge to be specified
- Preview bridge mesh
  - Some iterations may be needed with mesh / pier / bridge geometry
  - Mesh quality improvements still in progress



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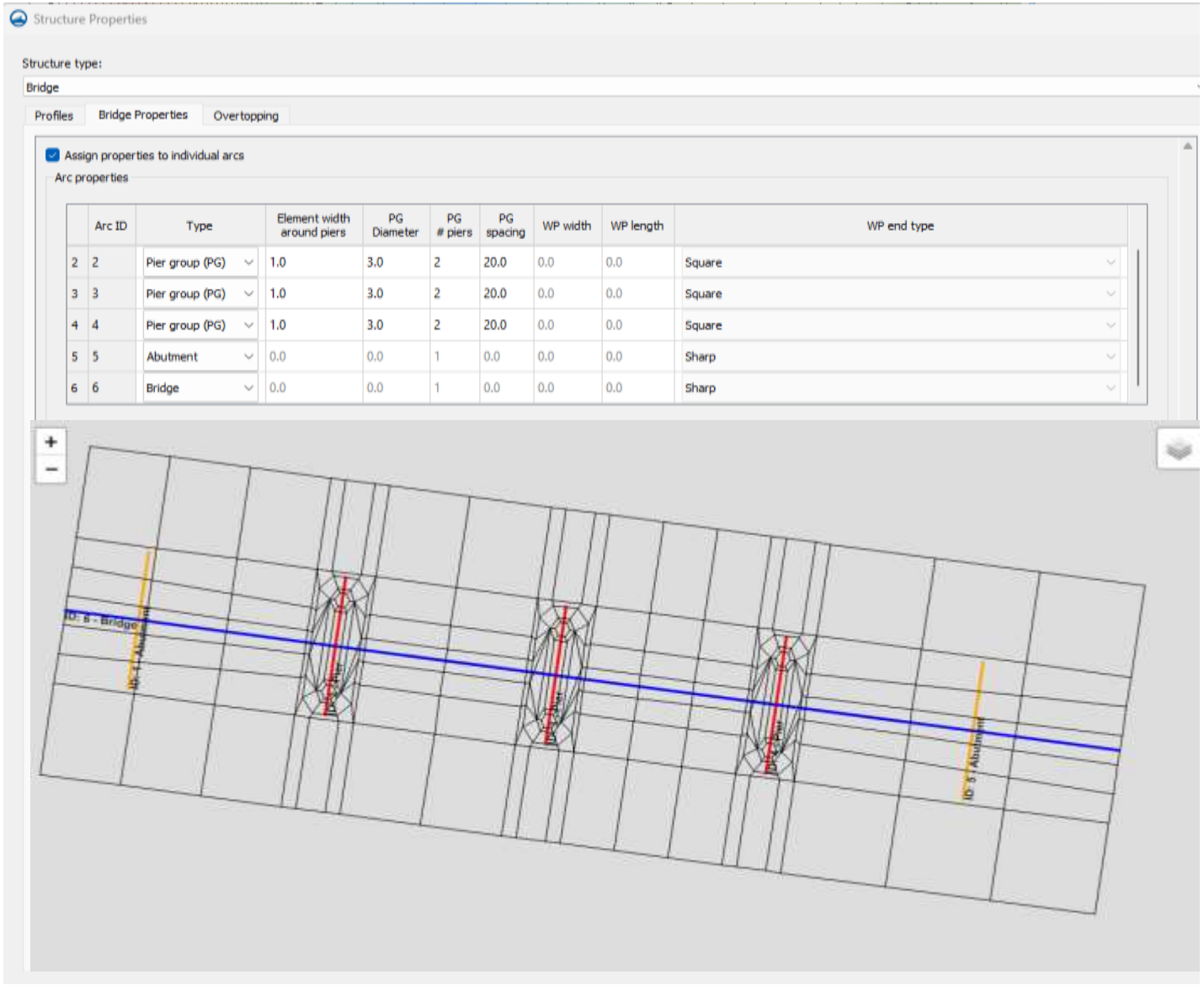
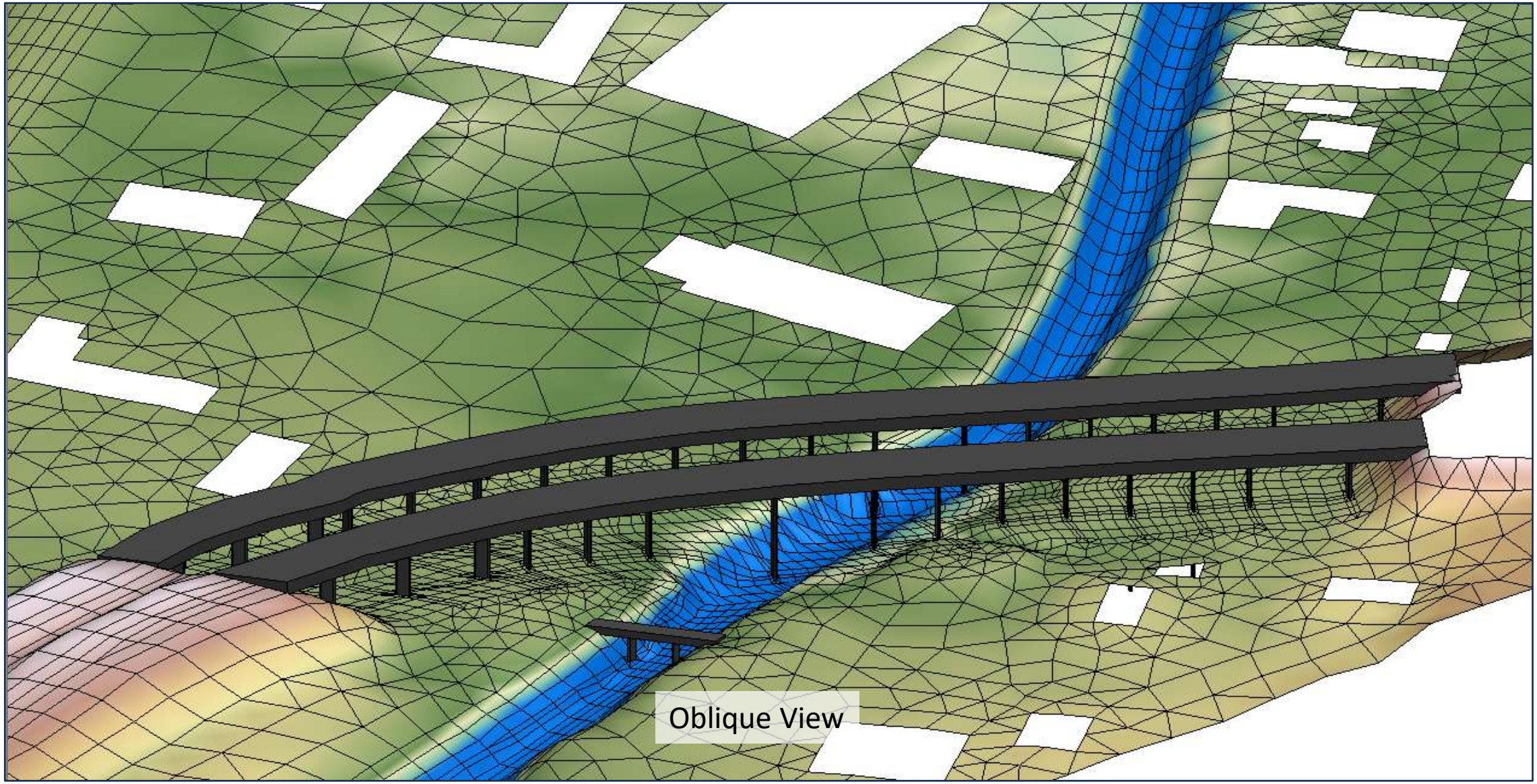
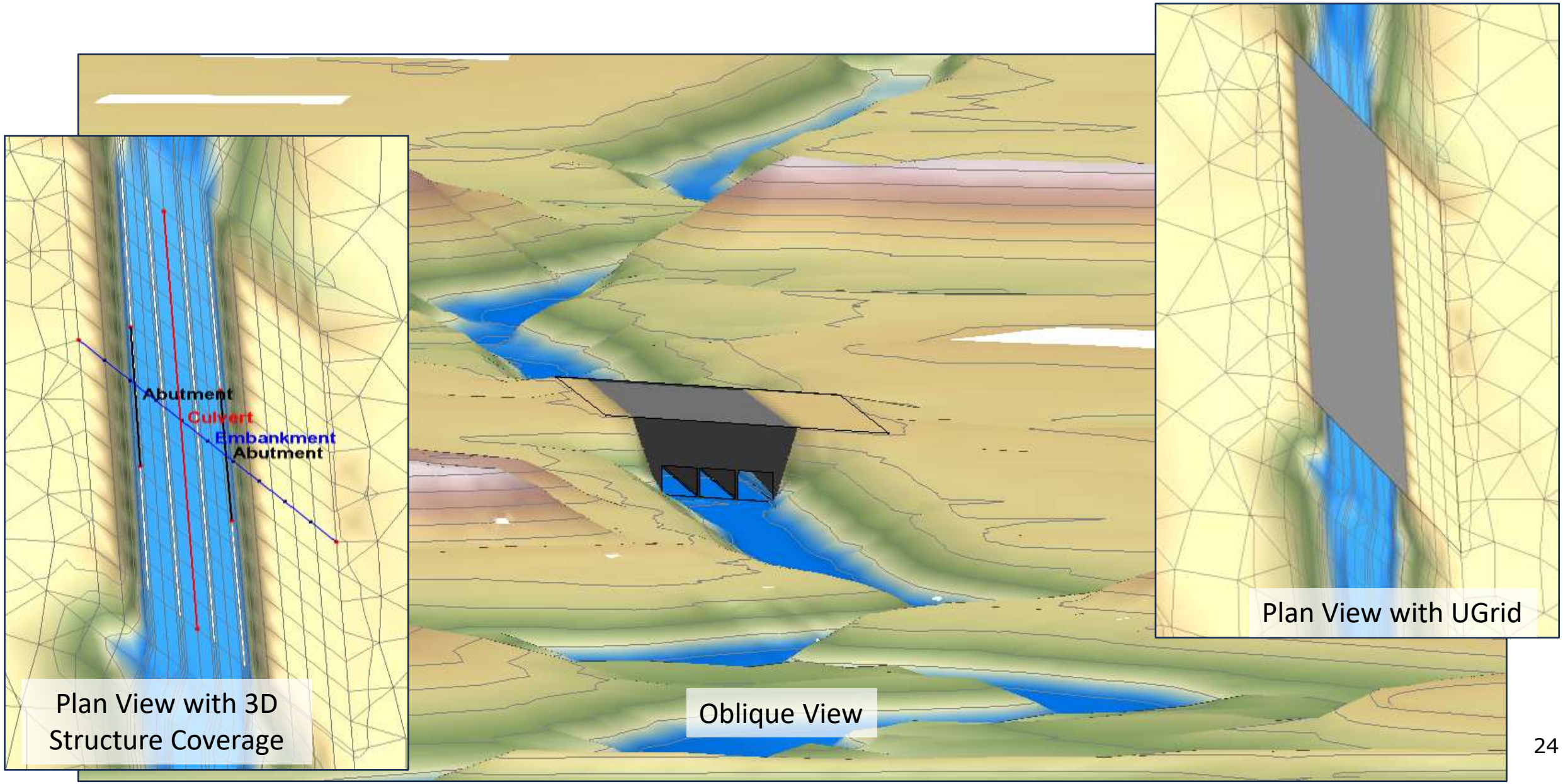


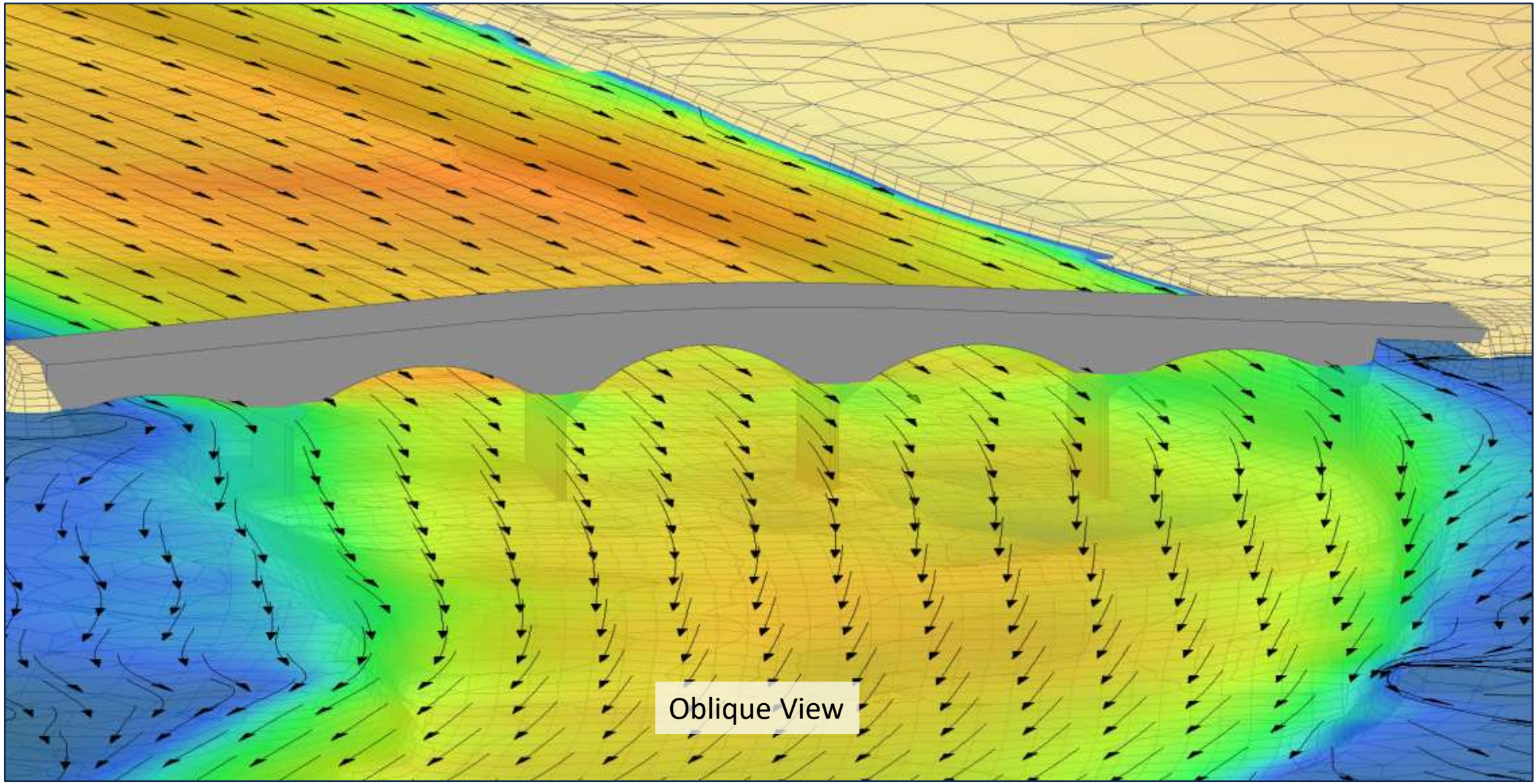
3D Structure Example: Curved Bridge



3D Stucture Example: Skewed, Multiple Barrel Culvert

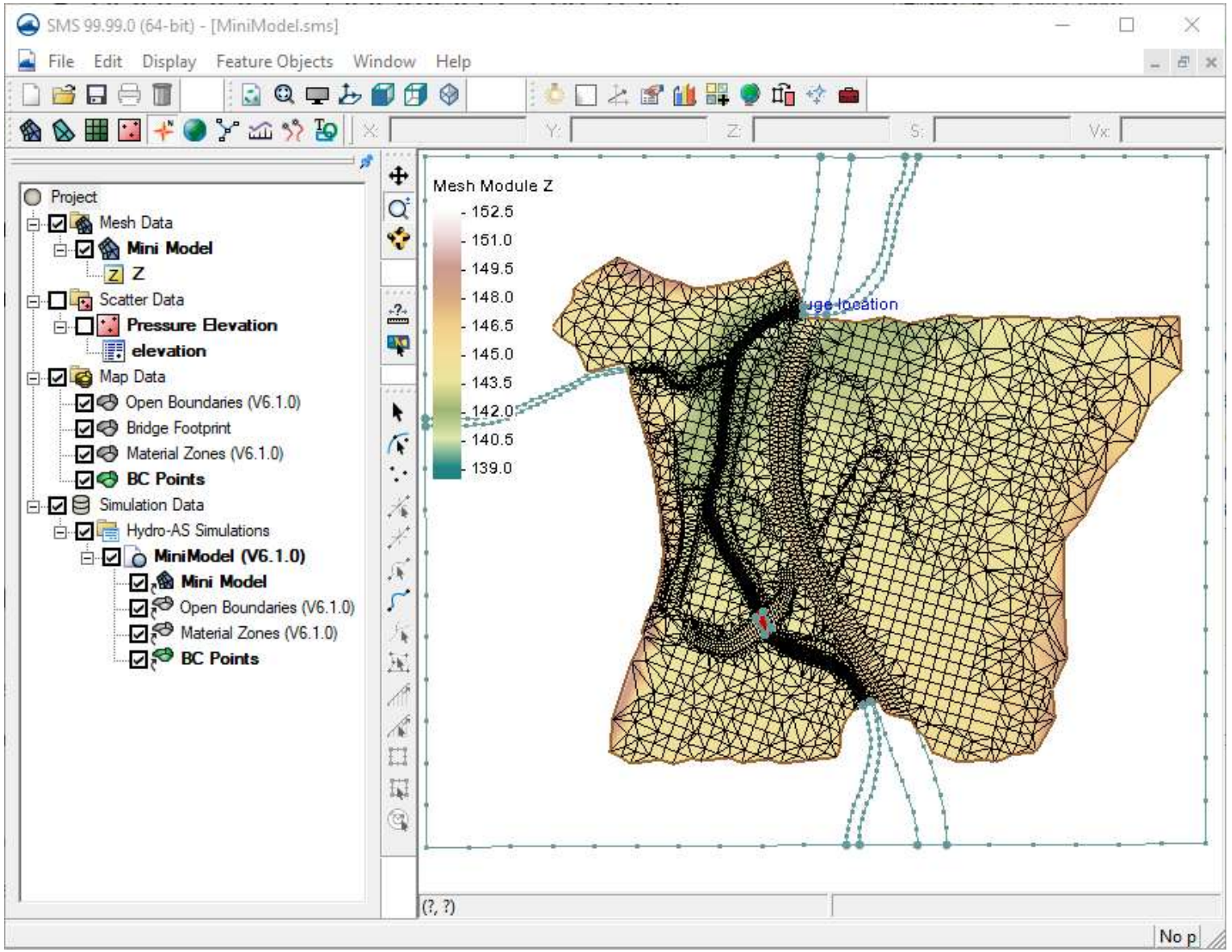


3D Structure Example: Multple Arched Bridge



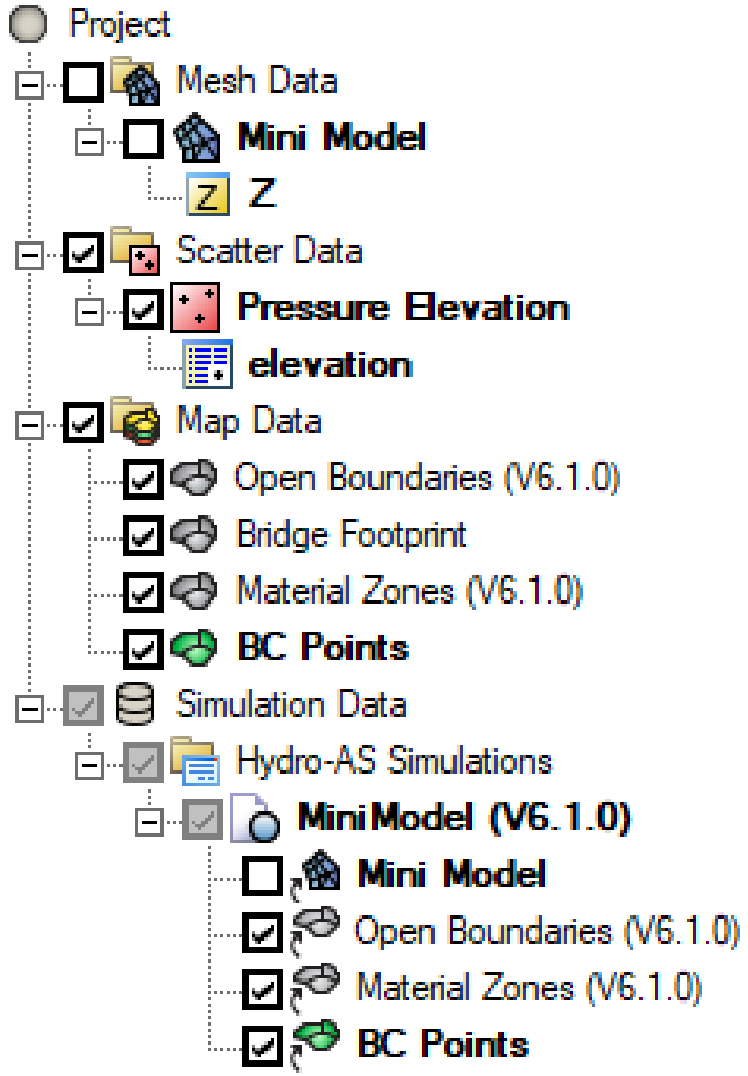
Simulation based modeling with Hydro_AS

- Native File Support
- Simulation Management
- Custom Tools
- Updates on Mesh Generation



Simulation Based Modeling

- Component Based
  - Mesh
  - Boundary Condition Coverage
  - Materials Coverage
  - Simulation Entity
    - Model Parameters
- Reusable
- Flexibility



Native File Support

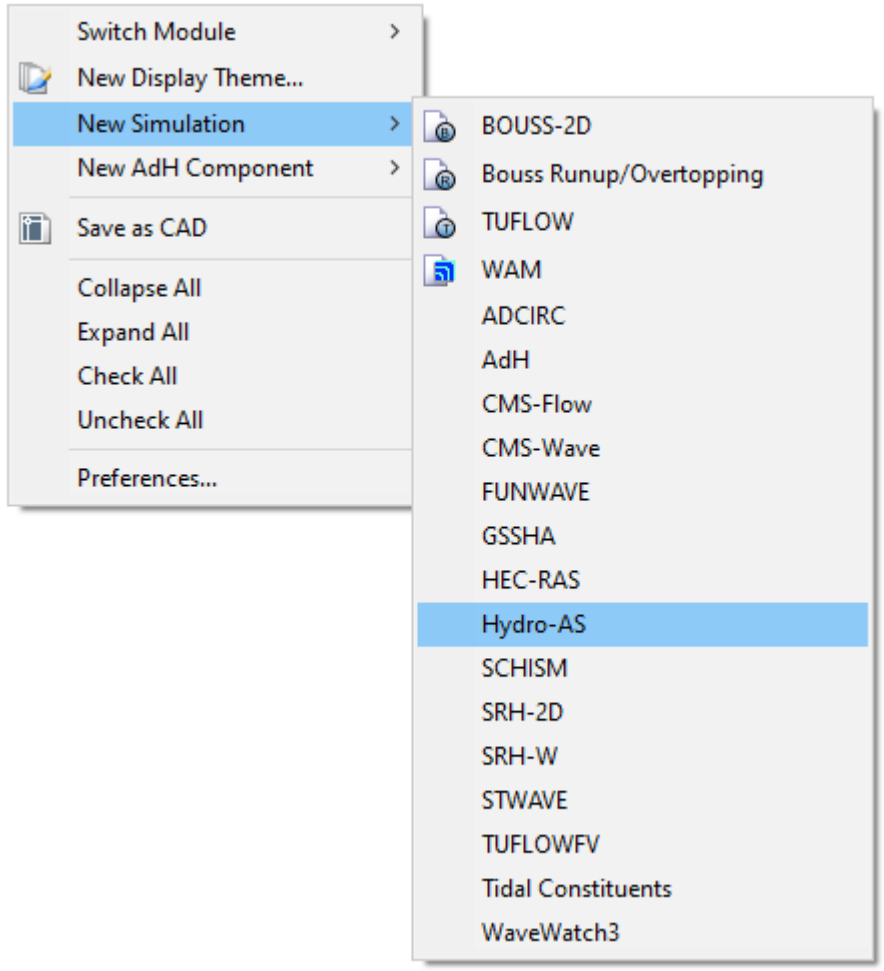
- .2dm File
  - Geometry
  - HydroAS Version
- Reading / Import
  - Simulation
  - Mesh
  - Line Boundaries
  - Point Boundaries
  - Material Polygons / List
- Writing / Export

```
BEGPARAMDEF
GM  "HydroAS V6.1.0"
SI  1
DY  0
TU  "sec"
TD  0  0
GP 1 "HydroAS" 1
.
.
.
ENDPARAMDEF
```

```
MESH2D
MESHNAME "Mini Model"
NUM_MATERIALS_PER_ELEM 1
E3T 1 20 21 1 4
E4Q 2 1 2 22 20 1
E4Q 3 3 23 22 2 1
E4Q 4 3 4 24 23 1
E4Q 5 5 25 24 4 1
.
.
.
ND 1 4298771.59 5506787.54 143.073
ND 2 4298772.08 5506787.75 142.97701
ND 3 4298772.57 5506787.97 142.75101
ND 4 4298773.02 5506788.25 142.701
ND 5 4298773.47 5506788.54 142.651
ND 6 4298773.92 5506788.83 142.629
.
.
.
NS 5351 5249 5142 5035 4924 4810 4676 4539 4411 -4288 1
NS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 -19 2
```

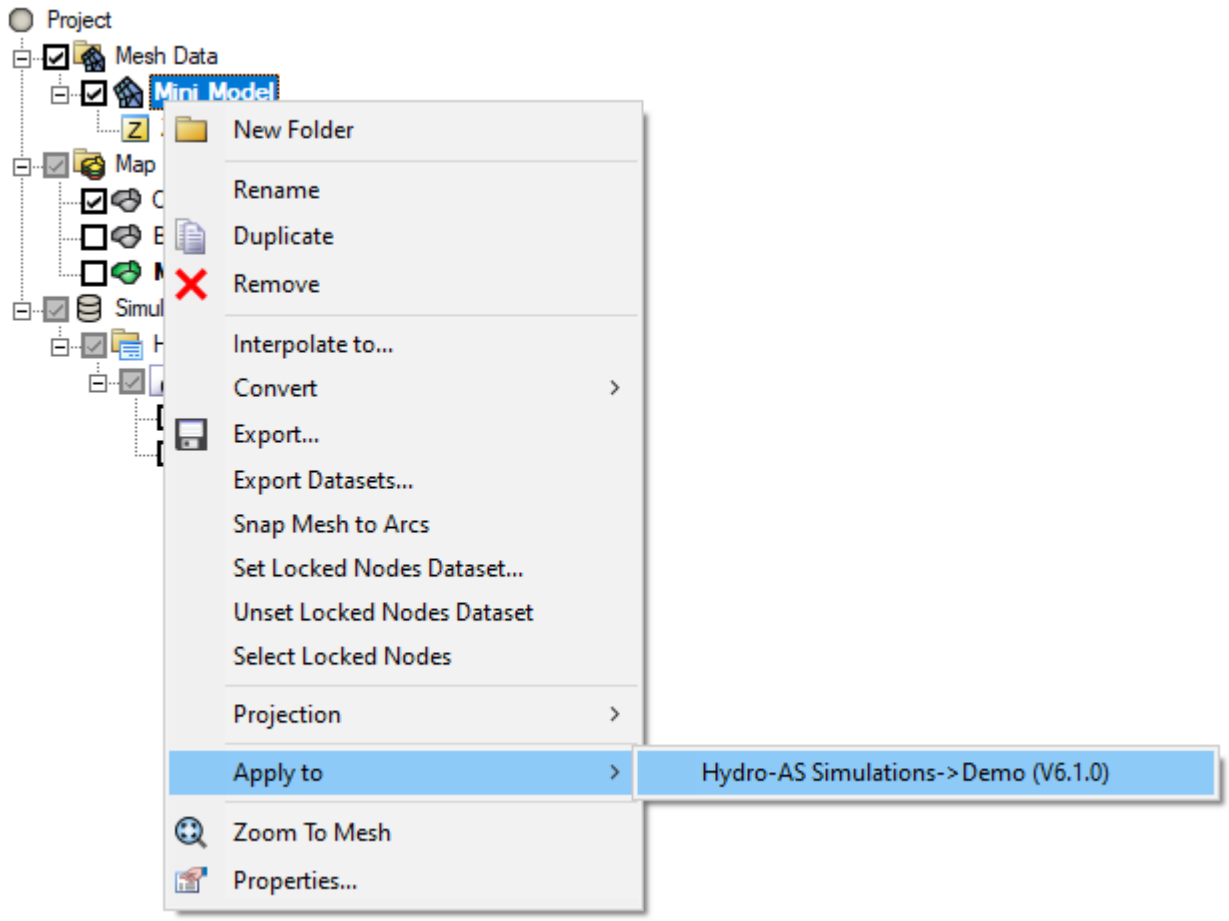
Simulation Creation

- Right click in Project Explorer
- Select “Template”
  - Determines HydroAS version
- Set simulation name



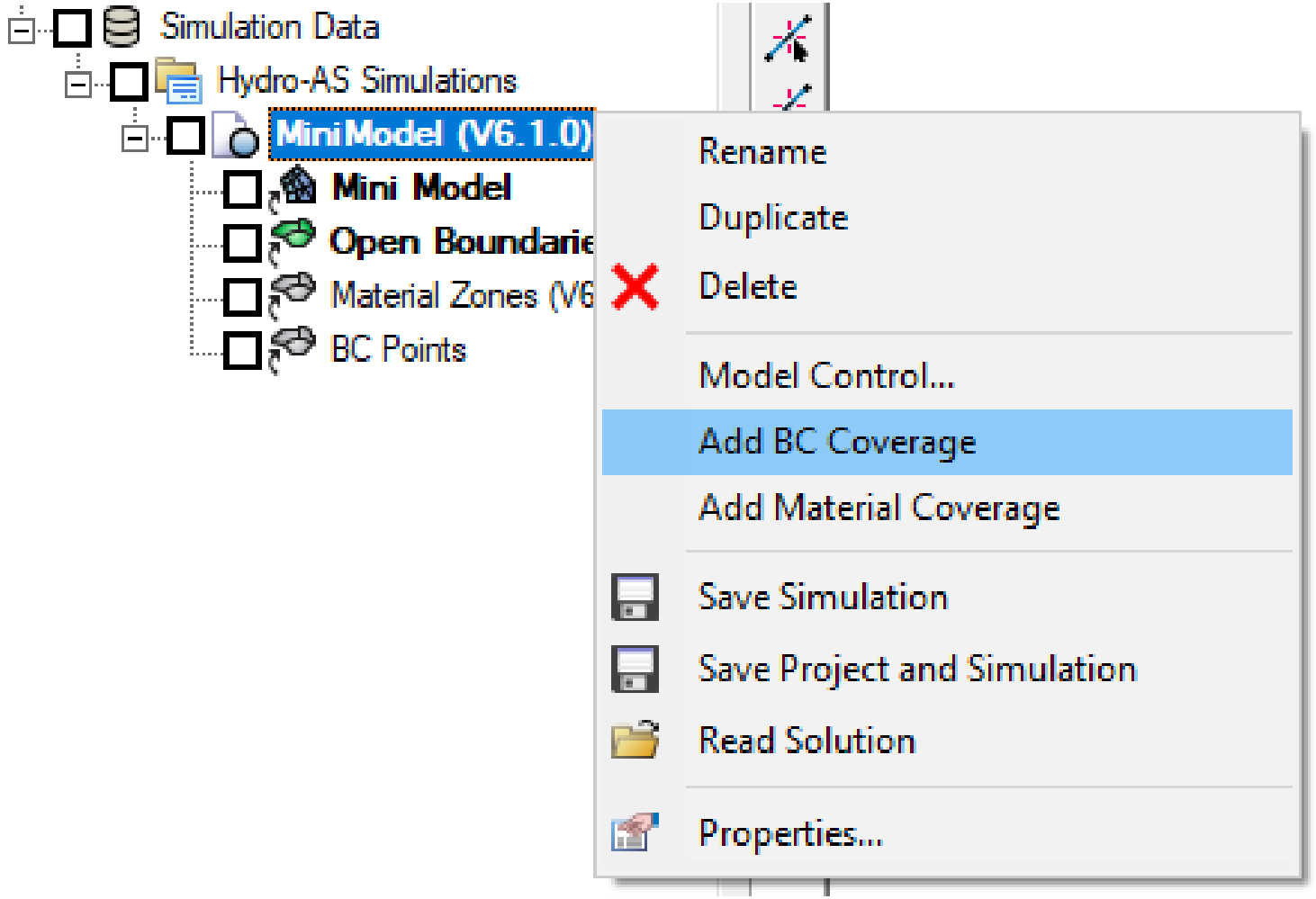
Simulation Management

- Apply Components
  - Drag / Drop
  - Right click - Apply
- Includes
  - Mesh
  - BC Coverage
  - Material Coverage



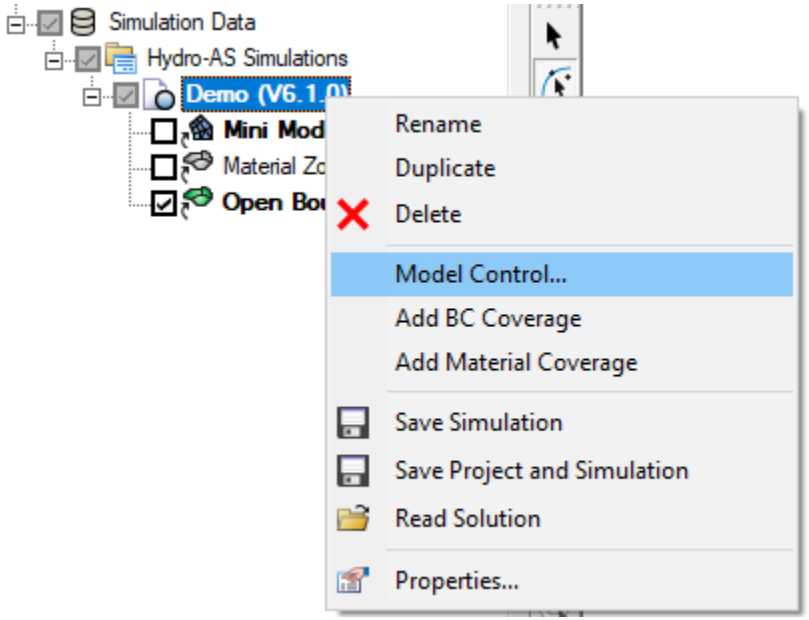
HydroAS Version Specification

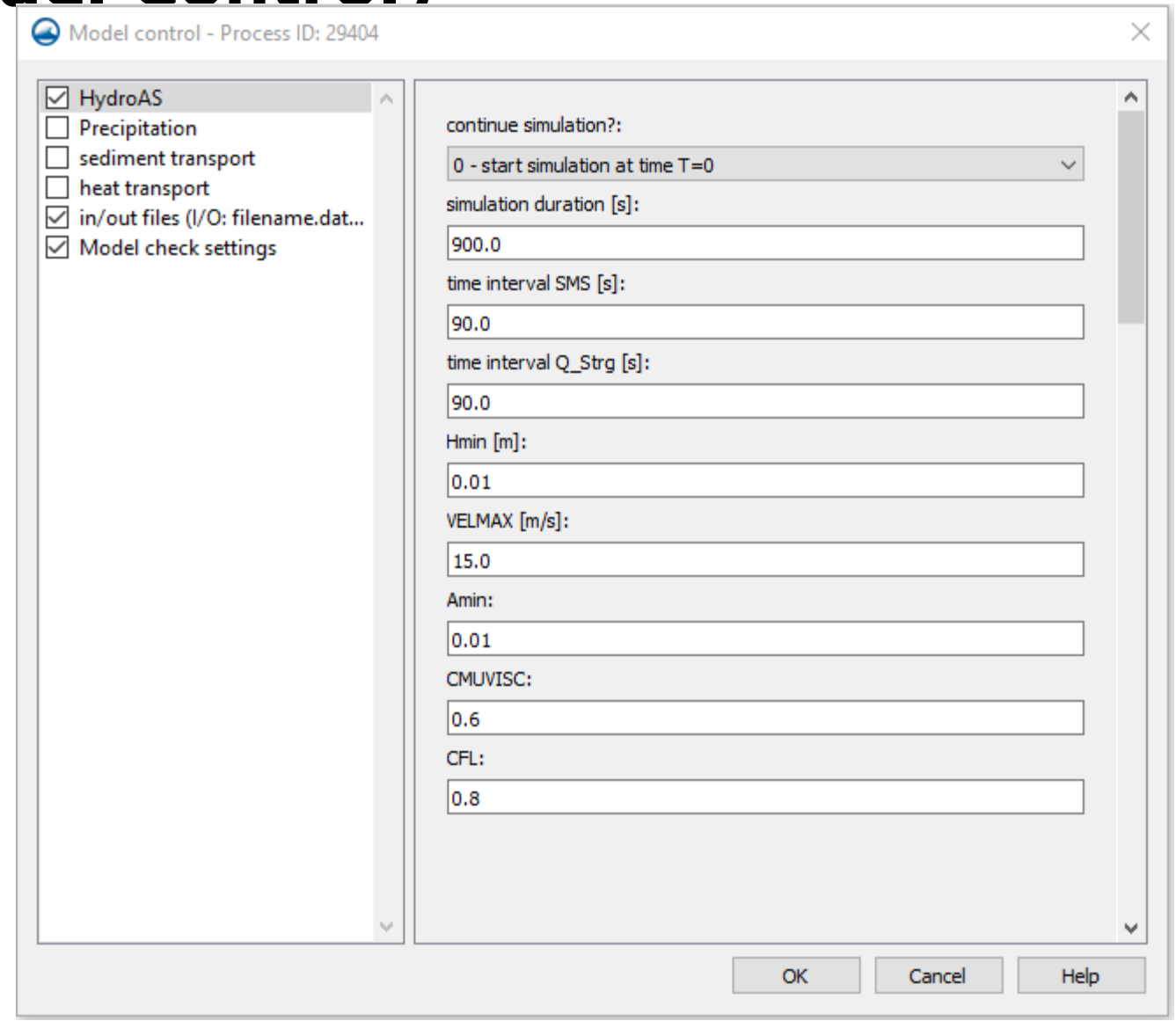
- Specified when:
  - Creating simulation
  - Creating coverage
  - Setting coverage type
- Copied when:
  - Copying simulation
  - Copying coverage
- Simulation Commands



Simulation Attributes (Model Control)

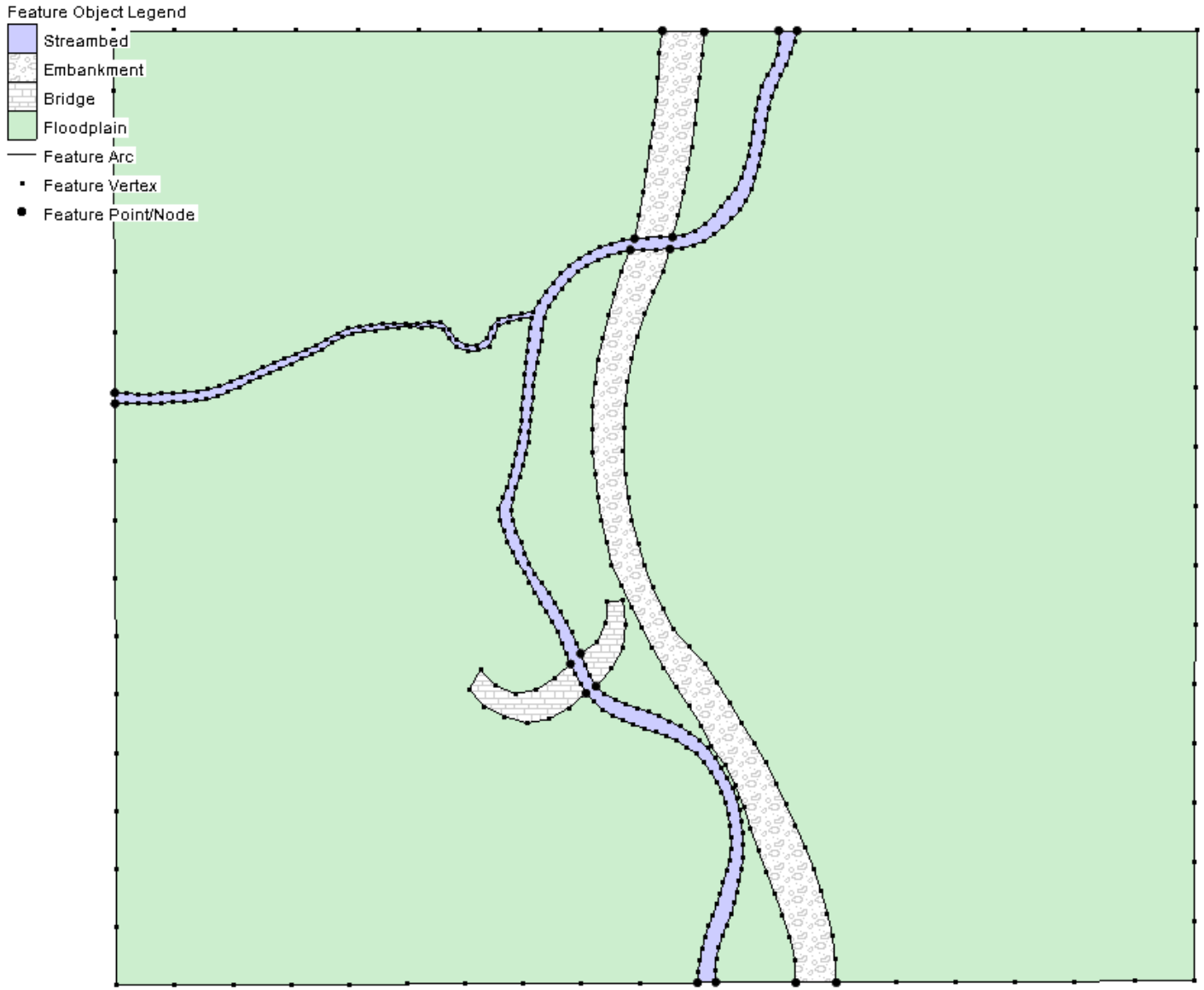
- Access with right click





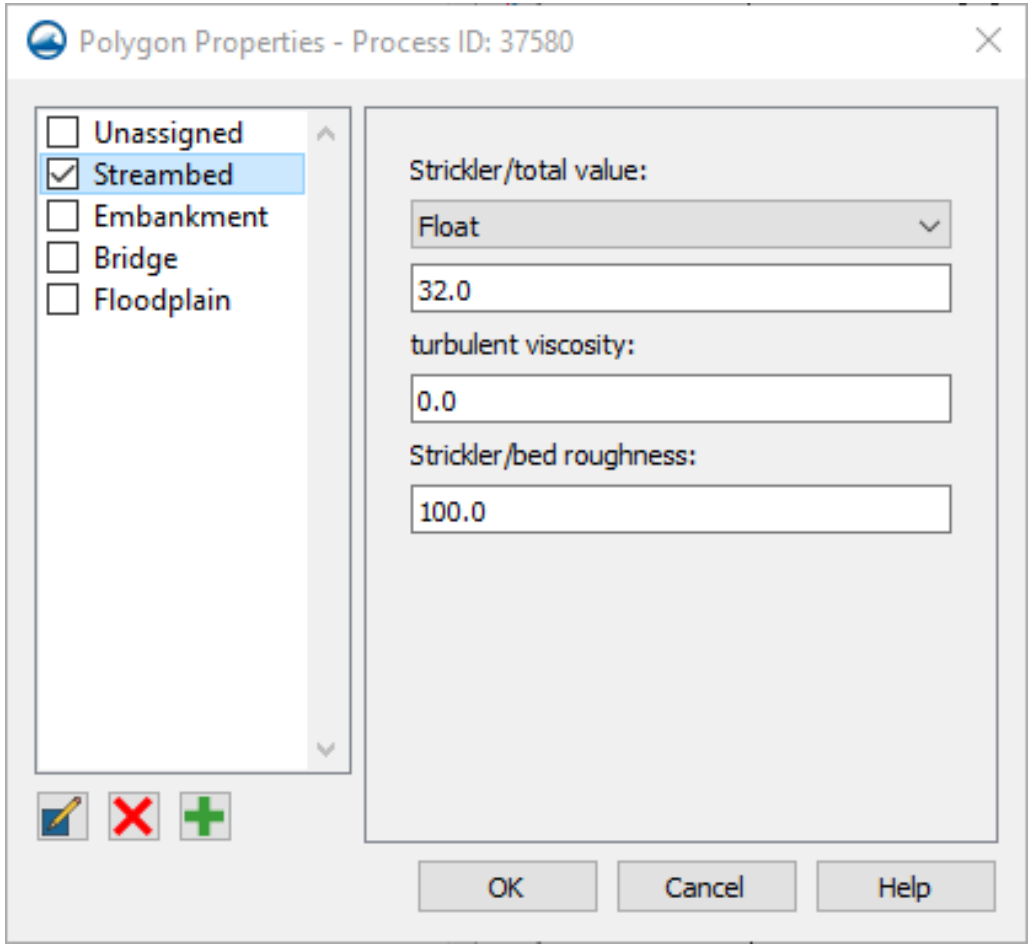
HydroAS Material Coverage

- Version Specific
- Material List / Attributes
- Display Options
- Applied to Simulation
  - Assigned to elements



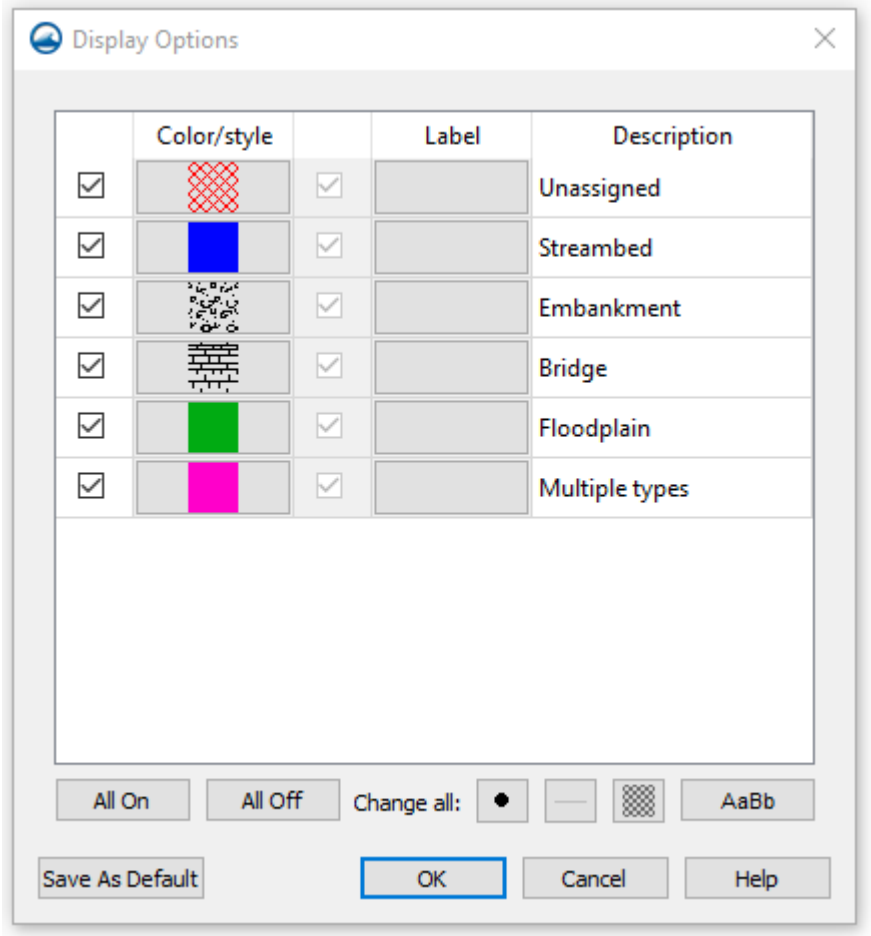
HydroAS Material List

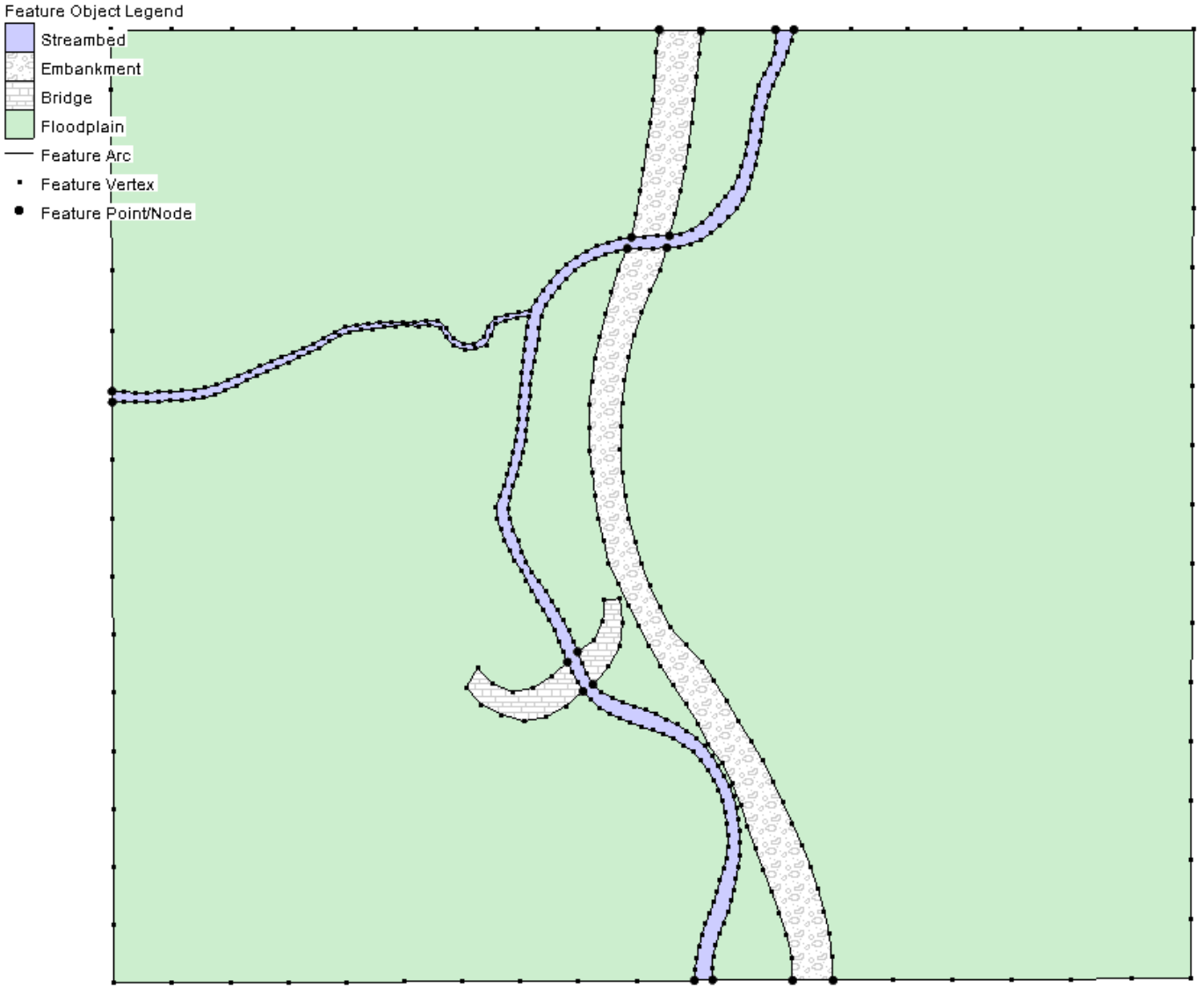
- Add / Delete materials
- Specify names
- Attributes
  - Strickler /total value
    - Constant
    - Depth Varied
  - Viscosity
  - Strickler /bed roughness
- Assign material type to polygon(s)



HydroAS Material Display Attributes

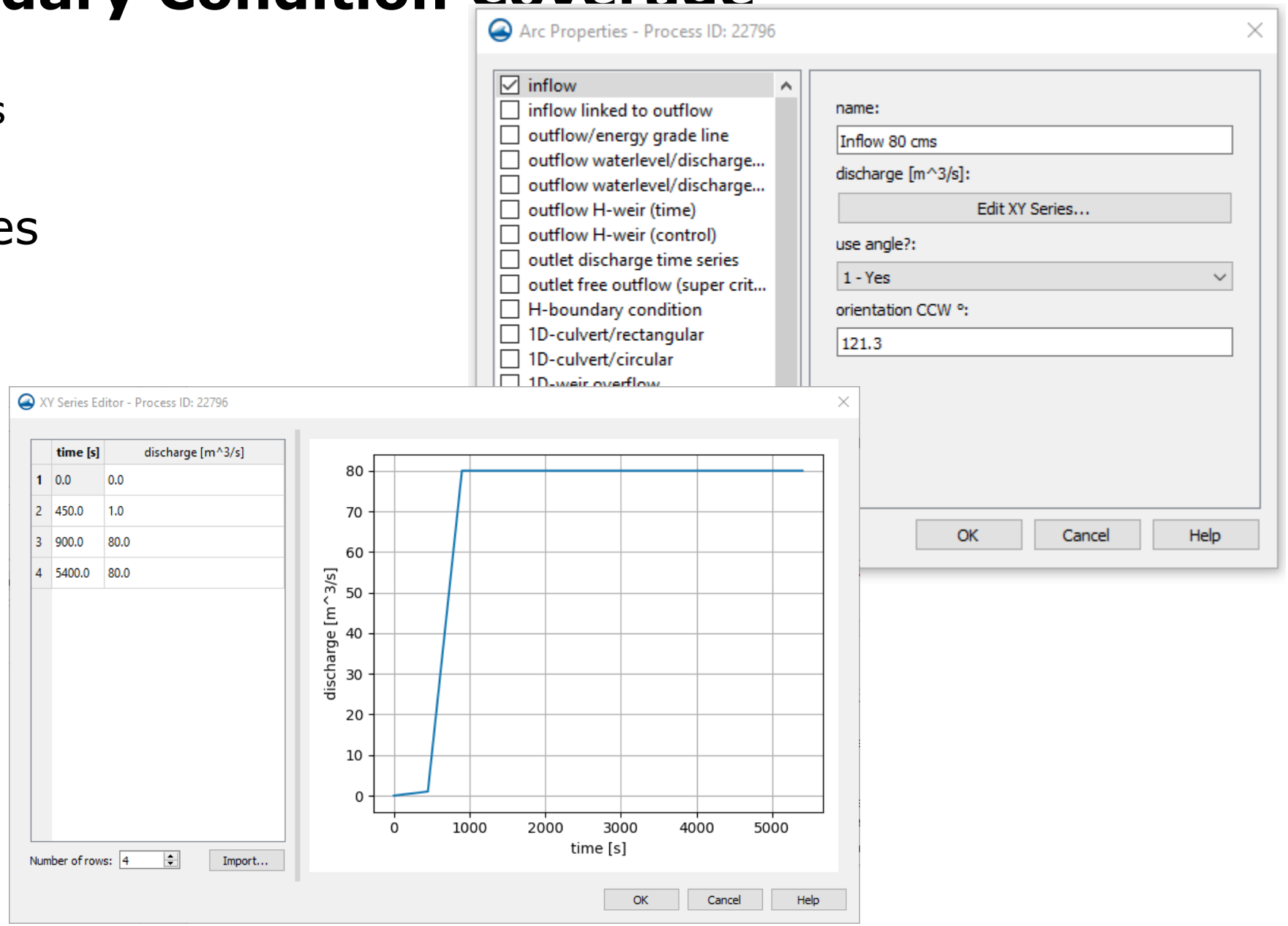
- Color / Style / Label for each material in the list





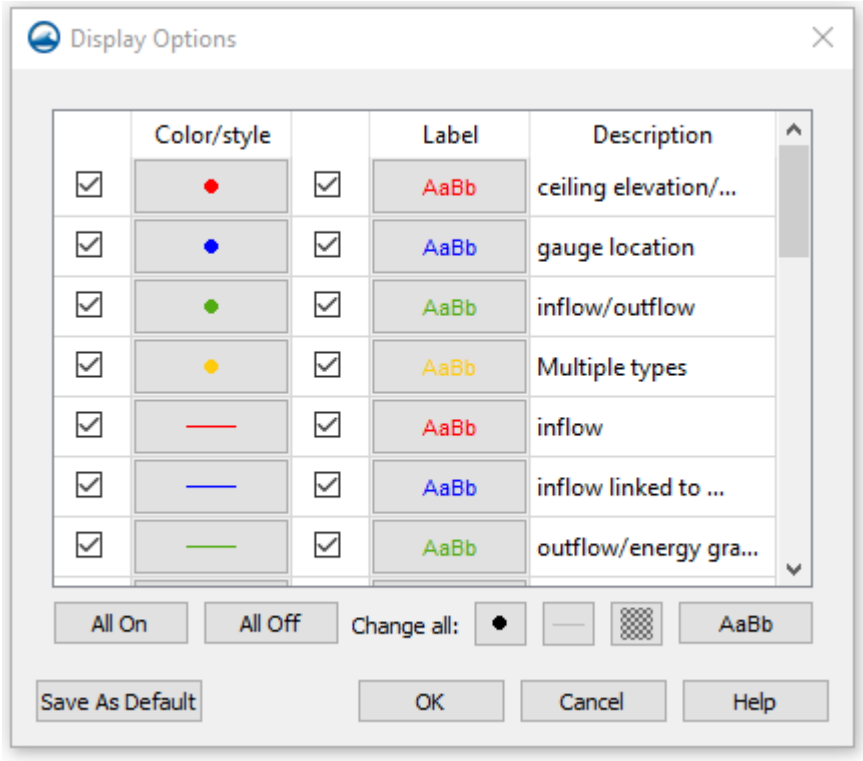
HydroAS Boundary Condition Coverage

- Arc attributes
  - Type - values
  - Name
- Node attributes



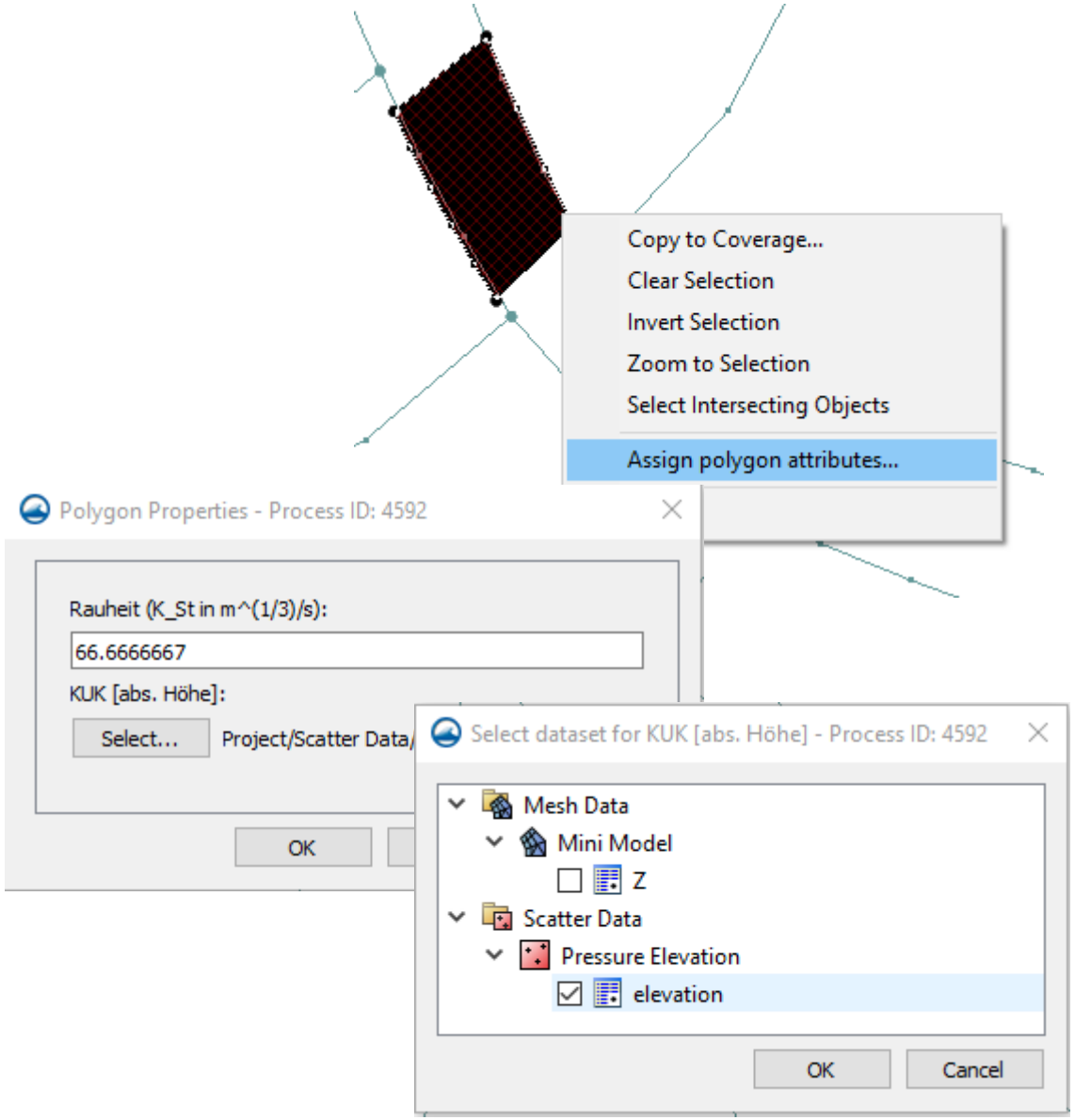
HydroAS Boundary Condition Display Attributes

- Color / Style / Font for each boundary condition type (nodes and lines).



Custom Tool – Pressure (KUK, Druckabfluss)

- Custom options
  - Coverage with Attributes
  - Tools in the Toolbox
- Pressure Zone Points
- Not version specific
- Stand alone python library
- Creates Boundary Condition coverag when “applied”
- Modular
  - Example of user specific tools



Questions

THANK YOU for participating!
Please contact us with any questions

Aquaveo Technical Support
support@aquaveo.com