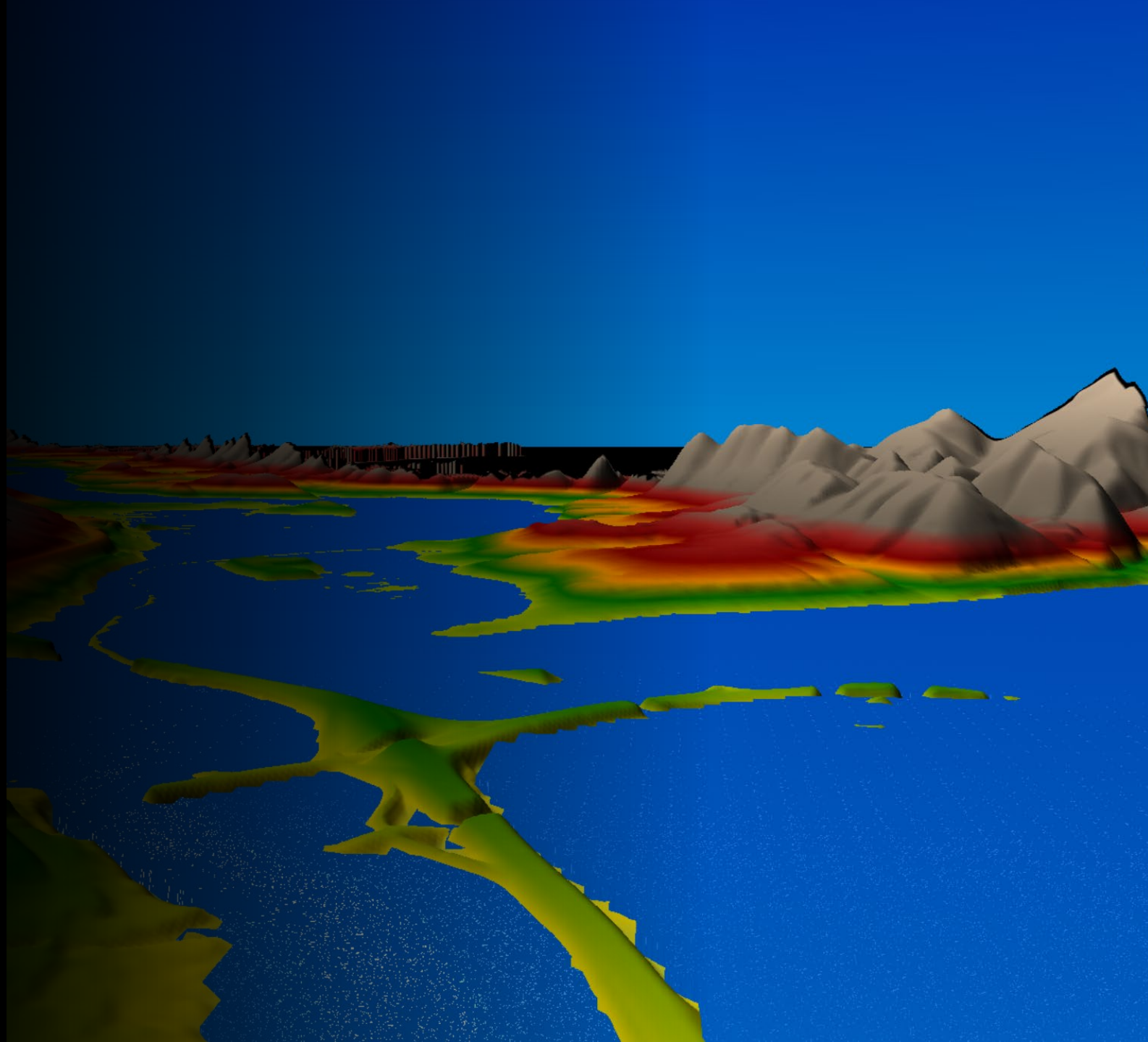


HEC-RAS Output

Eric Tichansky, PE, CFM



Goals

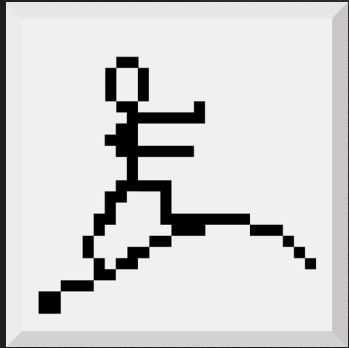
1. Where and How to Access HEC-RAS Output
2. Output and Visualization Options

Overview

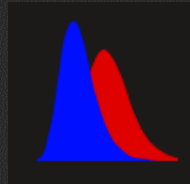
- Where output is stored
- Basic output options
- Available output:

- Stage and Flow Hydrographs
- Water Surface Profiles
- Cross Sections
- Rating Curves
- General Profiles
- Tabular Output
- Detailed Log
- Computation Level Output
- 3D Viewer
- RAS Mapper – coming up

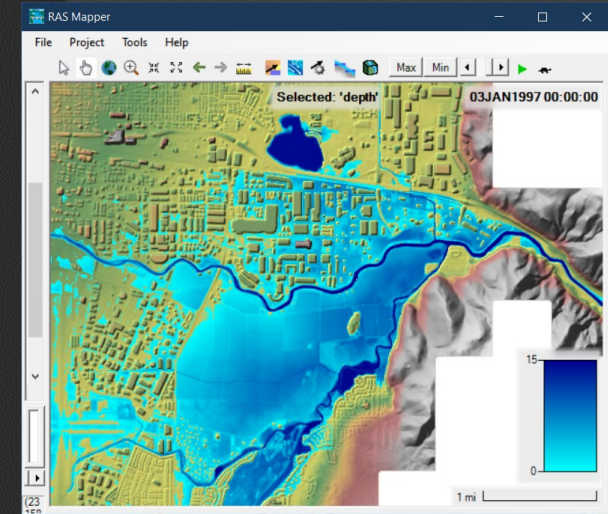
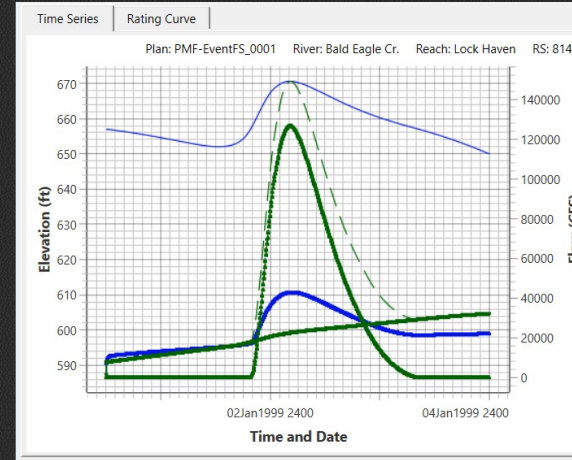
HEC-RAS Output Overview



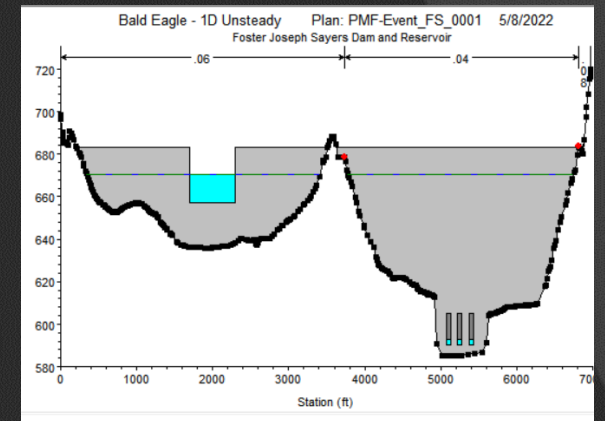
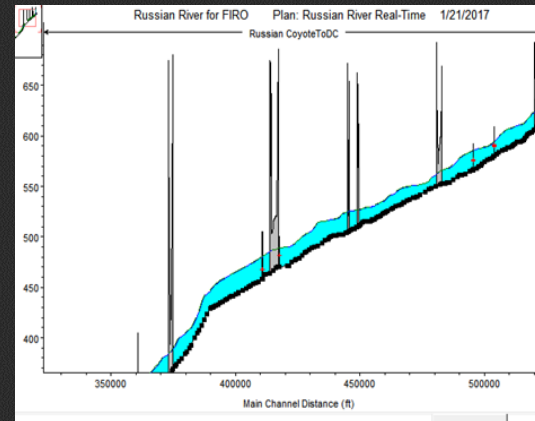
**.p01*



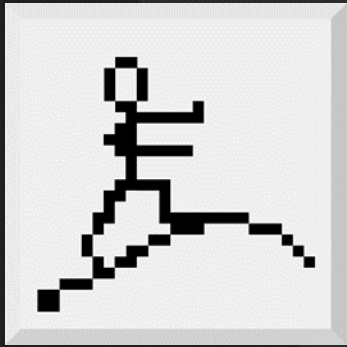
**.p01.hdf*



**.o01*



HEC-RAS Output Overview

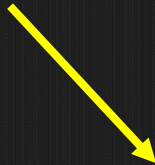


***.p02**



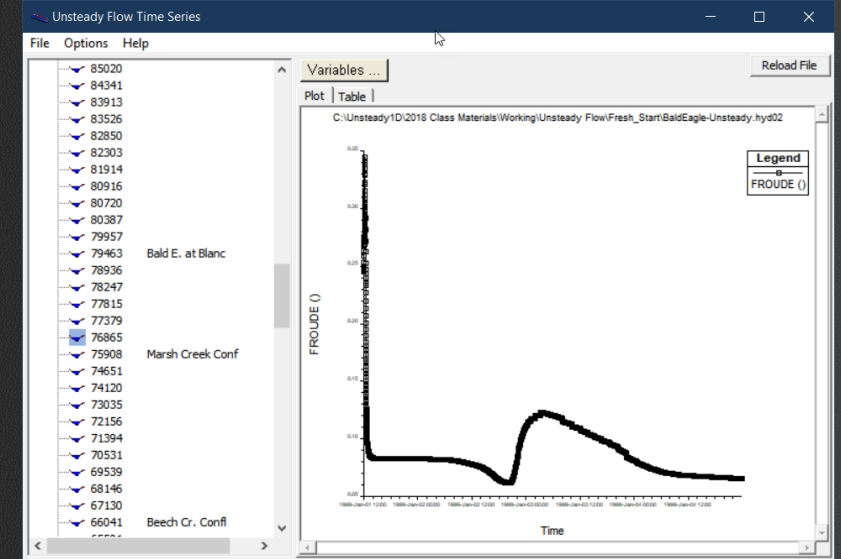
***.hyd02**

**Computation
Level Output**



***.bco02**

**Computation
Log**



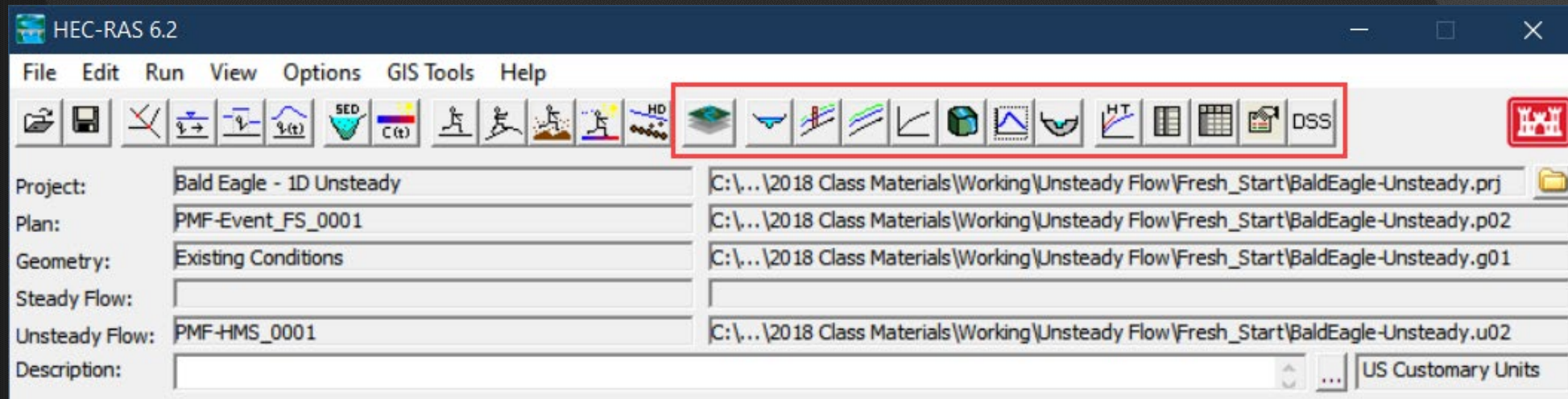
```
RulePoolAndLat.bco01 - Notepad
File Edit Format View Help

#####
#
#           1D and 2D Unsteady Flow Module
#
#           HEC-RAS 6.2 March 2022
#
#           08MAY22 at 20:56:48
#
#####

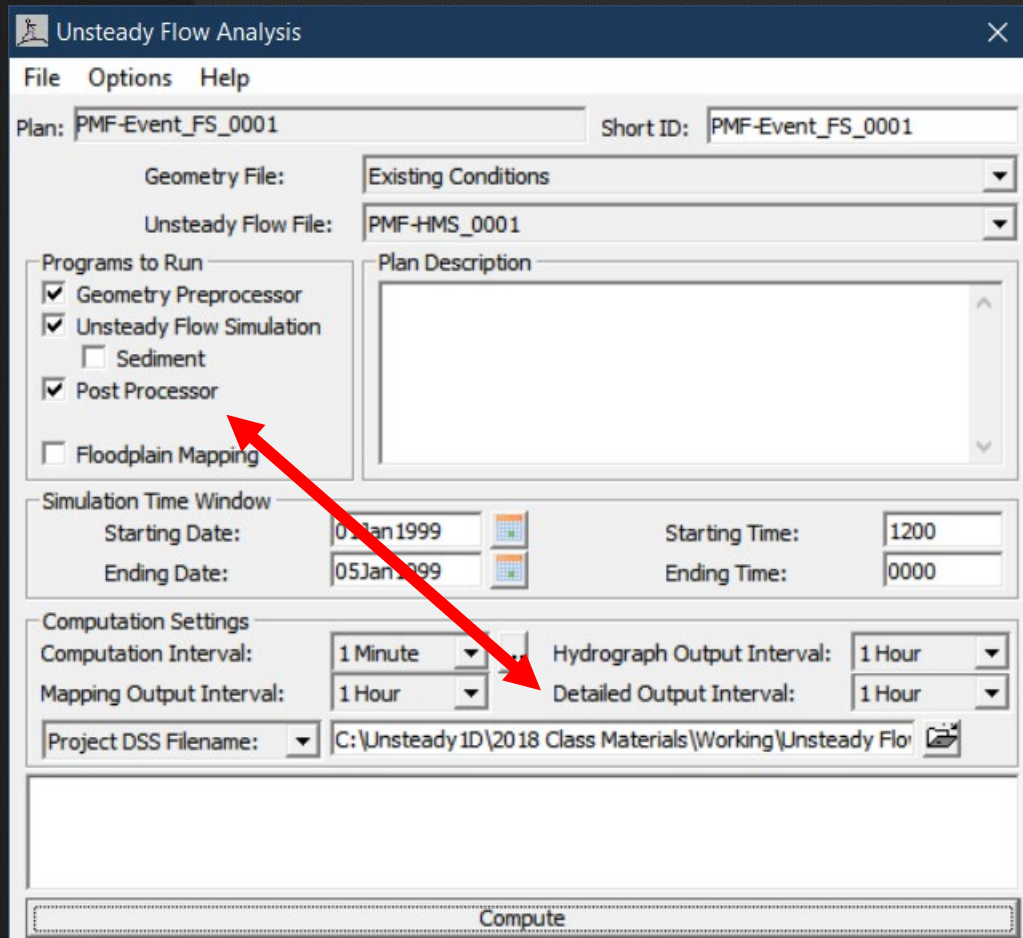
Starting Unsteady Flow Computations

*** Start of New Time Step ***
```

Output Access



Output Interval Options

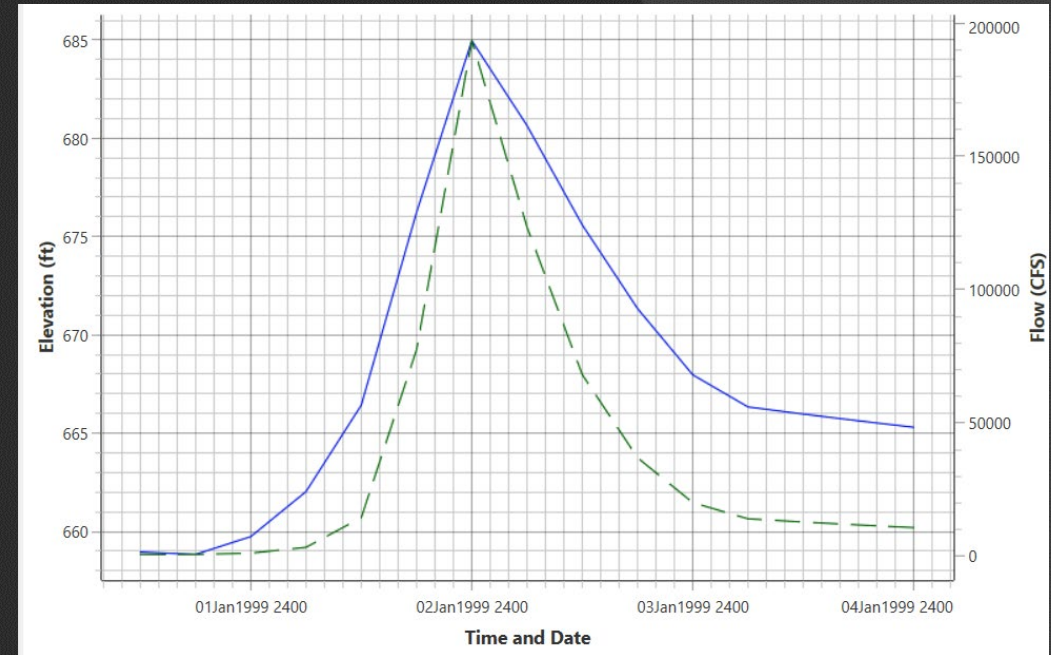


- Must be:
 - Greater than computation timestep
 - Divisible by computation timestep
- Hydrograph Output Interval
 - Stage and Flow Hydrographs
- Detailed Output Interval
 - Post-Processor (Profiles, XS, Tables)
- Mapping
 - RAS Mapper



Importance of Output Interval

- Too coarse
 - Miss peaks
 - Blocky hydrographs
 - Rough animations
 - Bad for troubleshooting
- Too fine
 - Large output files
 - Long post-process time

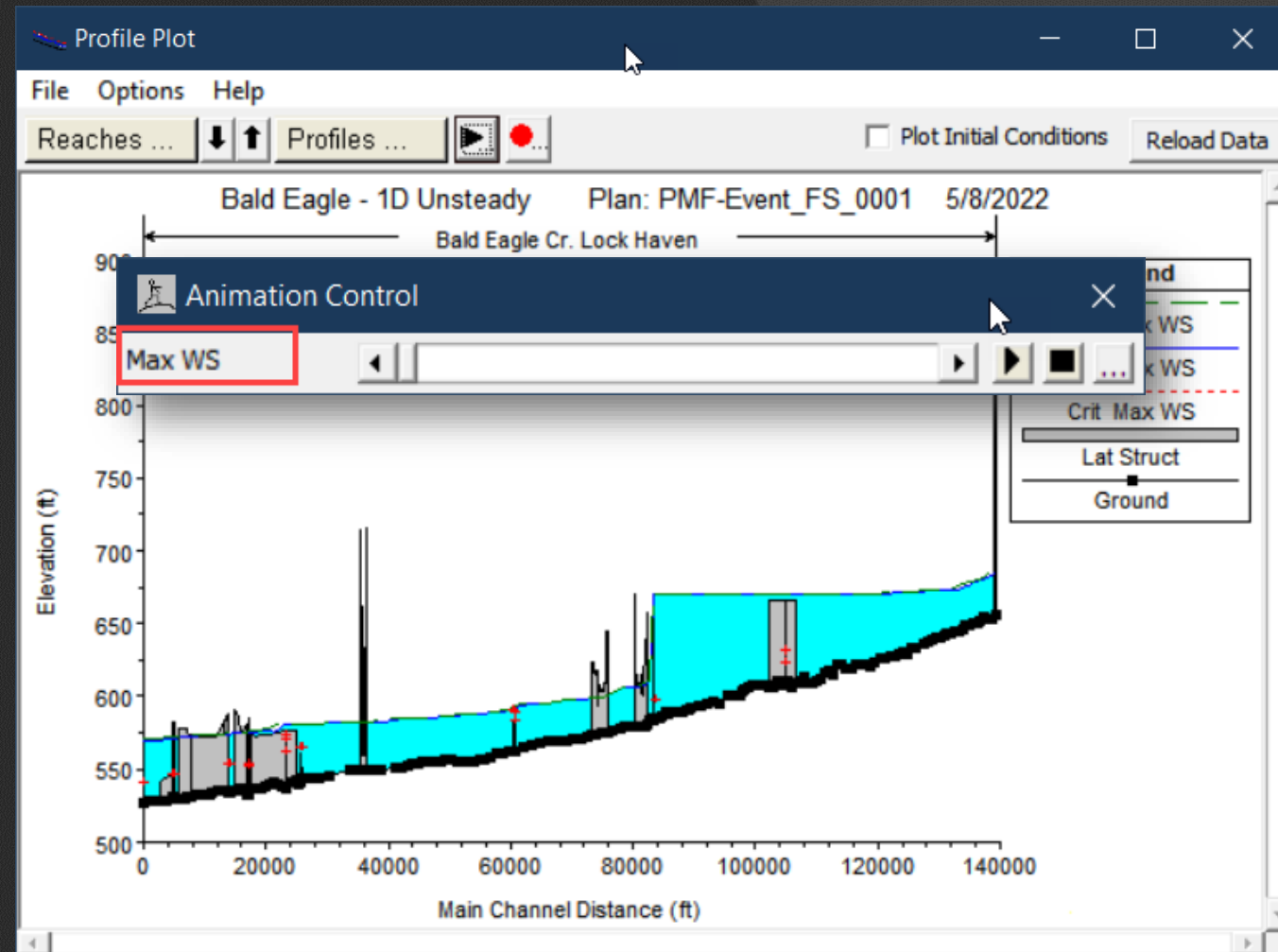


Computations Summary

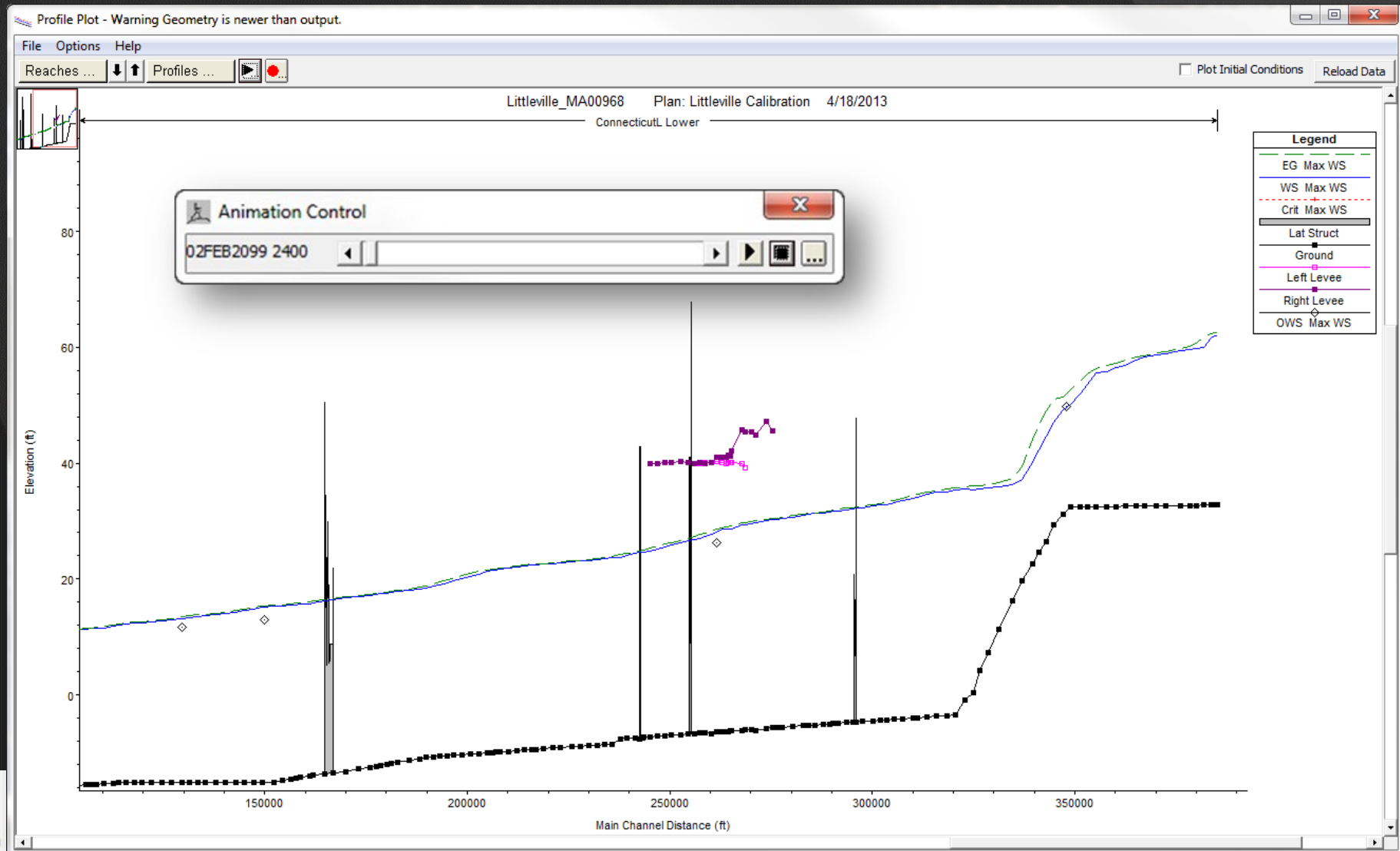
<u>Computation Task</u>	<u>Time(hh:mm:ss)</u>
Completing Geometry	1
Preprocessing Geometry	1
Completing Event Conditions	<1
Unsteady Flow Computations	17
Post-Processing	7:11
Generating Time Series Post Process	<1
Complete Process	7:34

Output Interval – Max Profile

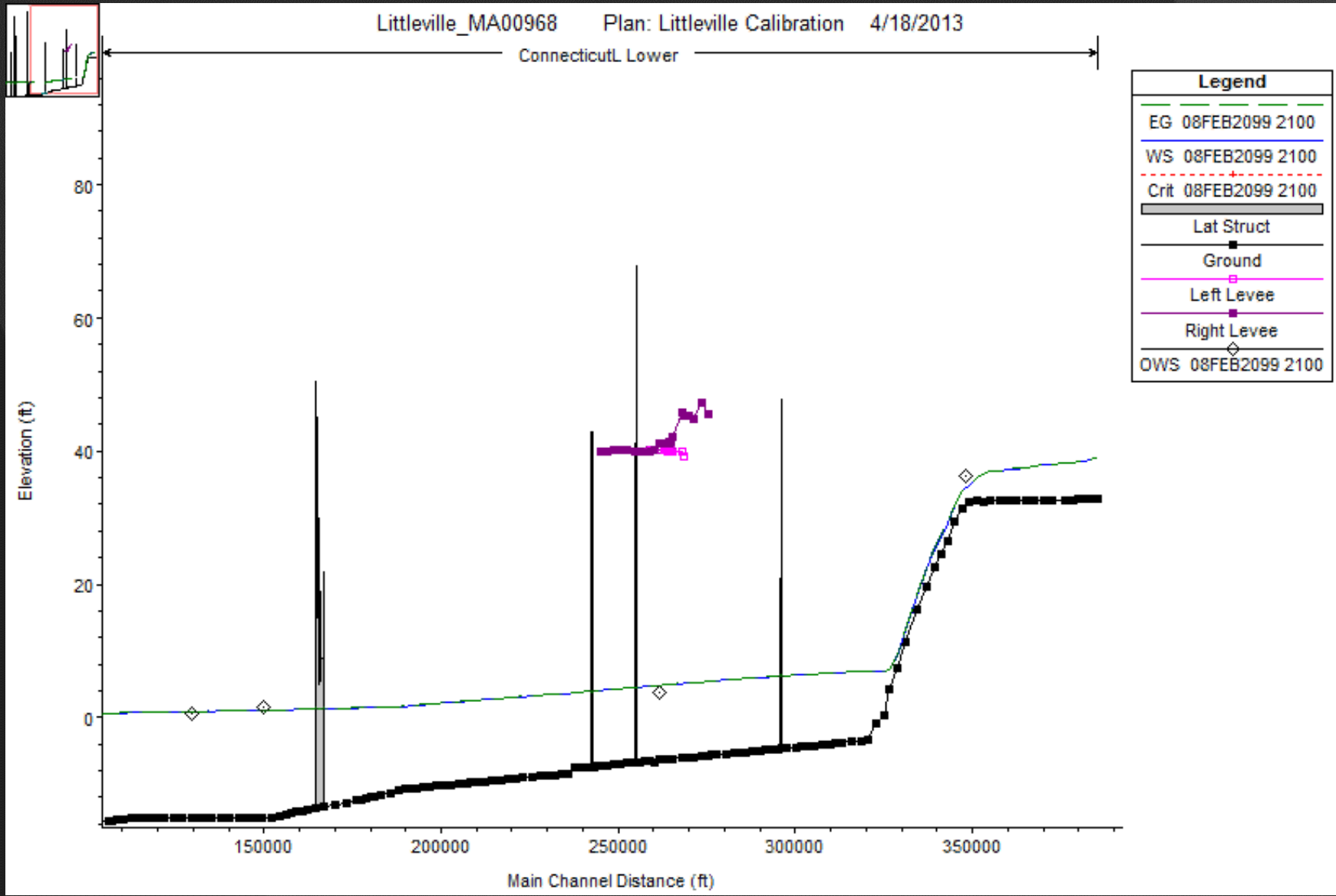
- Default output
- Max WS at all locations
- Regardless of output interval
- Not synchronous



Profile Plot

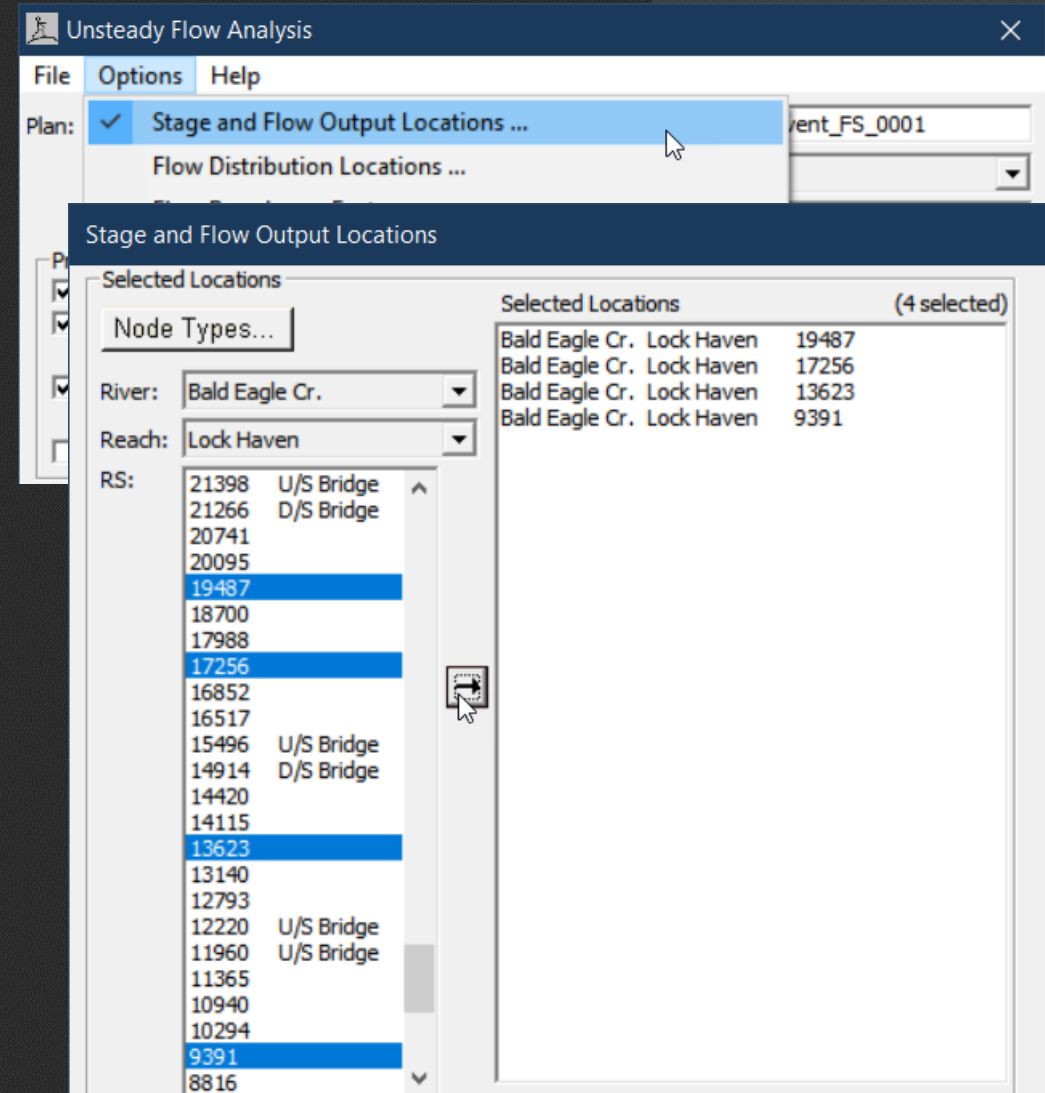


ConnecticutL Lower



Stage and Flow Hydrographs

- Output at default locations
 - Upstream and downstream XS of each reach
 - Upstream and downstream XS of bridges, inline structures, etc.
 - Observed data locations
- User selected locations
- Each element type has a default plot format



Stage and Flow Hydrograph

File Type Options Help

River: Bal

Plans ...

Reach: Lock

Number of Decimal Places ...

Sta.: 81454 IS

Plot Sta

Obs Flow

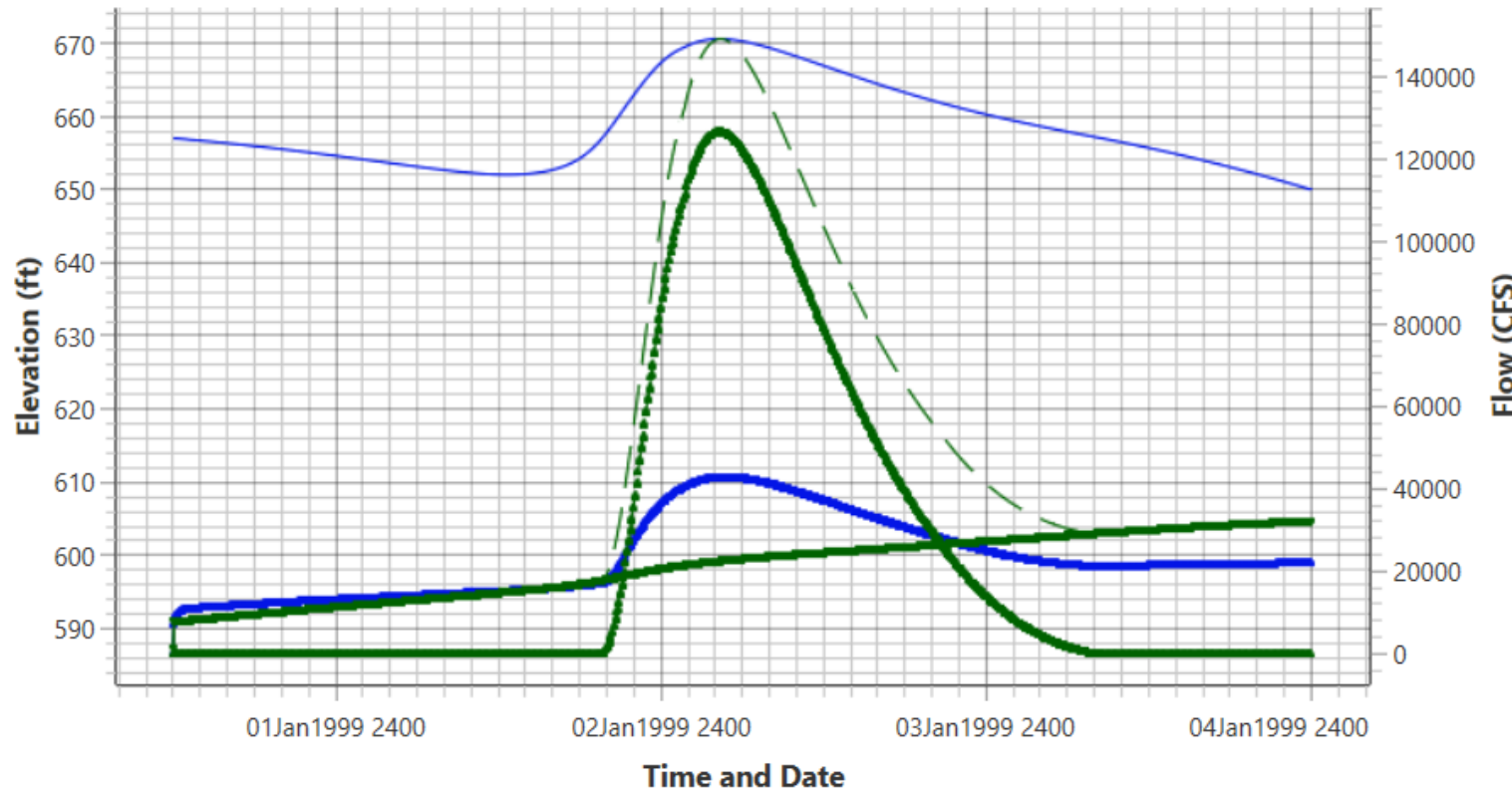
Use Ref Stage

Time Series	Maximum	Time at Max	Volume ac-ft
Stage HW	670.56	03Jan1999 0418	
Stage TW	610.79	03Jan1999 0442	
Total Flow	149050.8	03Jan1999 0424	312593.69

Time Series

Rating Curve

Plan: PMF-EventFS_0001 River: Bald Eagle Cr. Reach: Lock Haven RS: 81454

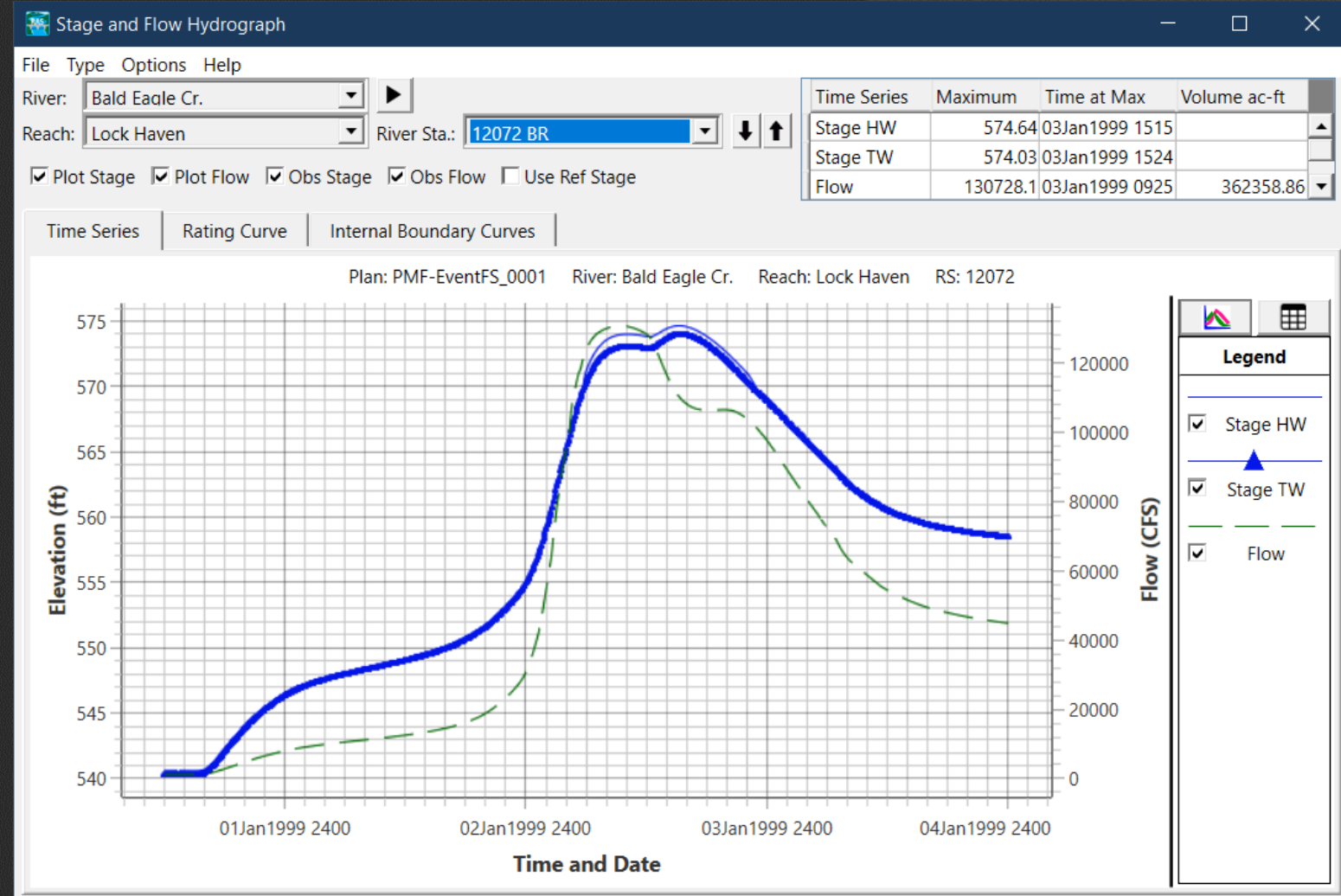
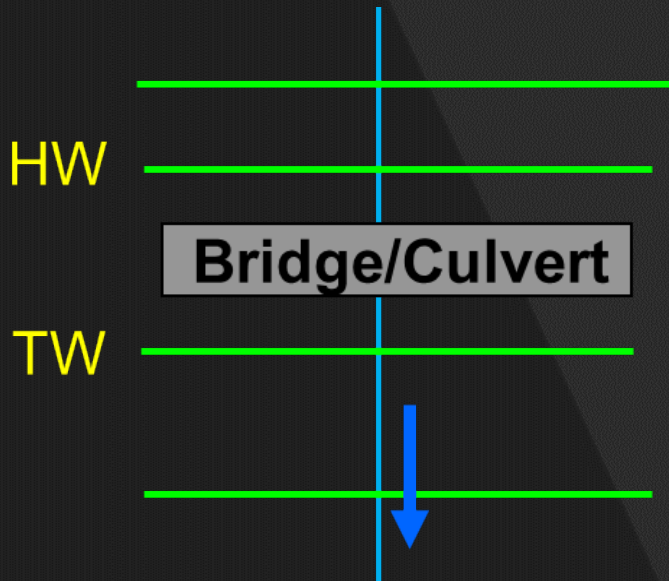


Legend

- Stage HW
- Stage TW
- Total Flow
- Weir Flow
- Total Gate Flow

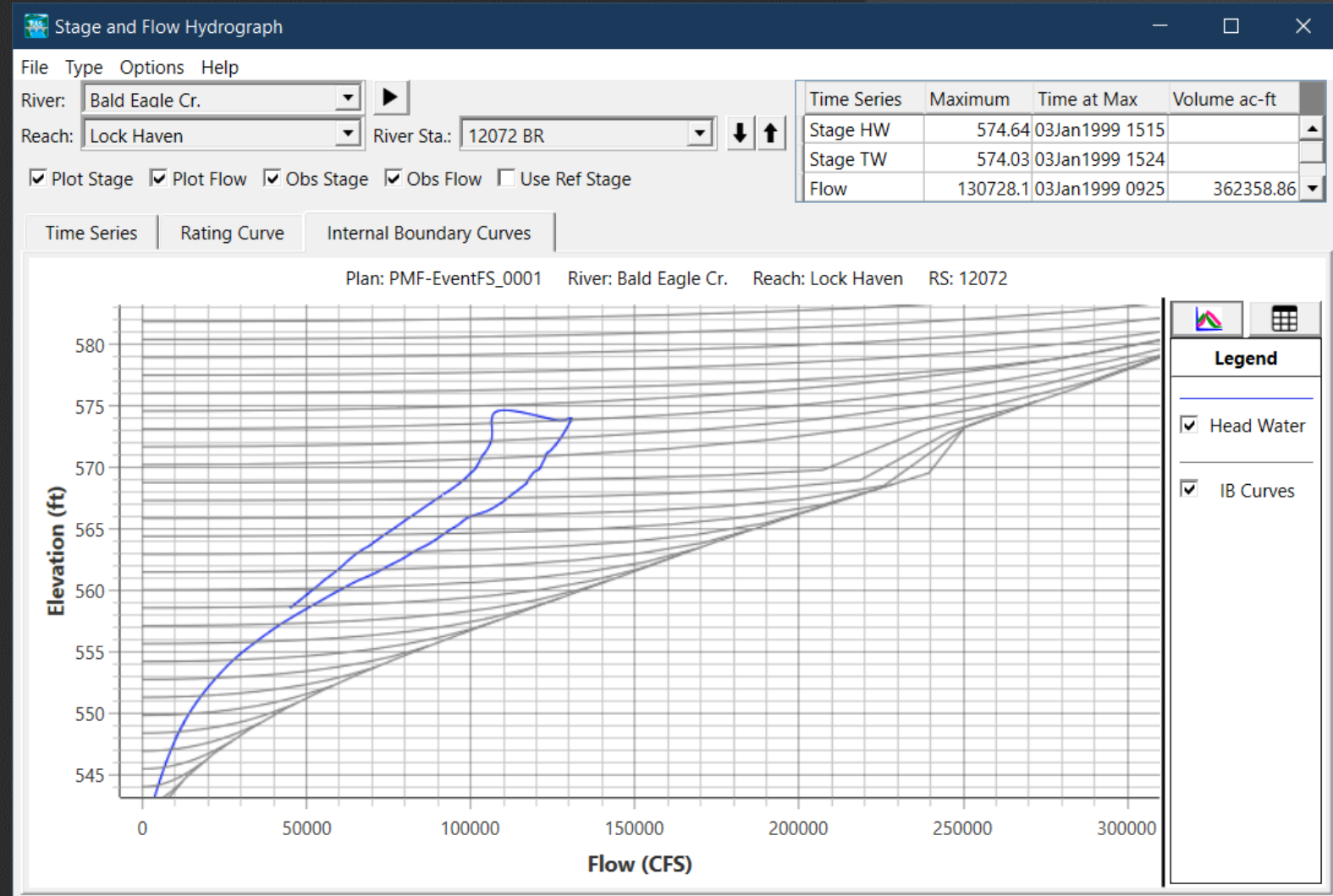
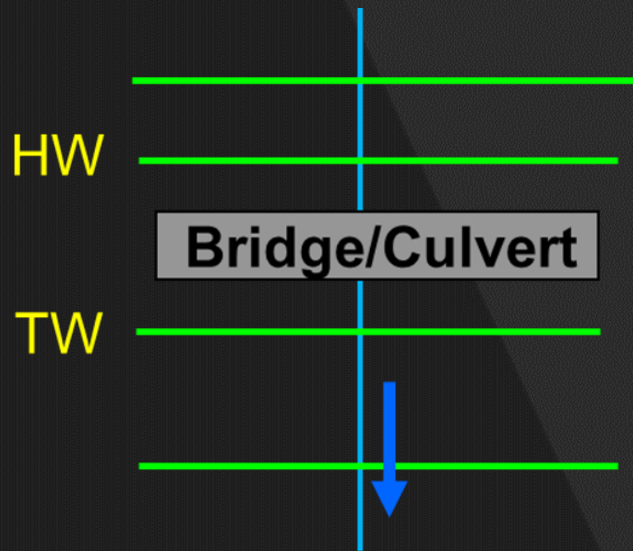
Hydrographs – Bridges and Culverts

- Stage Headwater
- Stage Tailwater
- Flow



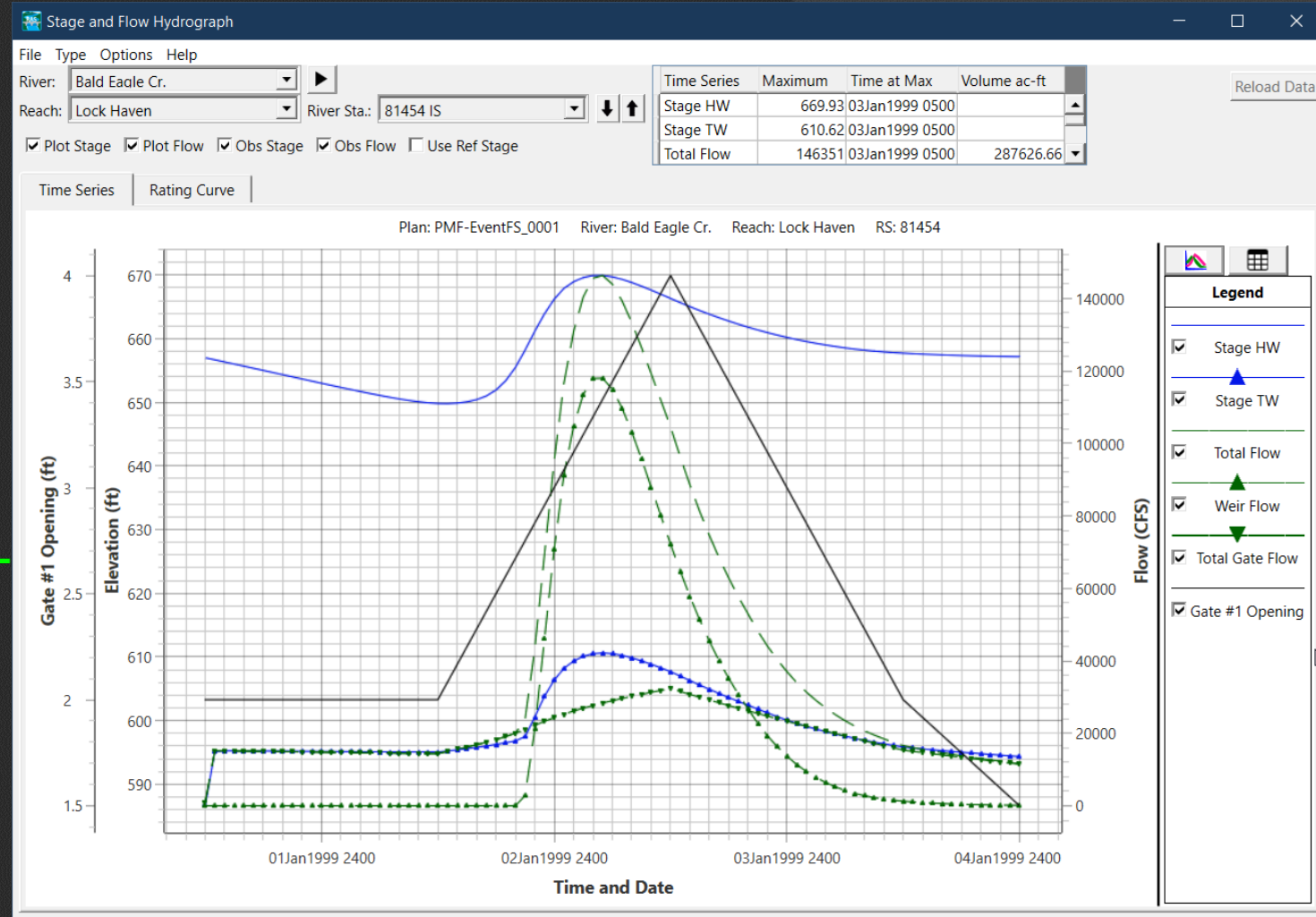
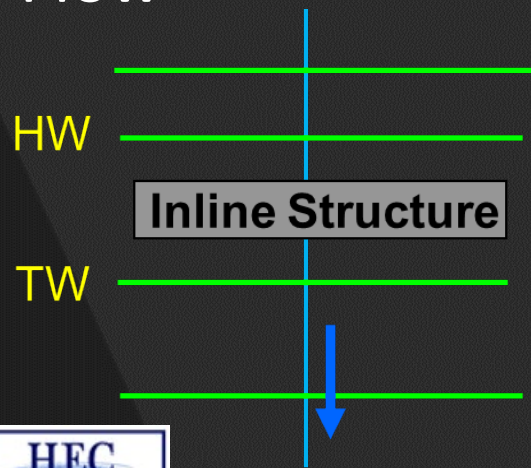
Hydrographs – Bridges – Internal Boundaries

- Rating Curve
- IB Curves

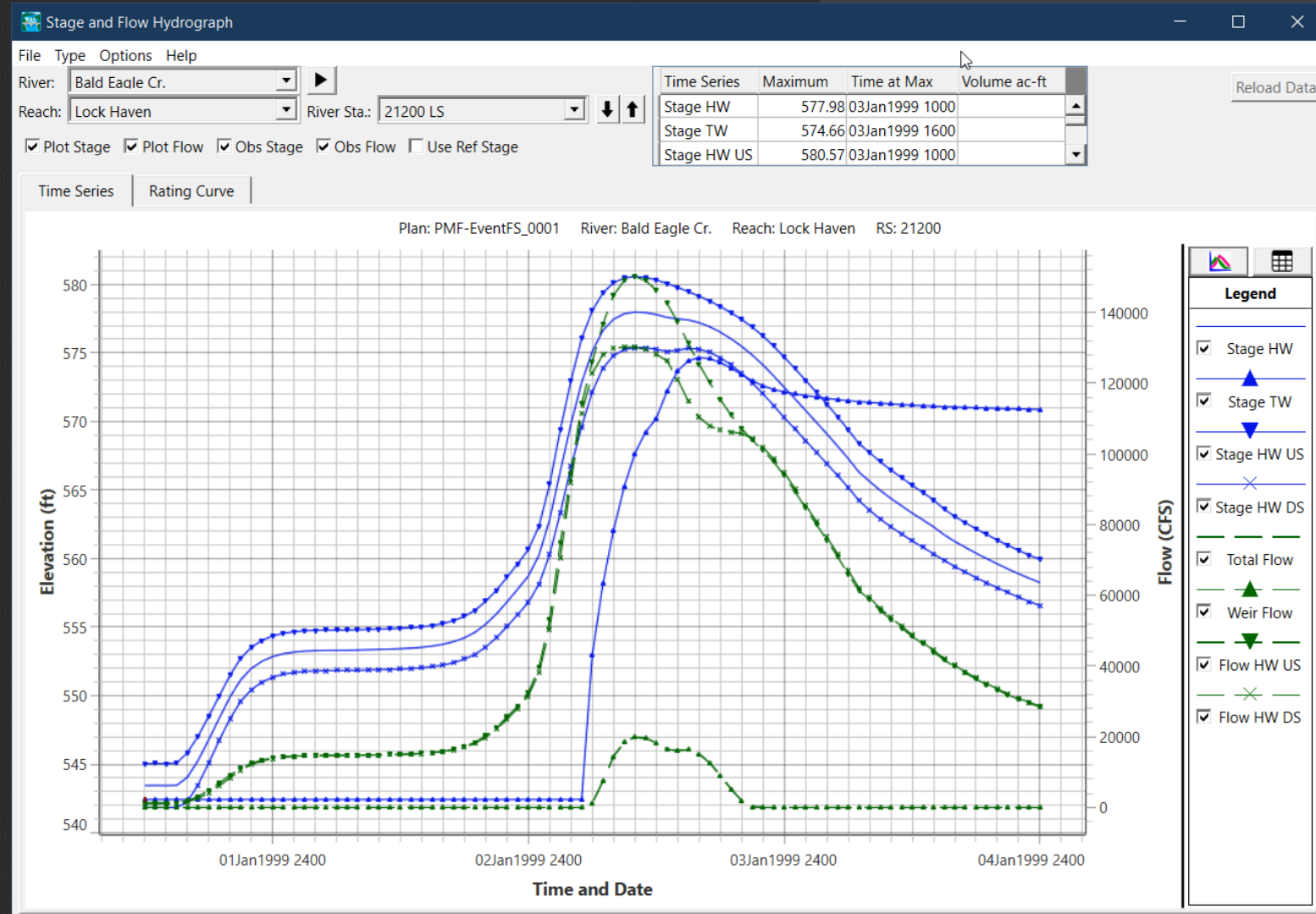
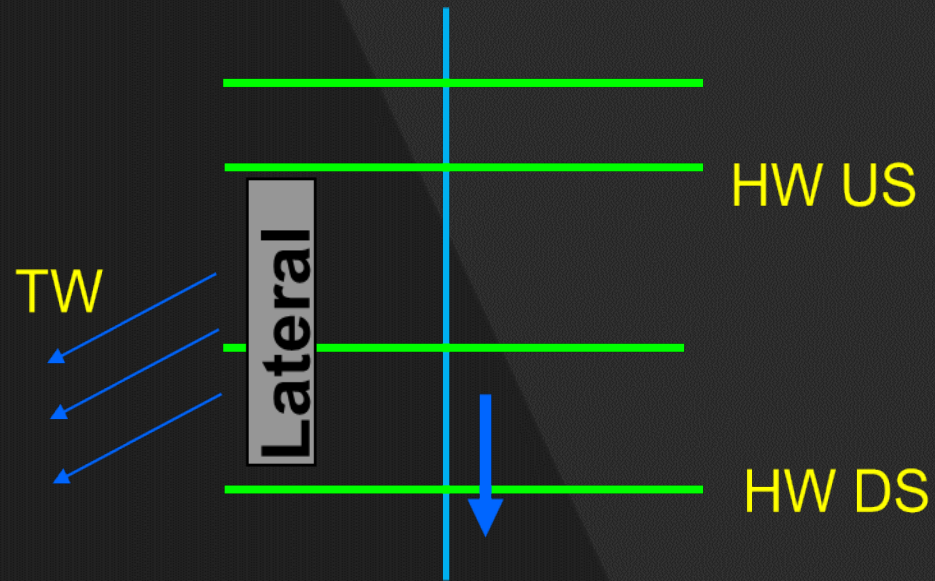


Hydrographs – Inline Structures

- Stage Headwater
- Stage Tailwater
- Flow Total
- Weir Flow
- Total Gate Flow

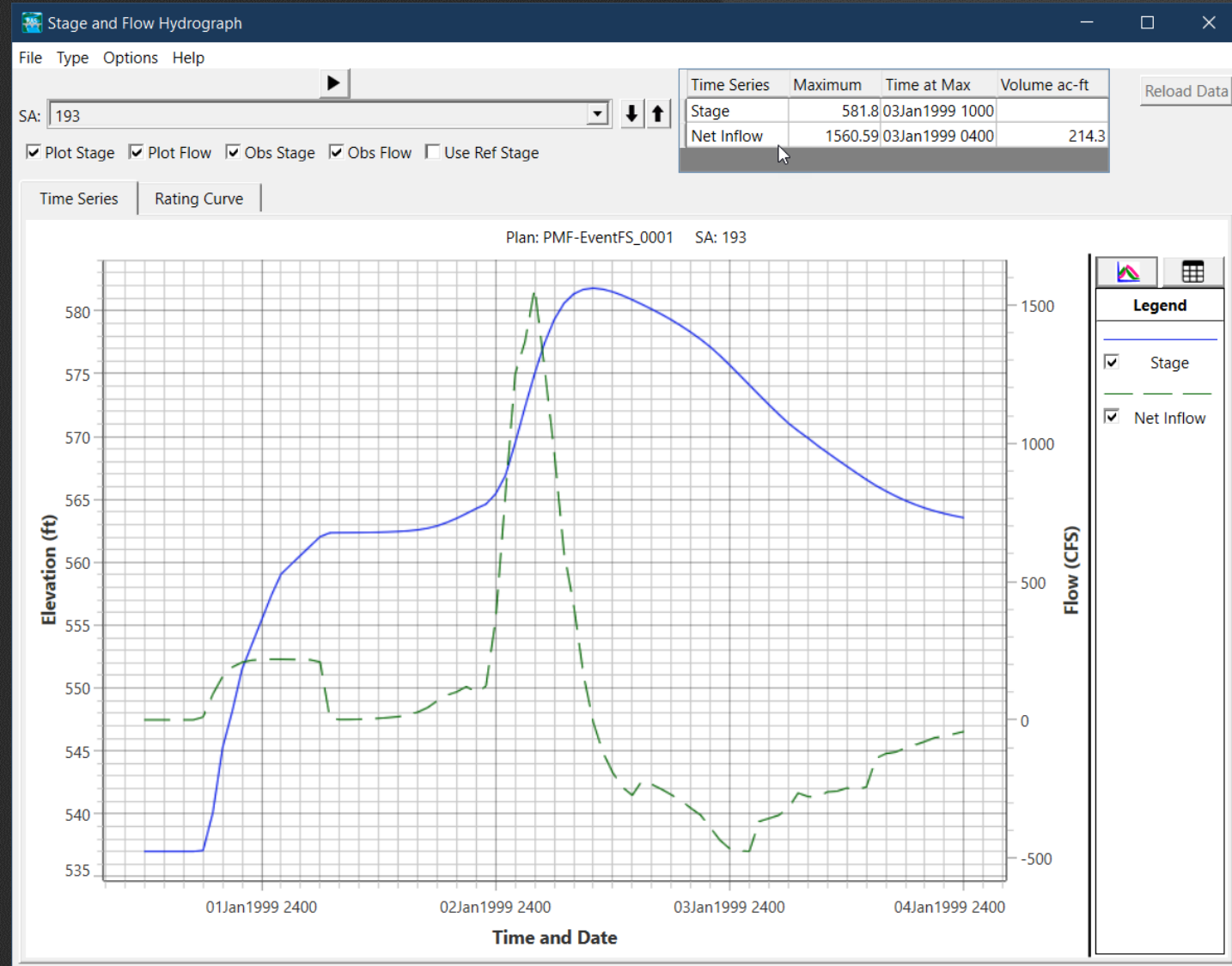
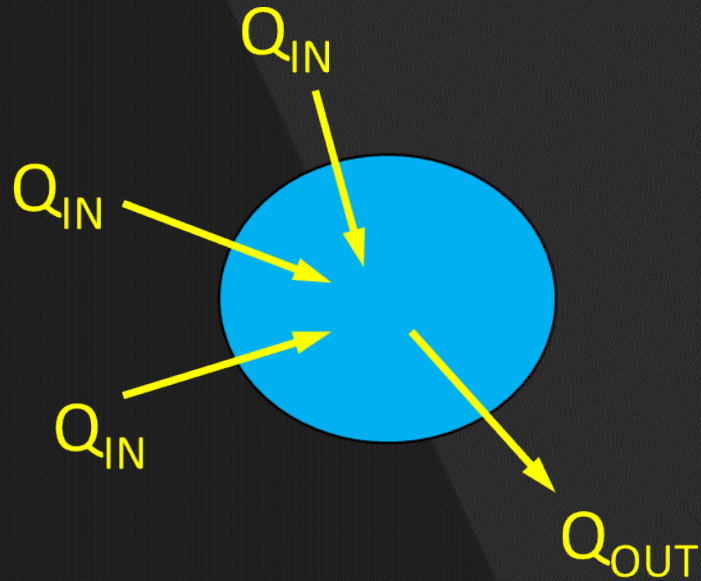


Hydrograph – Lateral Structure

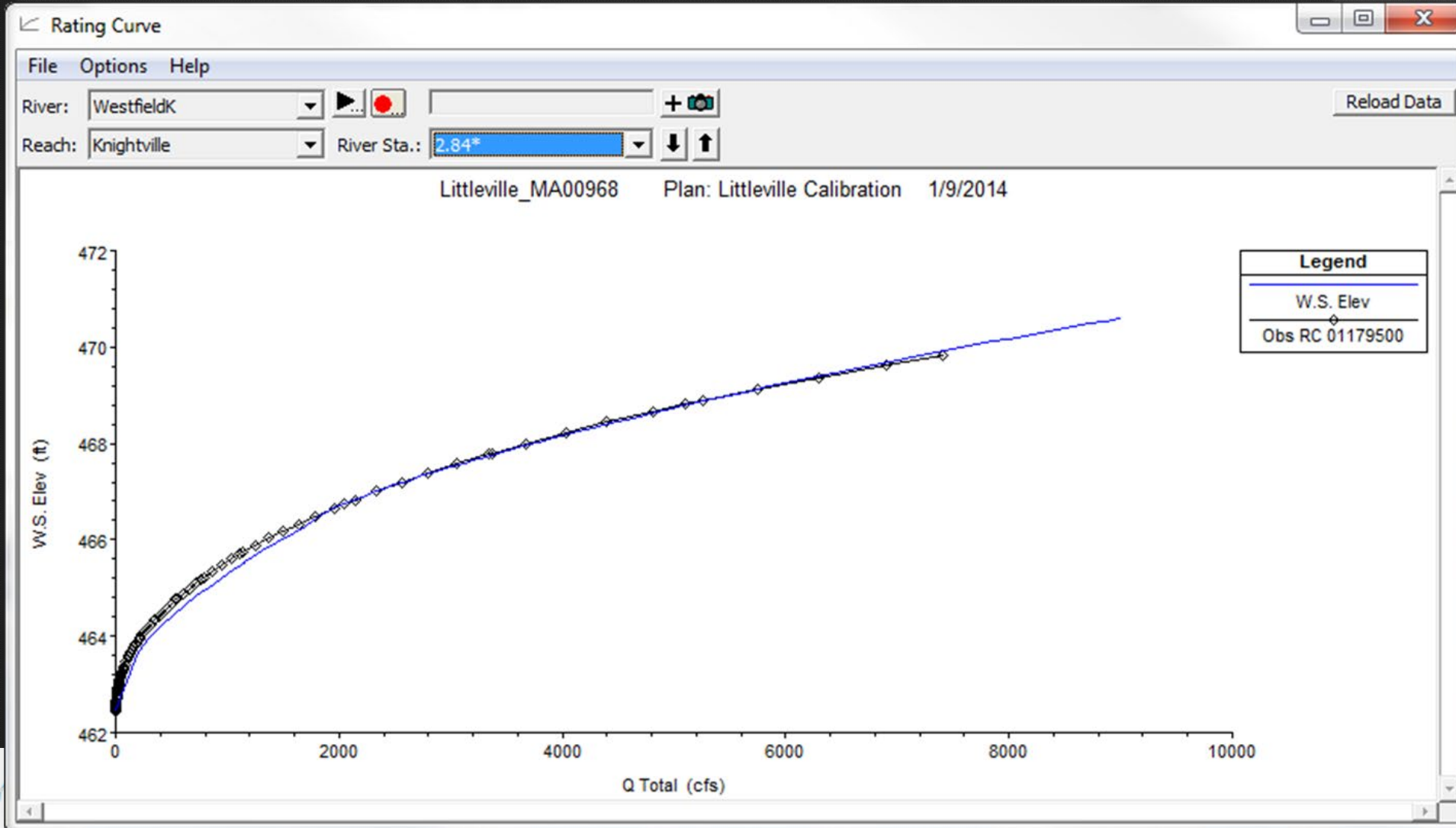


Hydrograph – Storage Area

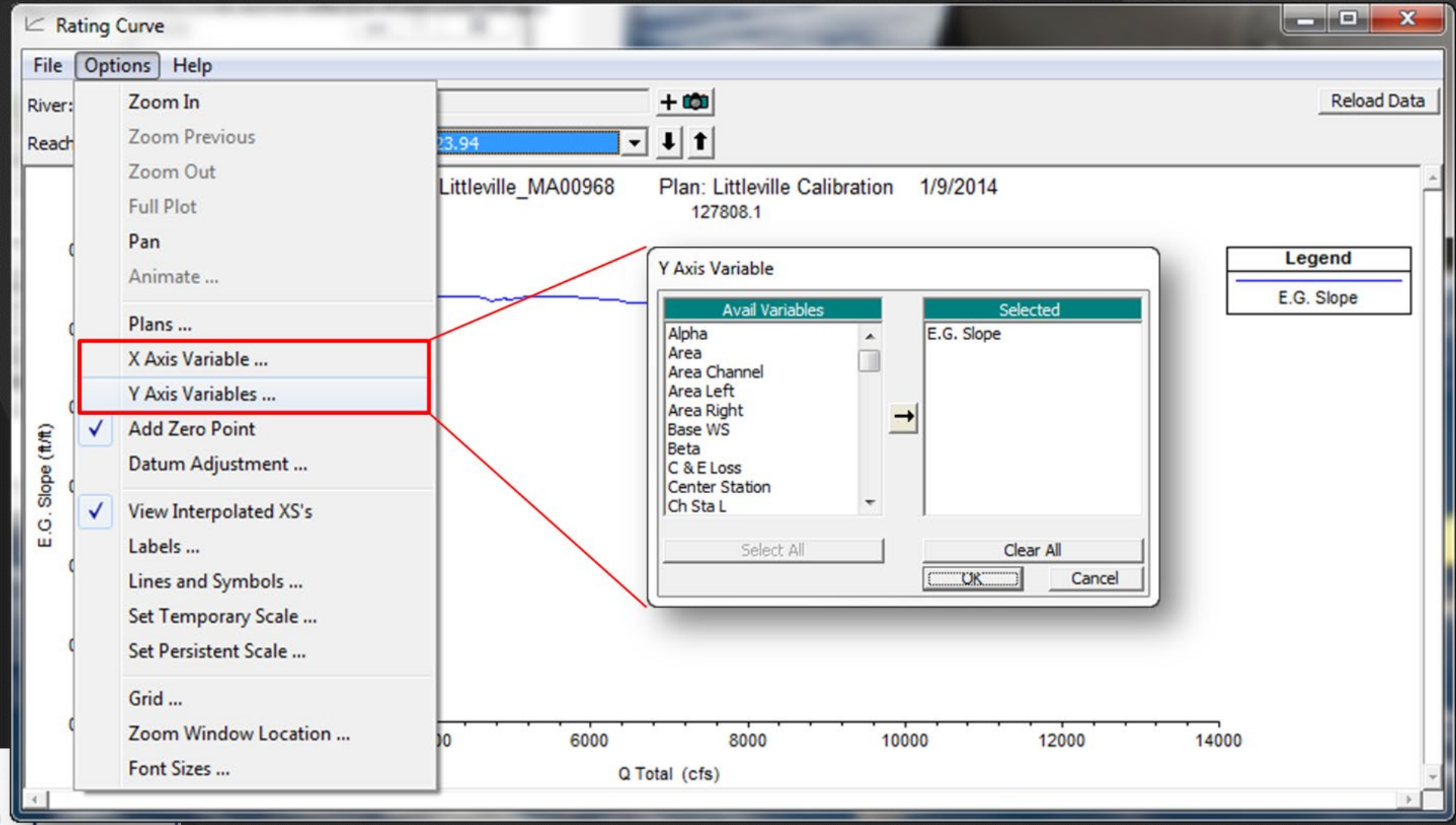
- Stage
- Net Inflow



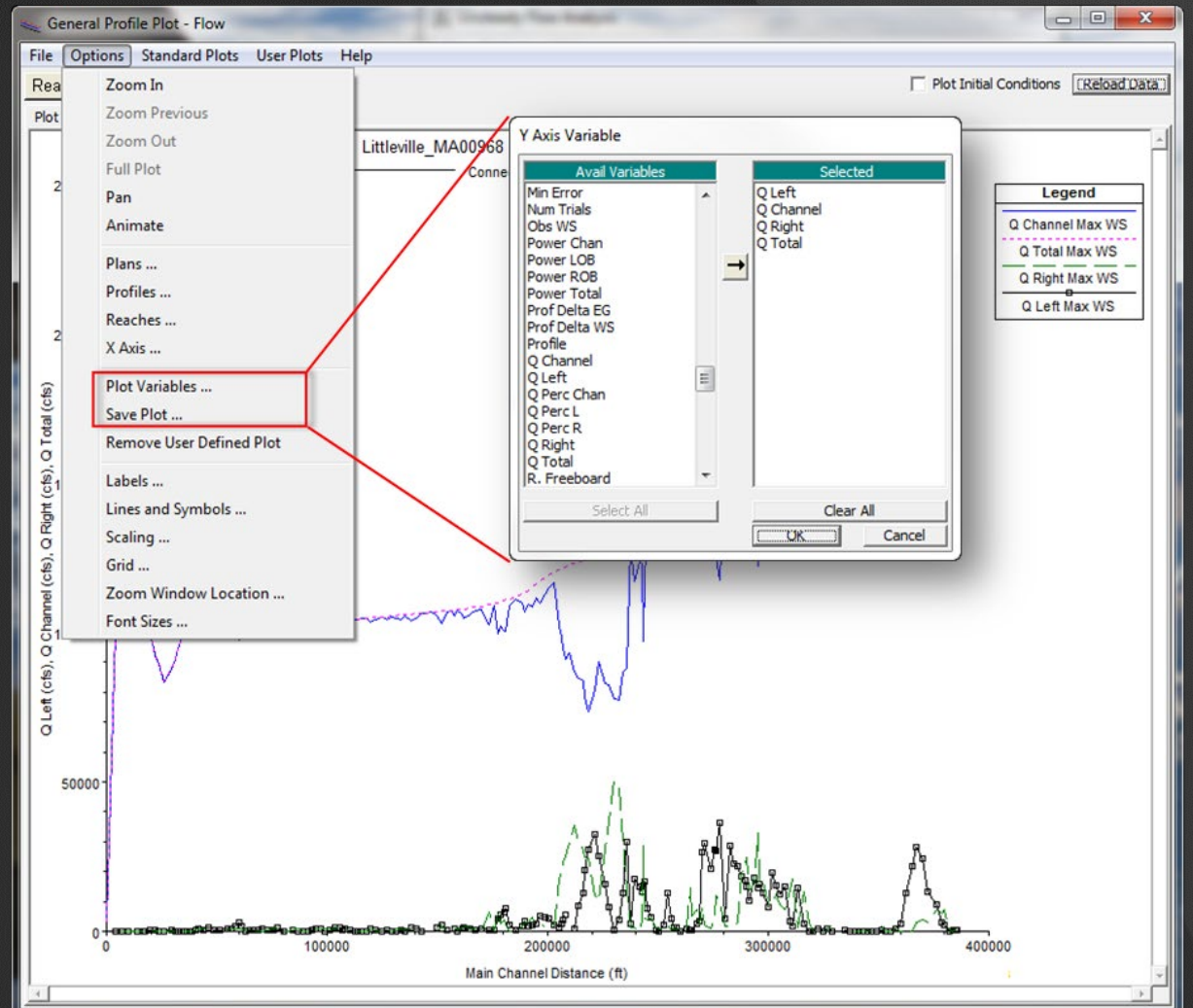
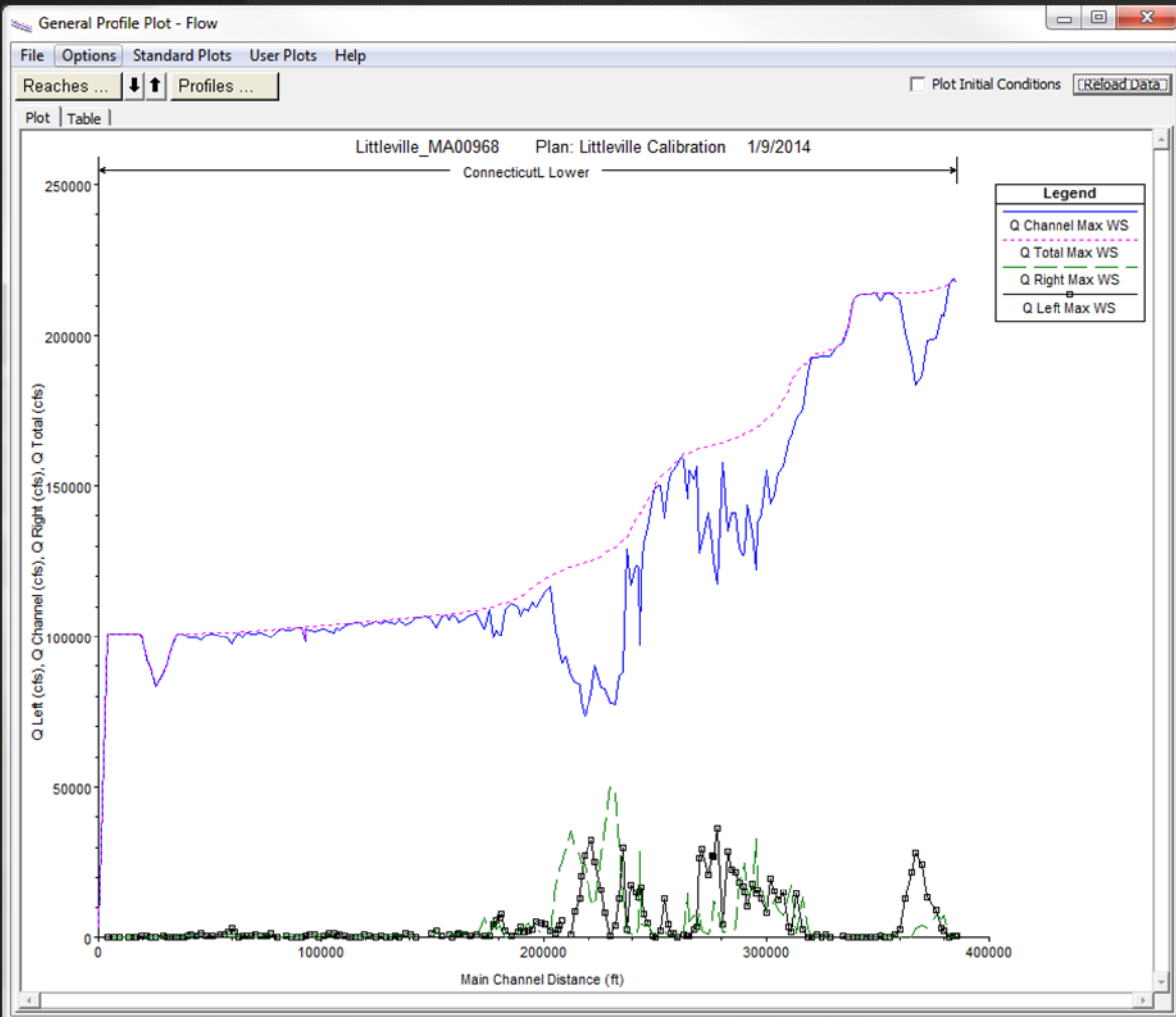
Rating Curves



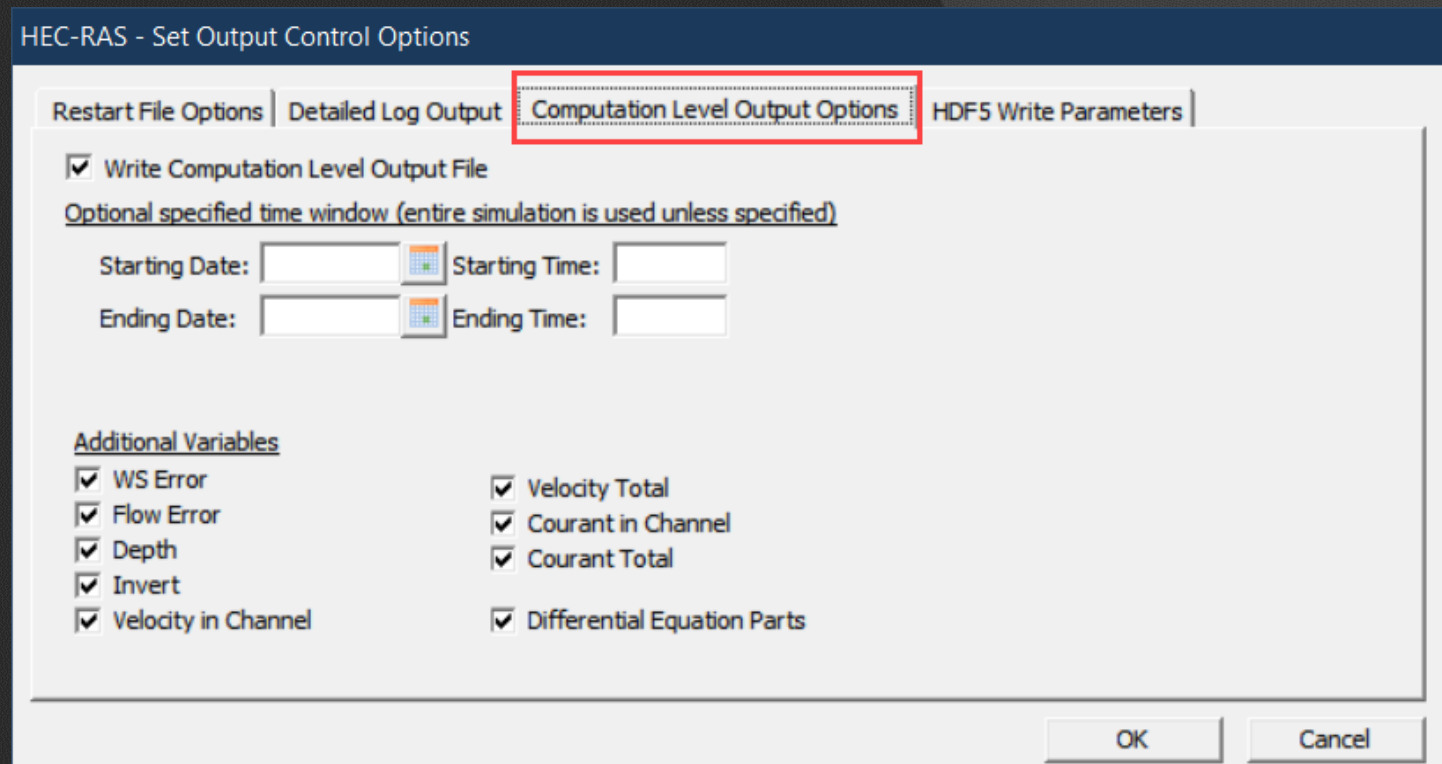
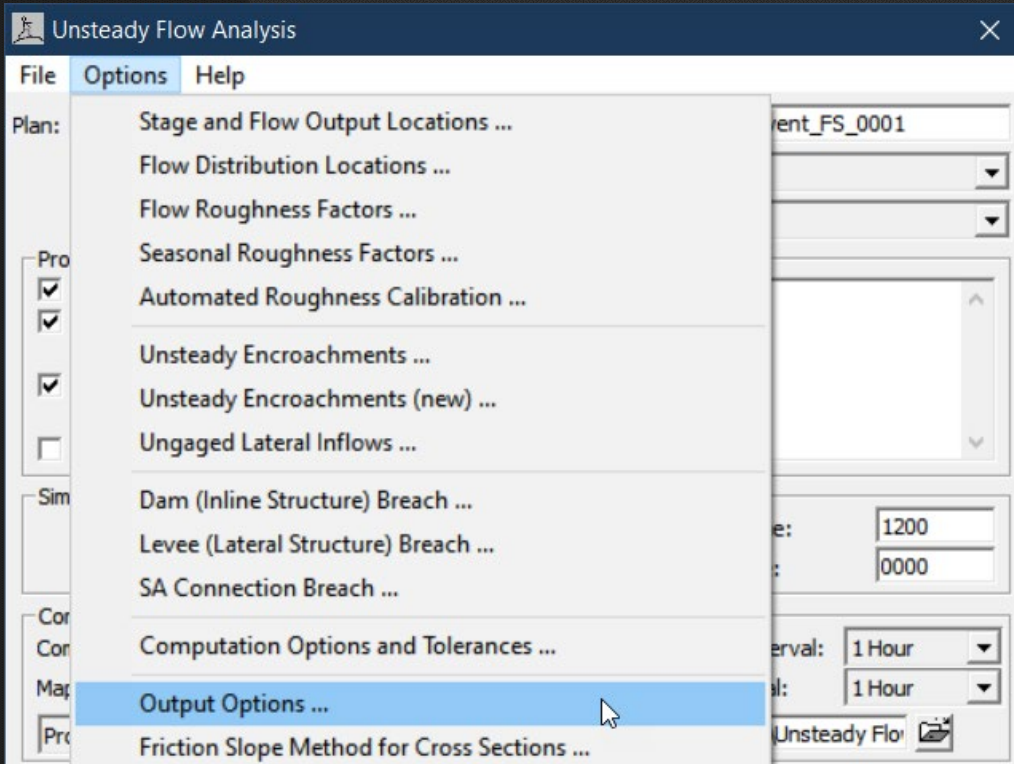
Rating Curves



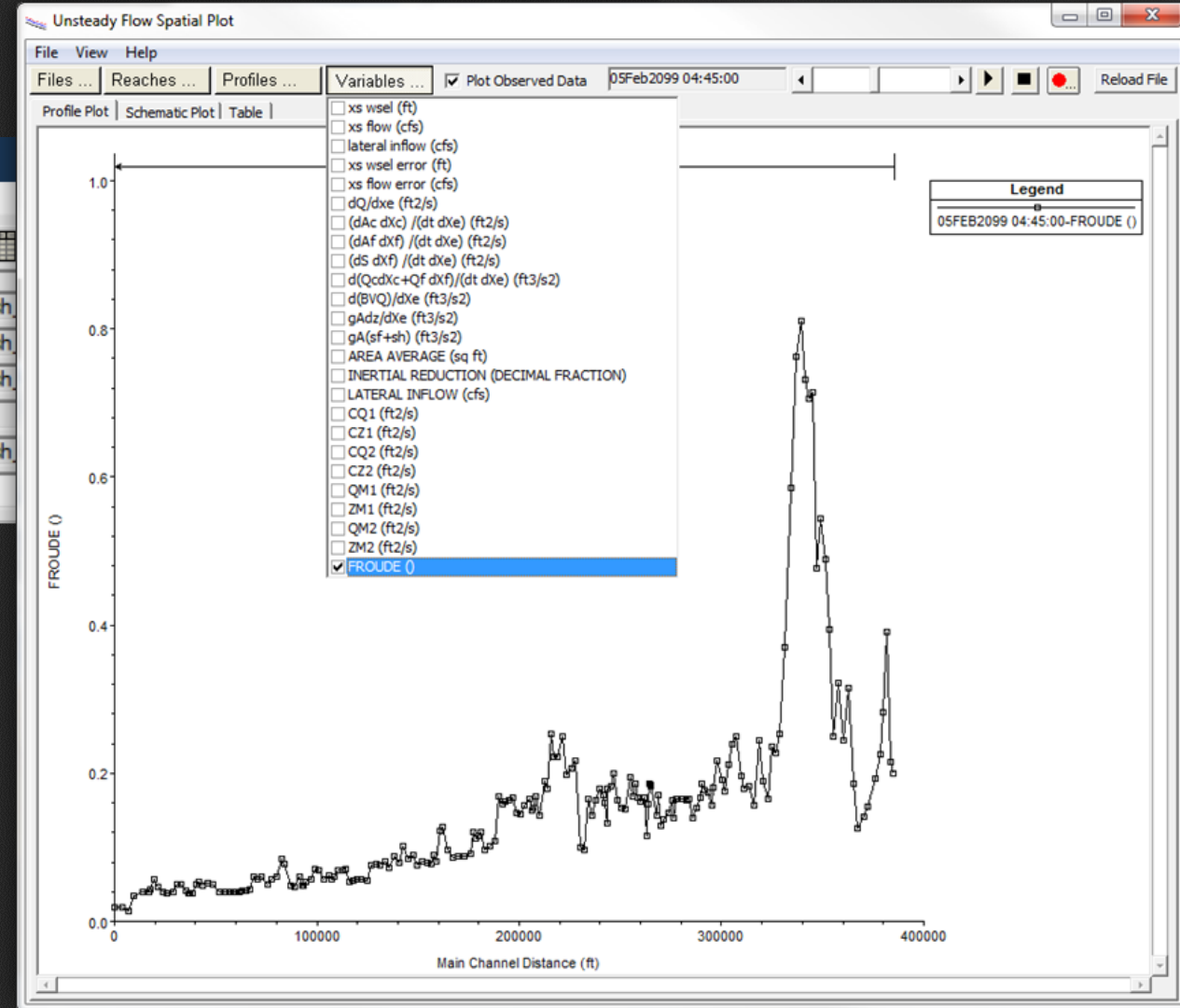
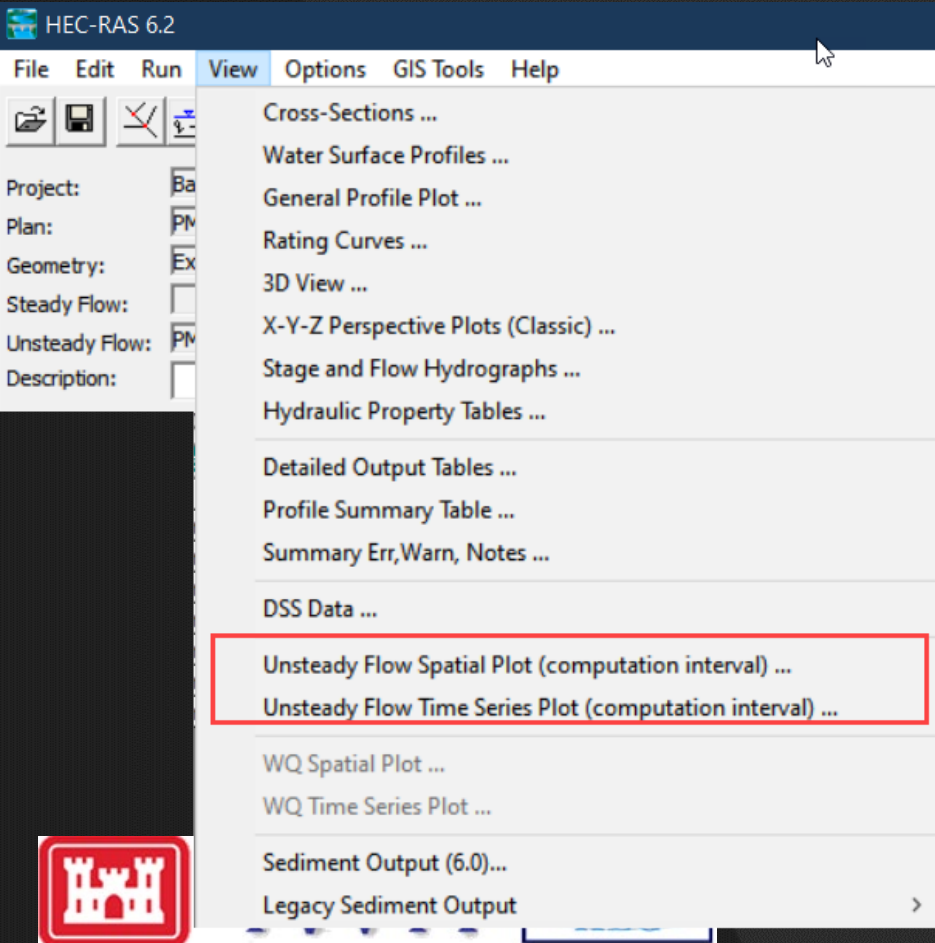
General Profile Plot



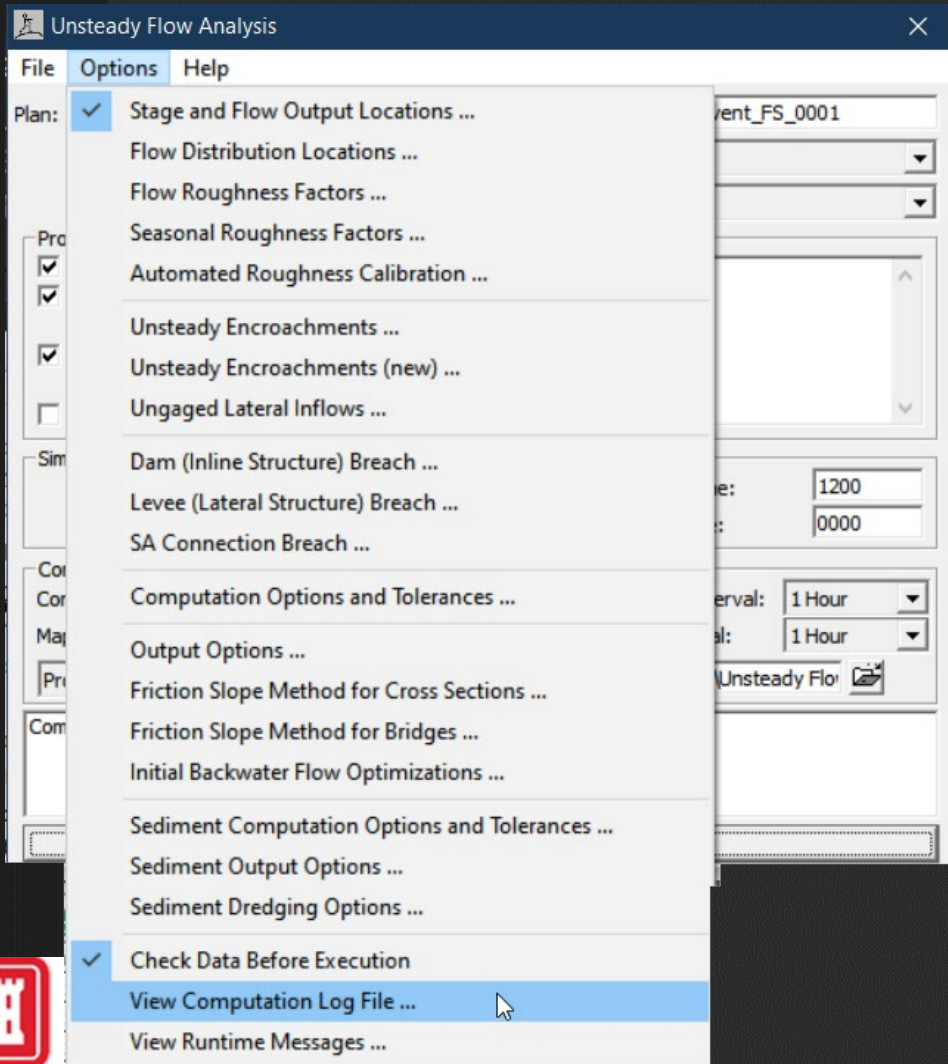
Output Options



Computation Level Output



Computation Log File



```
RulePoolAndLat.bco01 - Notepad
File Edit Format View Help

#####
#
#
#          1D and 2D Unsteady Flow Module
#
#
#          HEC-RAS 6.2 March 2022
#
#          08MAY22 at 20:56:48
#
#####

Starting Unsteady Flow Computations

*** Start of New Time Step ***

Rule Set for Nittany River Weir Reach 58

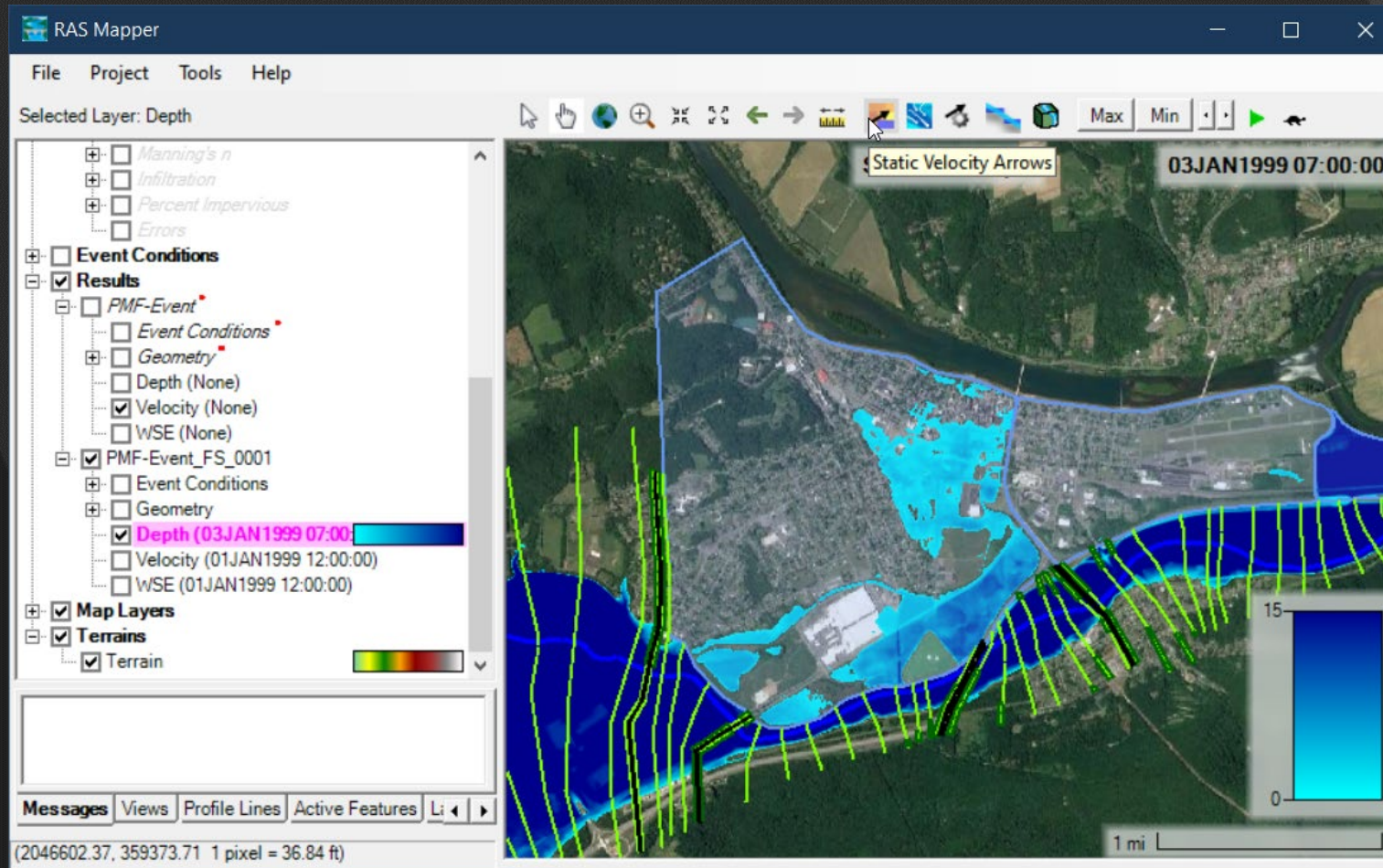
0002          Hour of Day = 0.0
0006          Flow at Inline Weir = 5250.
0010          Flow to Divert = 262.5
0013 SET      Structure.Total Flow (Fixed) = 262.5

Rule Set for Nittany River Weir Reach 41.75

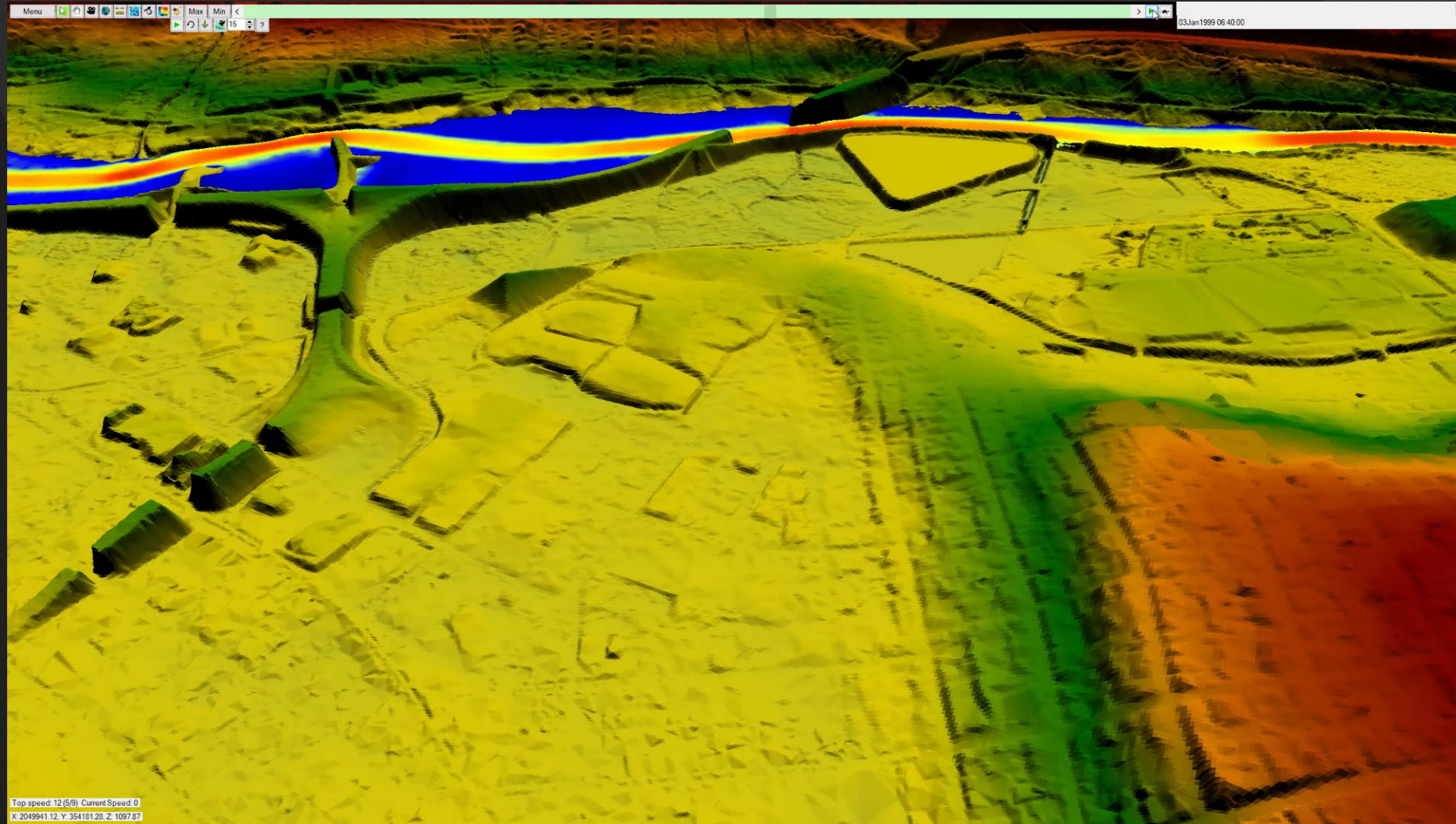
0006          Hour = 0.0
0010          H4 Integer = 0.0
0013          Minute = 0.0
0019 True          0.0 = 0.0 AND 0.0 = 0.0
```



RAS-Mapper



3D Viewer



Questions?