FY17 RSM IPR

Fall Creek Flush Model

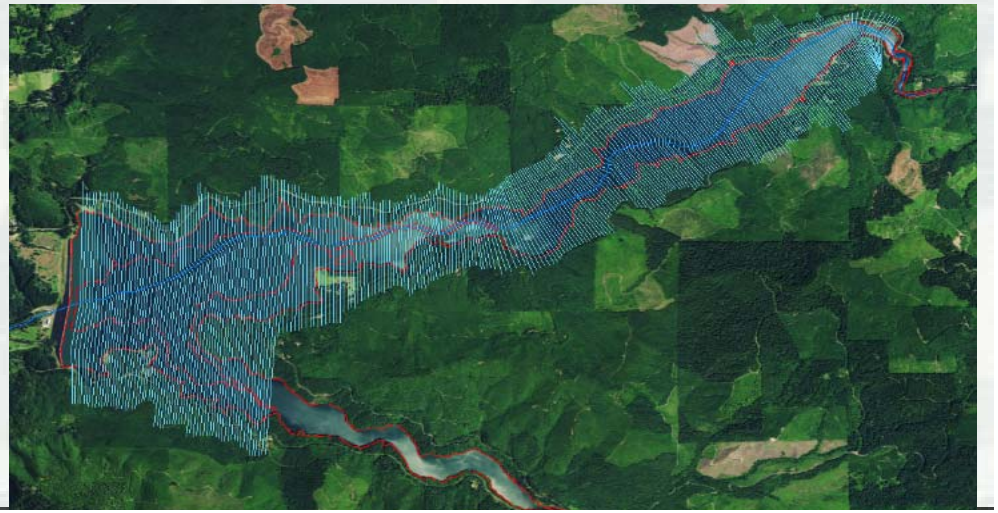
BLUF: NWP and HEC developed HEC-RAS sediment model of the only regular USACE reservoir flushing operation, calibrating the model to three years and adding new HEC-RAS features.

Objectives

- Calibrate a sediment model of the Fall Creek flush.

Approach

- Developed an HEC-RAS 5.0.3 model of three historic flushing events at Fall Creek, calibrating them to downstream concentration.
- Developed several different models utilizing different modeling approaches.



FY17 RSM IPR

Fall Creek Flush Model

District/Other USACE PDT Members

Jim Crain - NWP
Stanford Gibson - HEC
Ilya Poluektov – NWO
Jarrod Norton – NWP
Chris Nygaard – NWP

Stakeholders and Partners

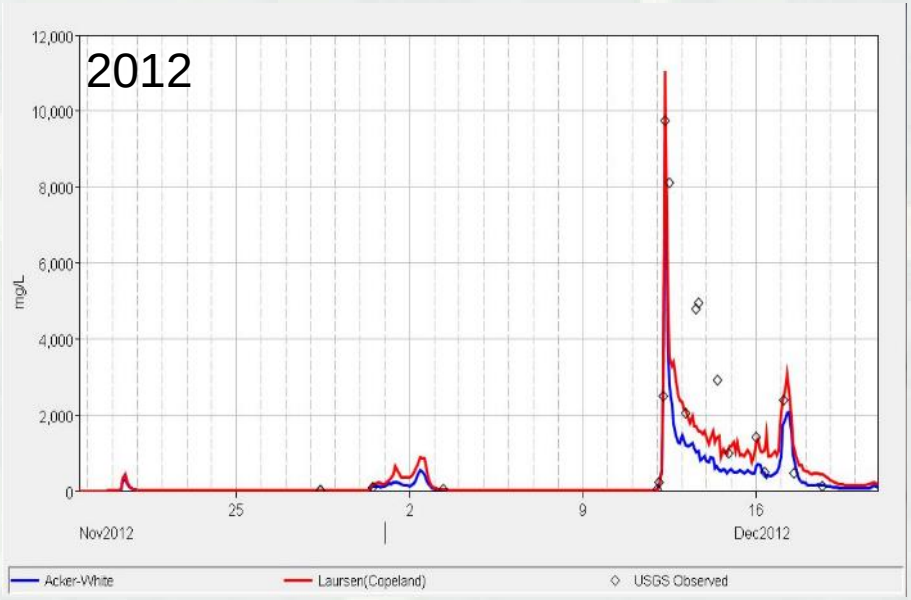
Greg Taylor, NWP
USGS

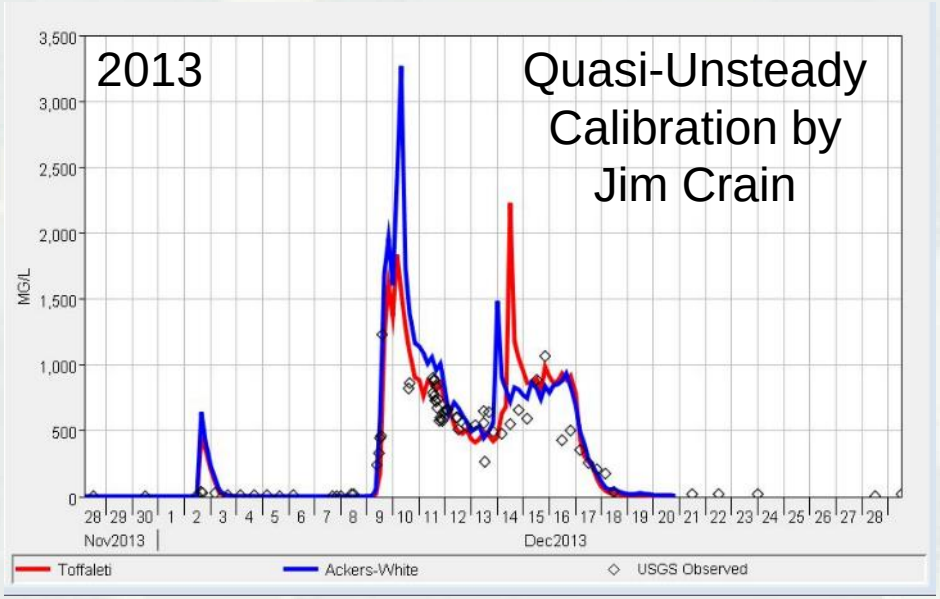
Leveraging/Collaborative Opportunities

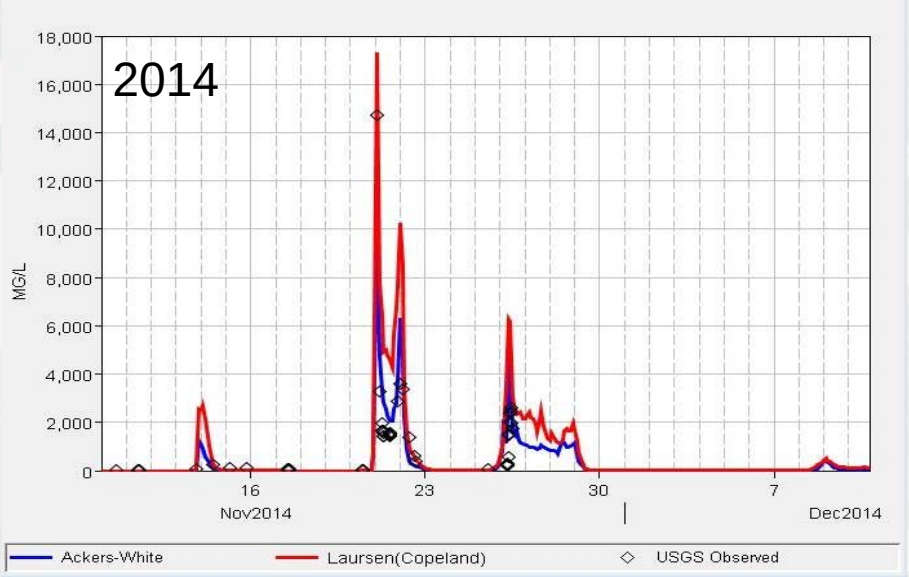
Leveraging development of HEC-RAS from the Flood and Coastal R&D Program

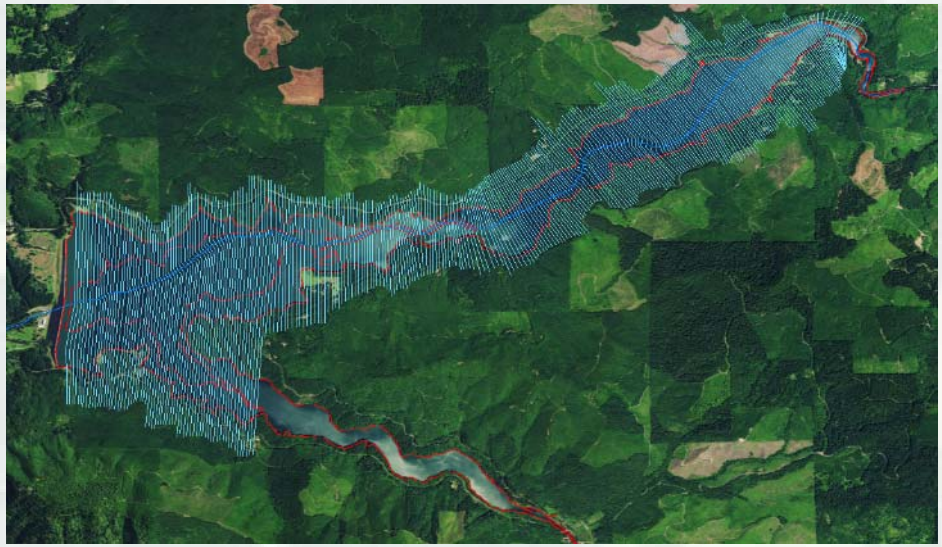
FY17 RSM IPR: Fall Creek Flush Model

Classic Quasi-Unsteady Calibration



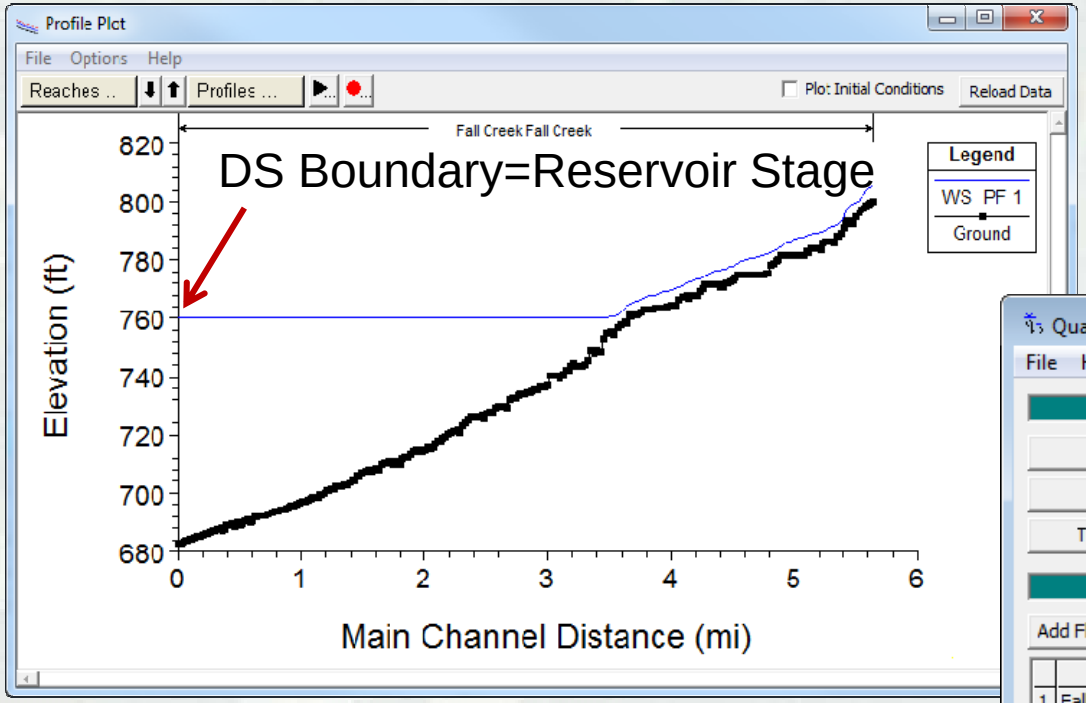


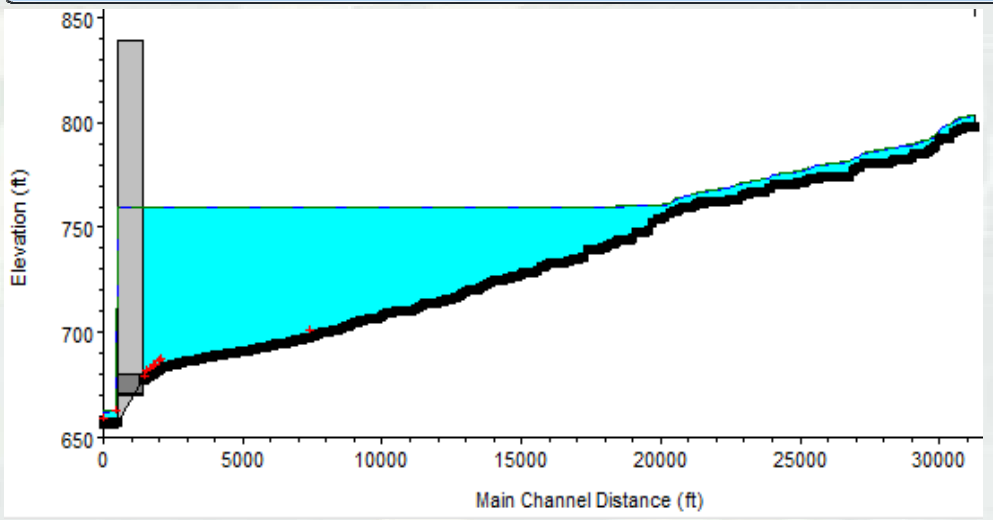


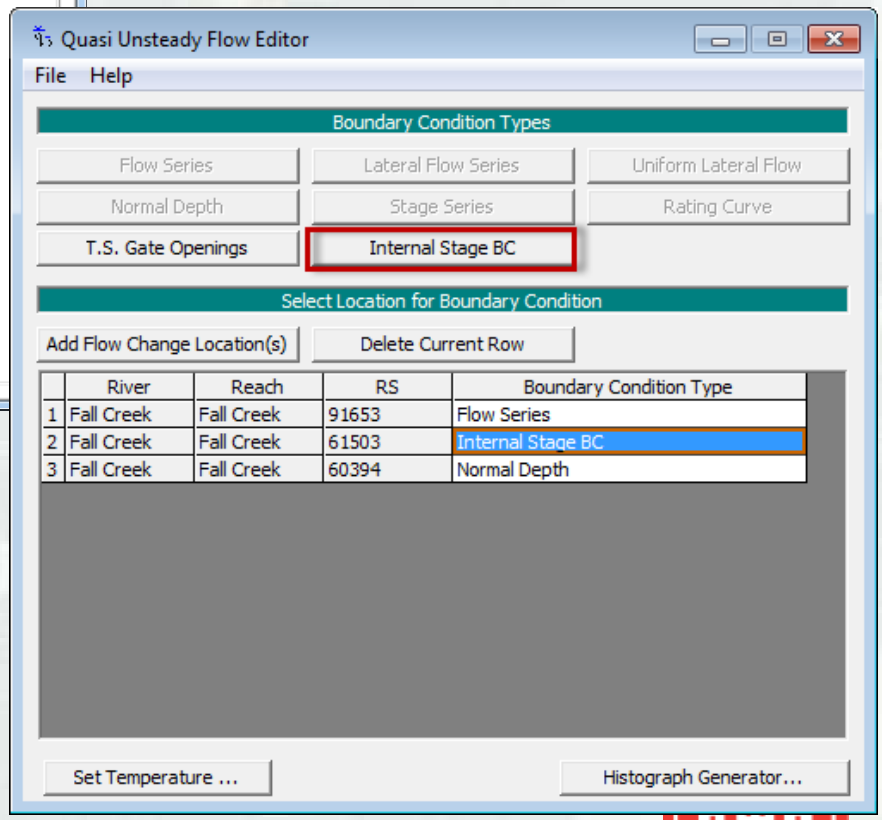


FY17 RSM IPR: Fall Creek Flush Model

New Feature: Internal Quasi Dam

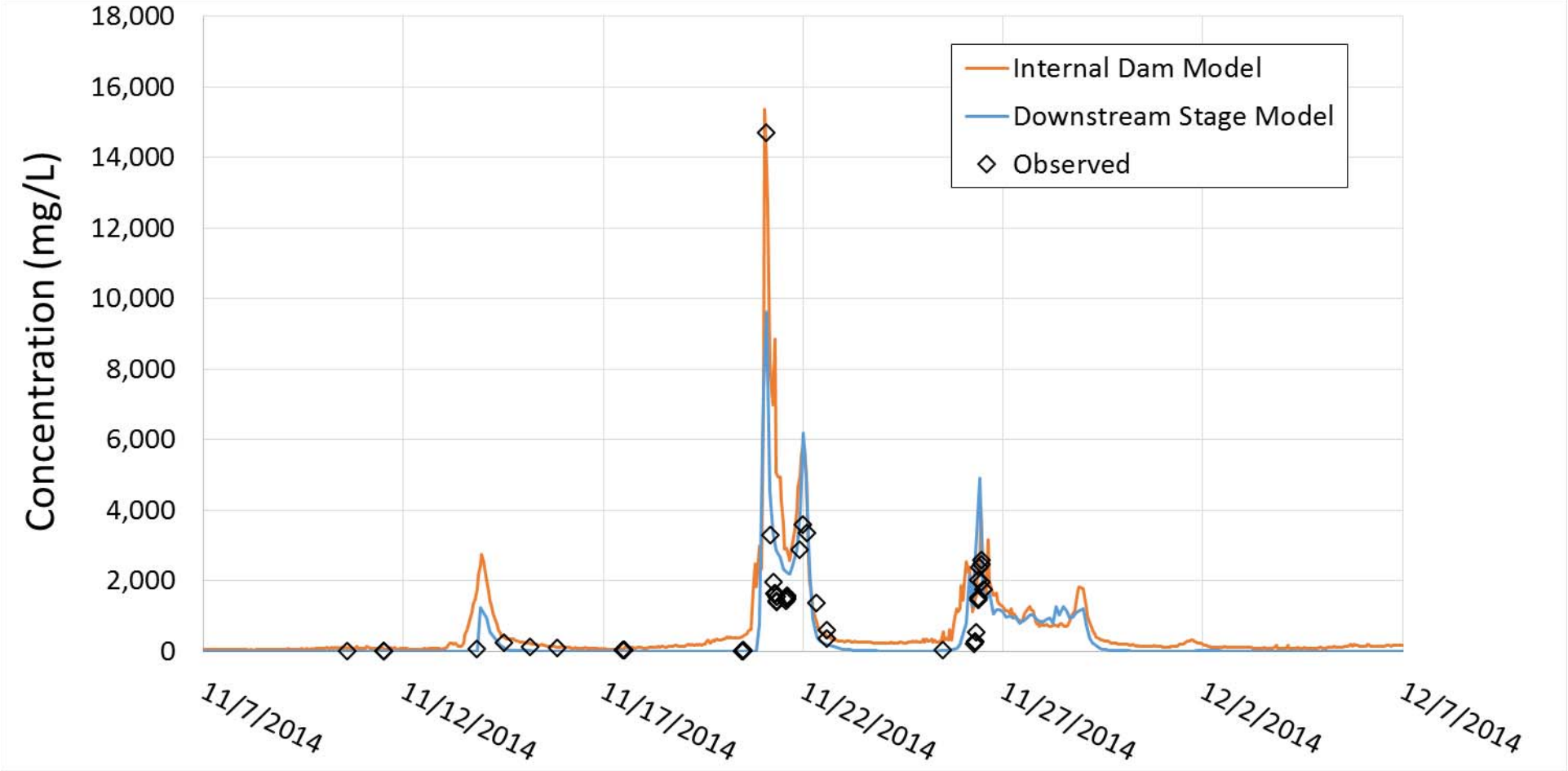






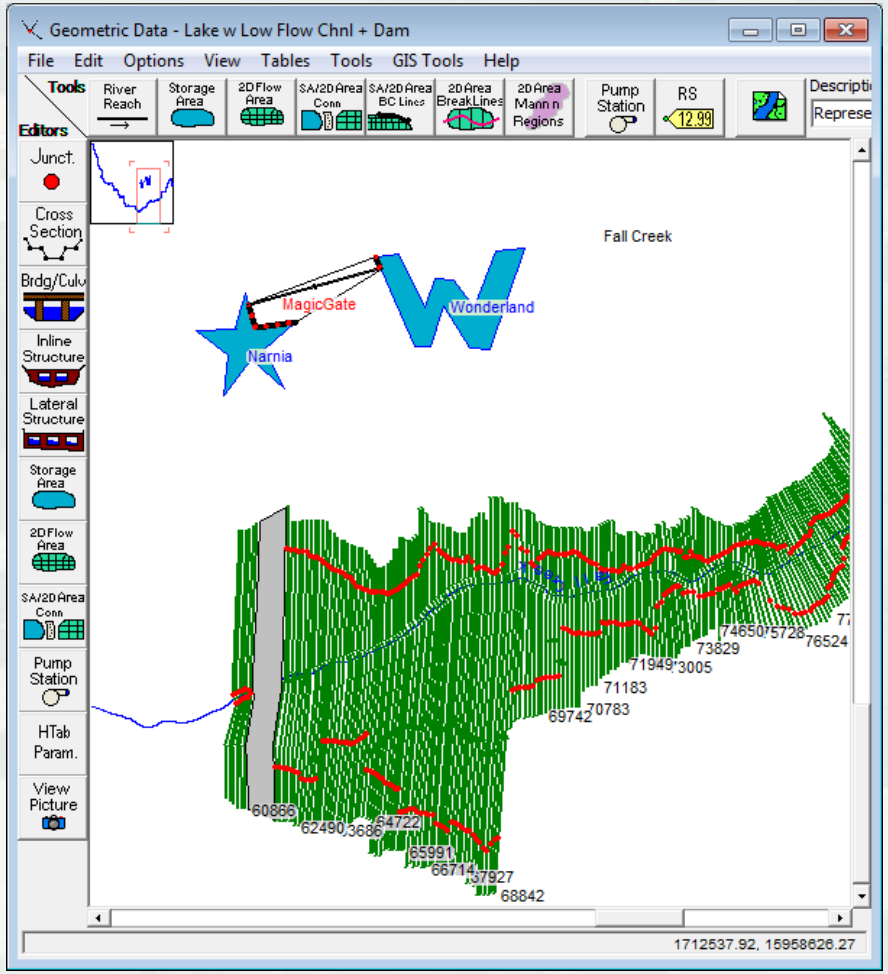
FY17 RSM IPR: Fall Creek Flush Model

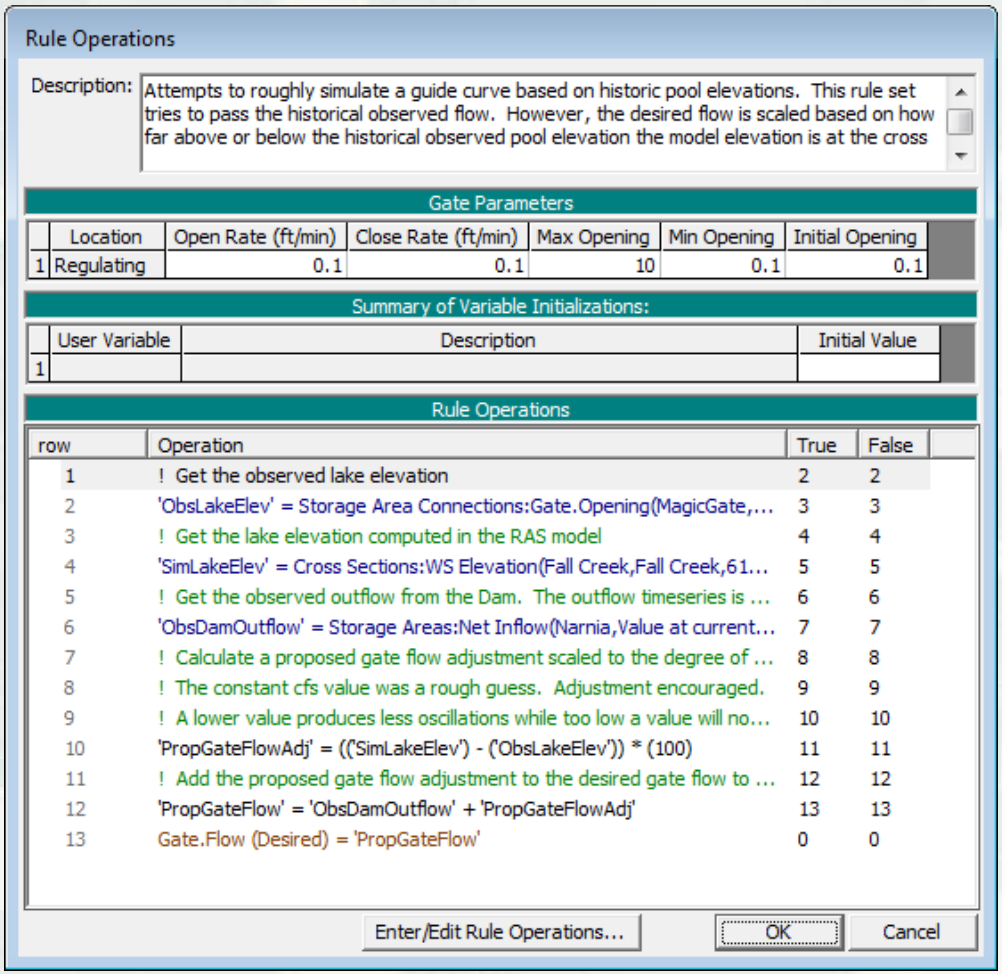
New Feature: Internal Quasi Dam



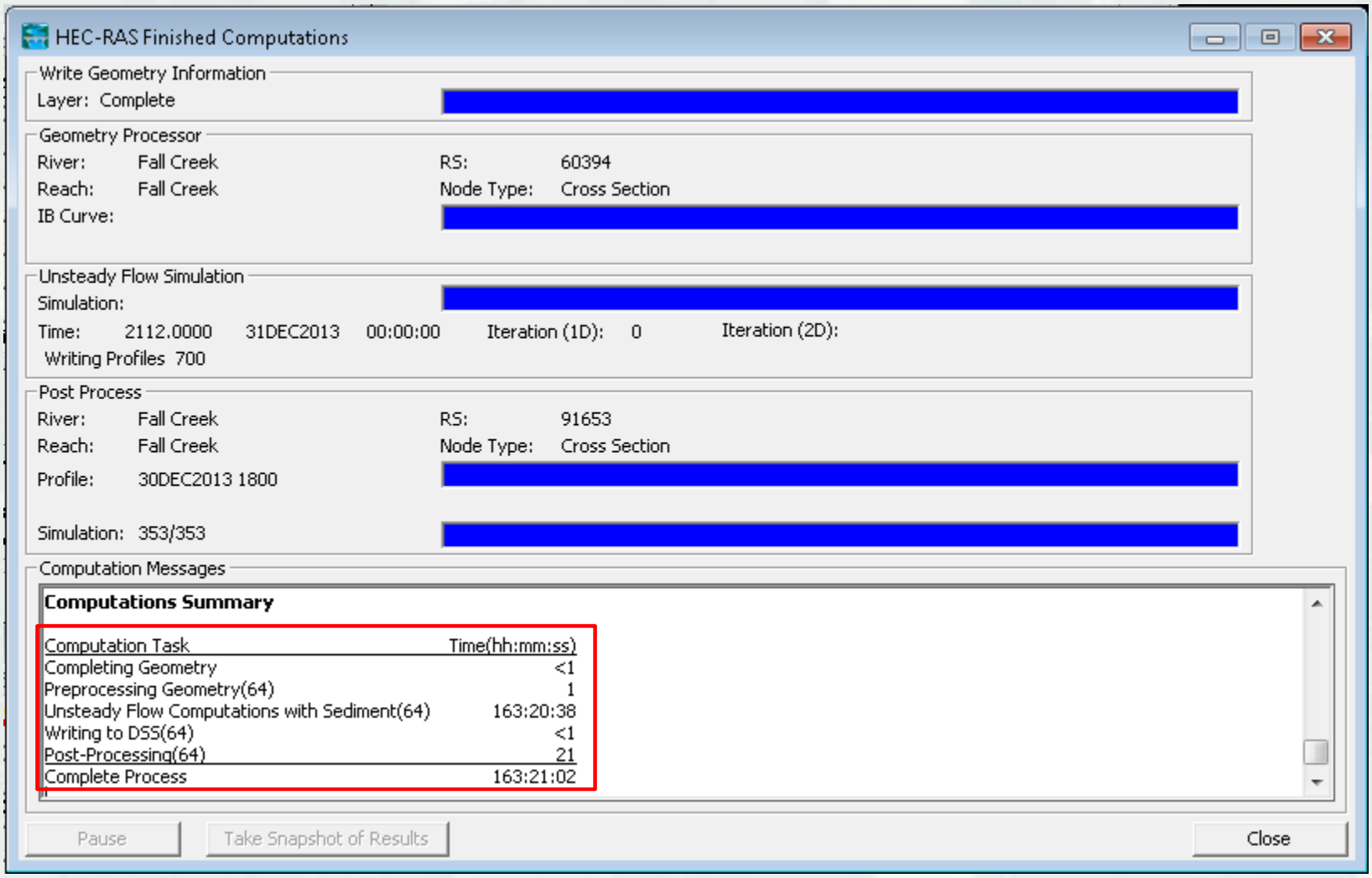
FY17 RSM IPR: Fall Creek Flush Model

New Feature: The Unsteady Model with "Rules"





New Feature: The Unsteady Model with "Rules"



What is working? Ups? Success?

The quasi-unsteady models. Good calibration for all three flushing events.

What is not working? Downs? Issues?

Unsteady sediment in steep slopes and rapid drawdown → 5 day run time

→ 1D Finite Volume and Variable Time Step Features will improve the unsteady performance.

How is this project benefiting the USACE and Nation

The Fall Creek model can help evaluate future flush alternatives and demonstrates the viability of predictive 1D models of reservoir flushing events.

As the USACE imagines future sustainable sediment management alternatives (including flushing operations), a model of our only regular flush demonstrates the sort of predictive analyses that could support these alternatives.

Software developments to HEC-RAS targeted to improve flushing analysis will improve USACE predictions of proposed, sustainable, sediment solutions.