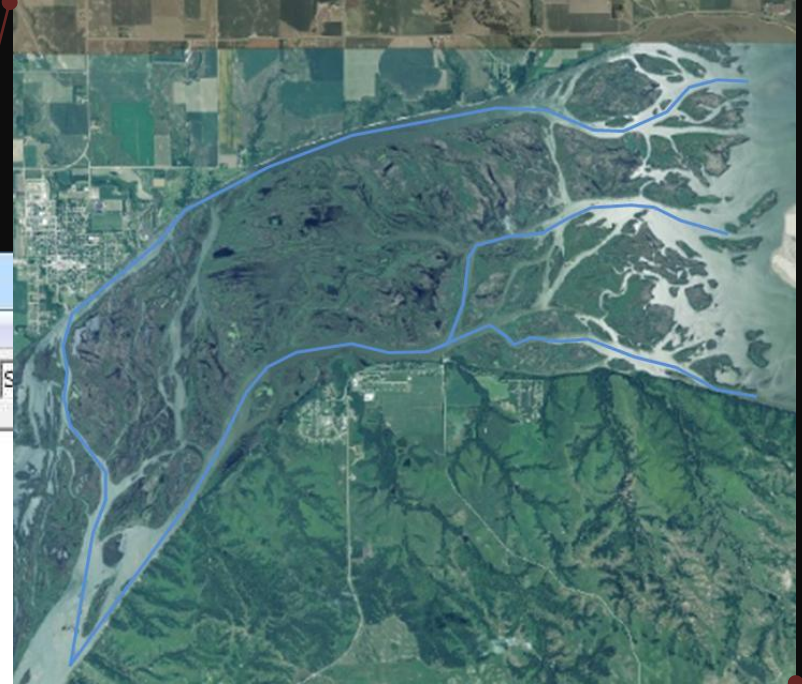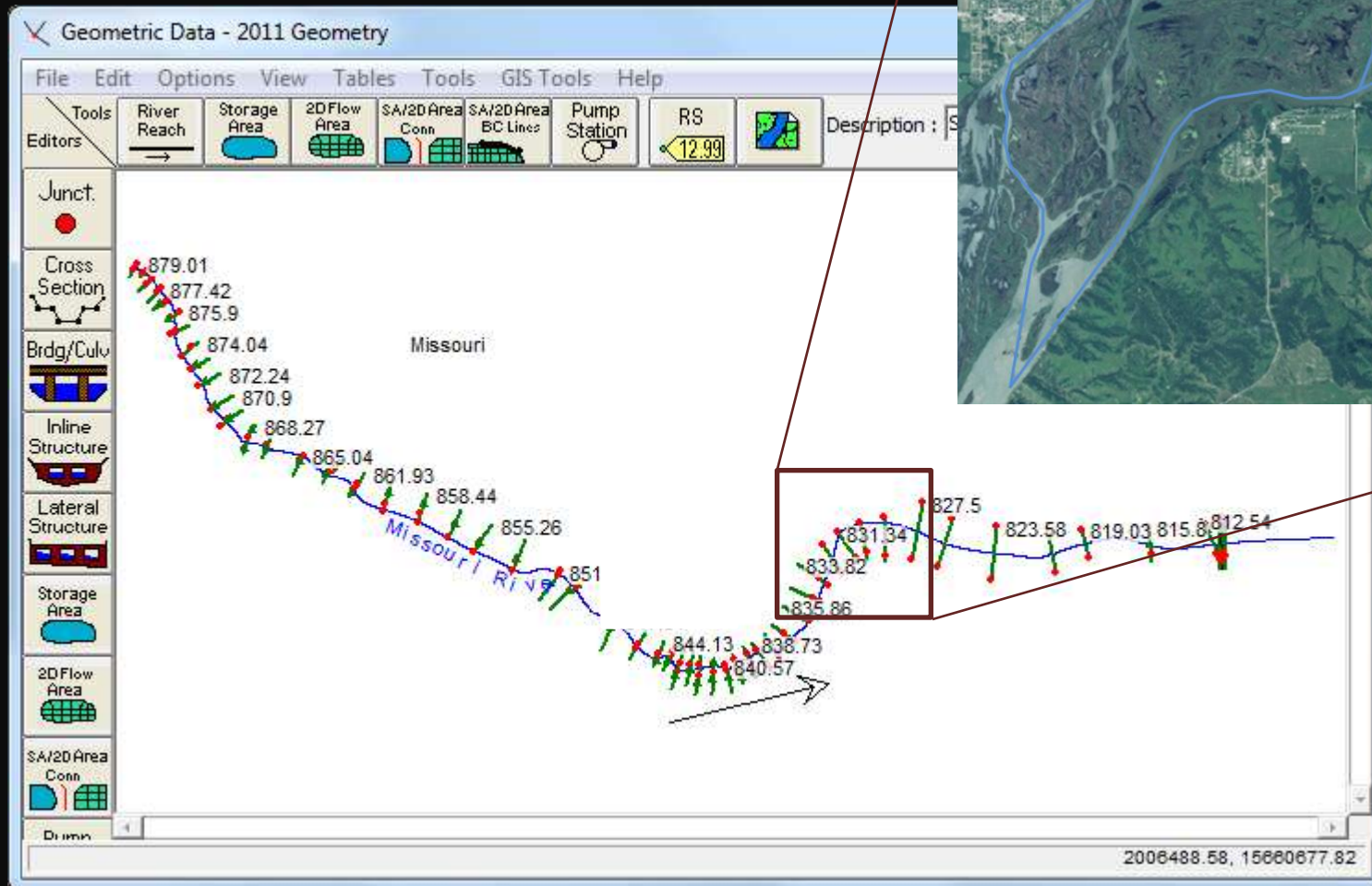# Sediment eFlows

Stanford Gibson, PhD
Hydrologic Engineering Center

Three Categories of Sediment
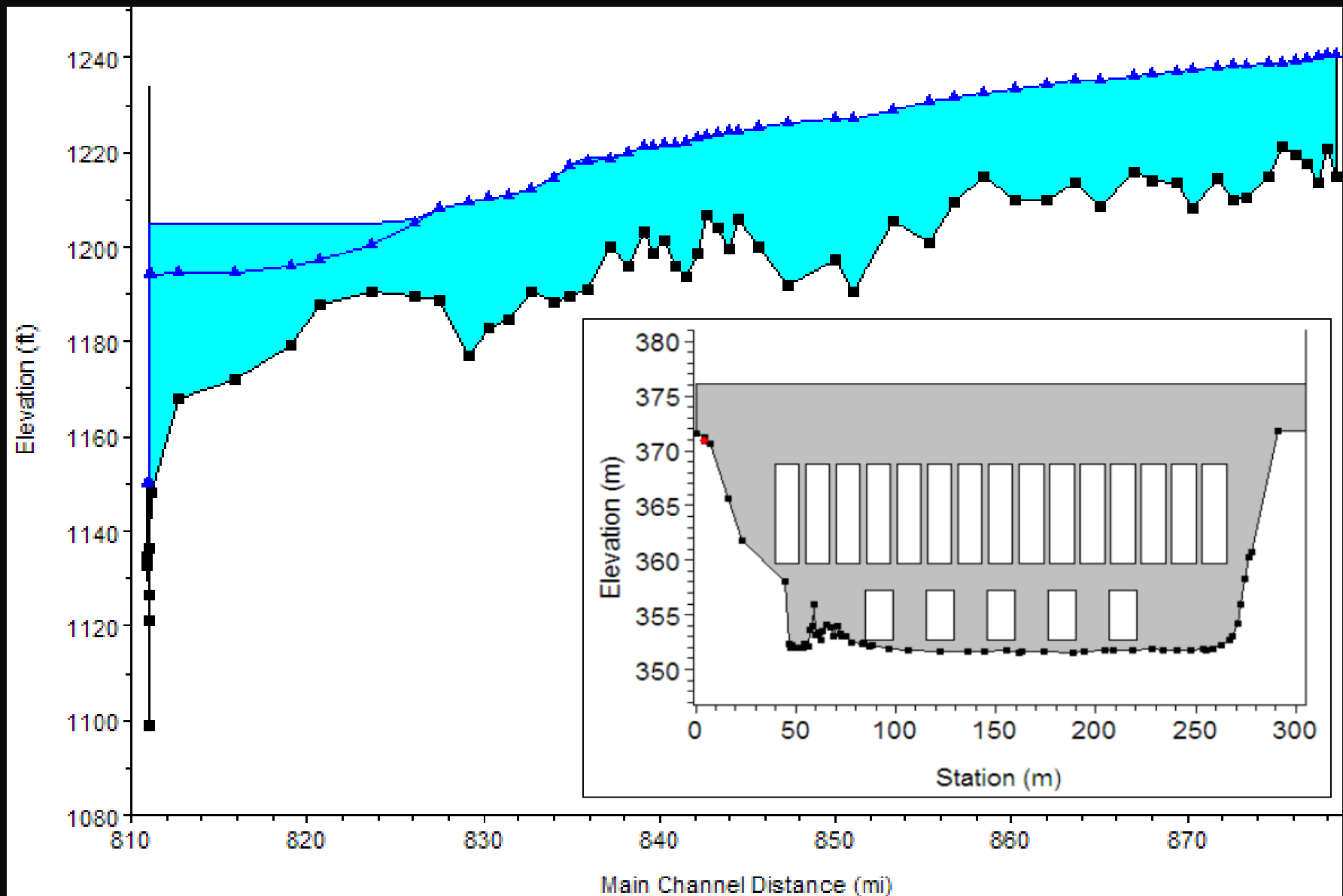# eFlow Modeling Problems

1. Operating for More Sediment

2. Operating for Less Sediment

3. Operating to Move Existing Sediment Around

More Sediment

Lewis and Clark Flushing Model

HEC-RAS Unsteady Model

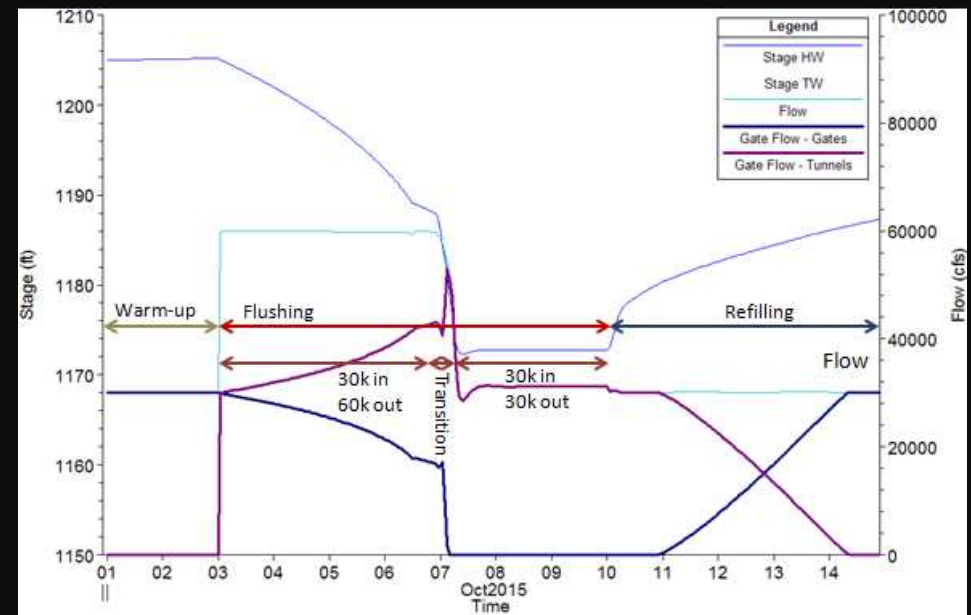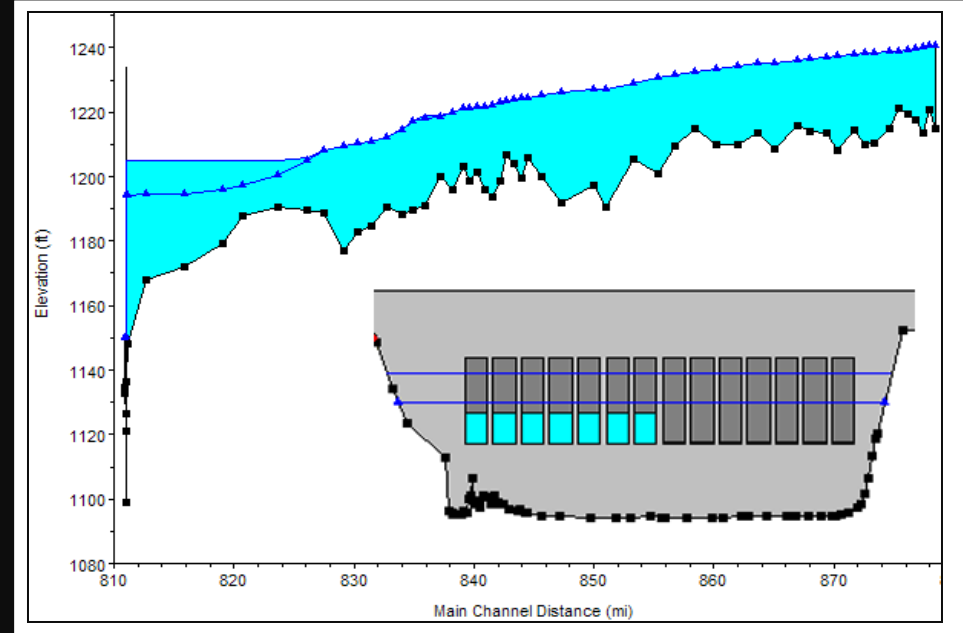# Sluicing – Lewis and Clark Reservoir

Implement unsteady sediment transport in HEC-RAS including operational rules.



```
2    'Pool Stage' = Cross Sections:WS Elevation(Missouri River,Missouri,811.076
3    'RunTime' = Time:Hour of Simulation(Beginning of time step)   Get Sim Value
4    !
5    !
6    Structure.Total Flow (Desired) = 60000    Set Operational Param
7    !
8    ! Start to fill after 11 total days of run time   Comment
9    If ('RunTime' > 246) And ('Pool Stage' < 1205) Then
10       Structure.Total Flow (Desired) = 5000
11   ElseIf ('RunTime' > 246) And ('Pool Stage' >= 1205) Then   Branch (If/Else)
12       Structure.Total Flow (Desired) = 30000
13   End If
```

Allows complex, automatic, sediment reservoir modeling.

Reservoirs can now be included as part of regional sediment system models

Sluicing – Lewis and Clark Reservoir
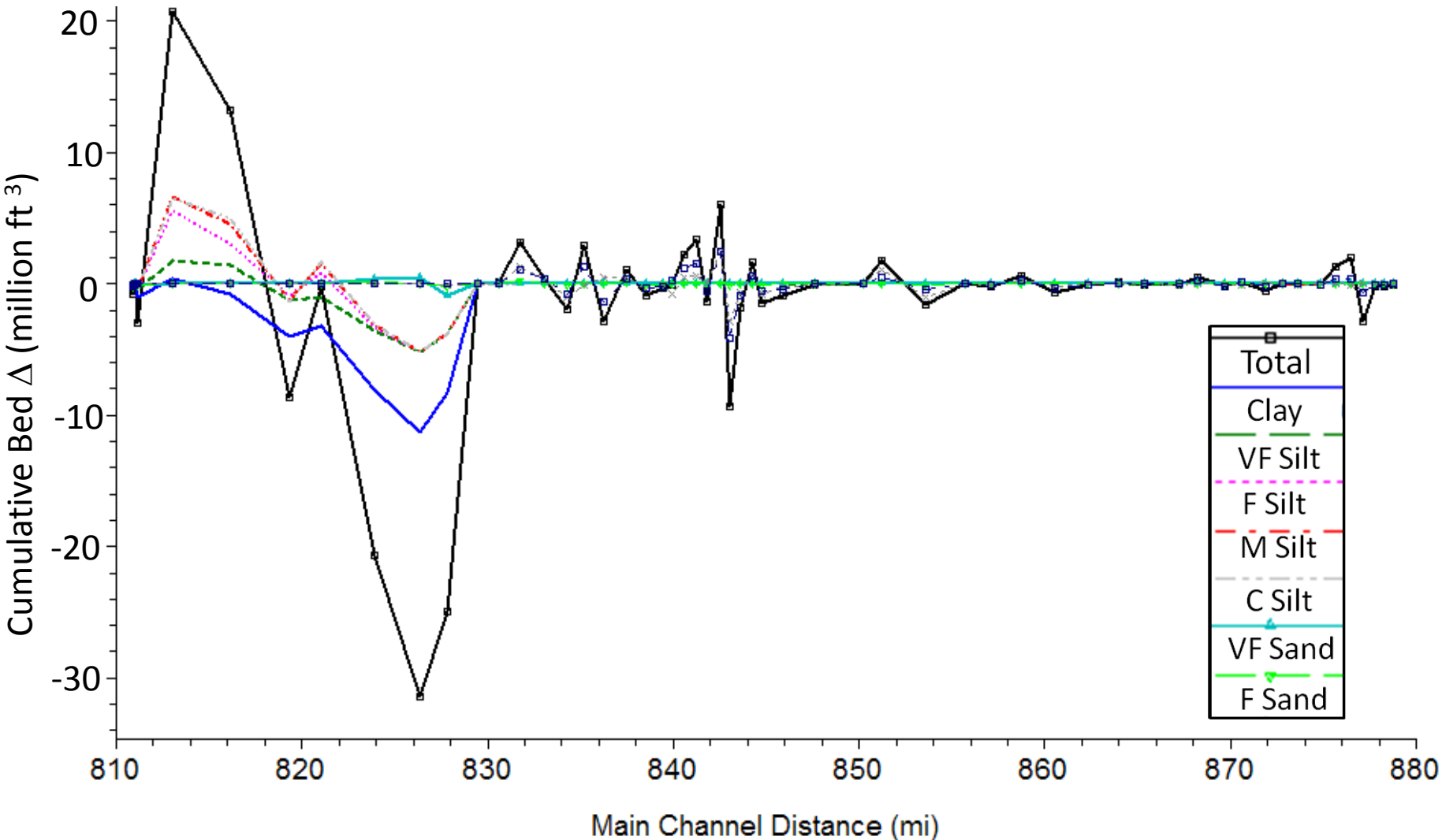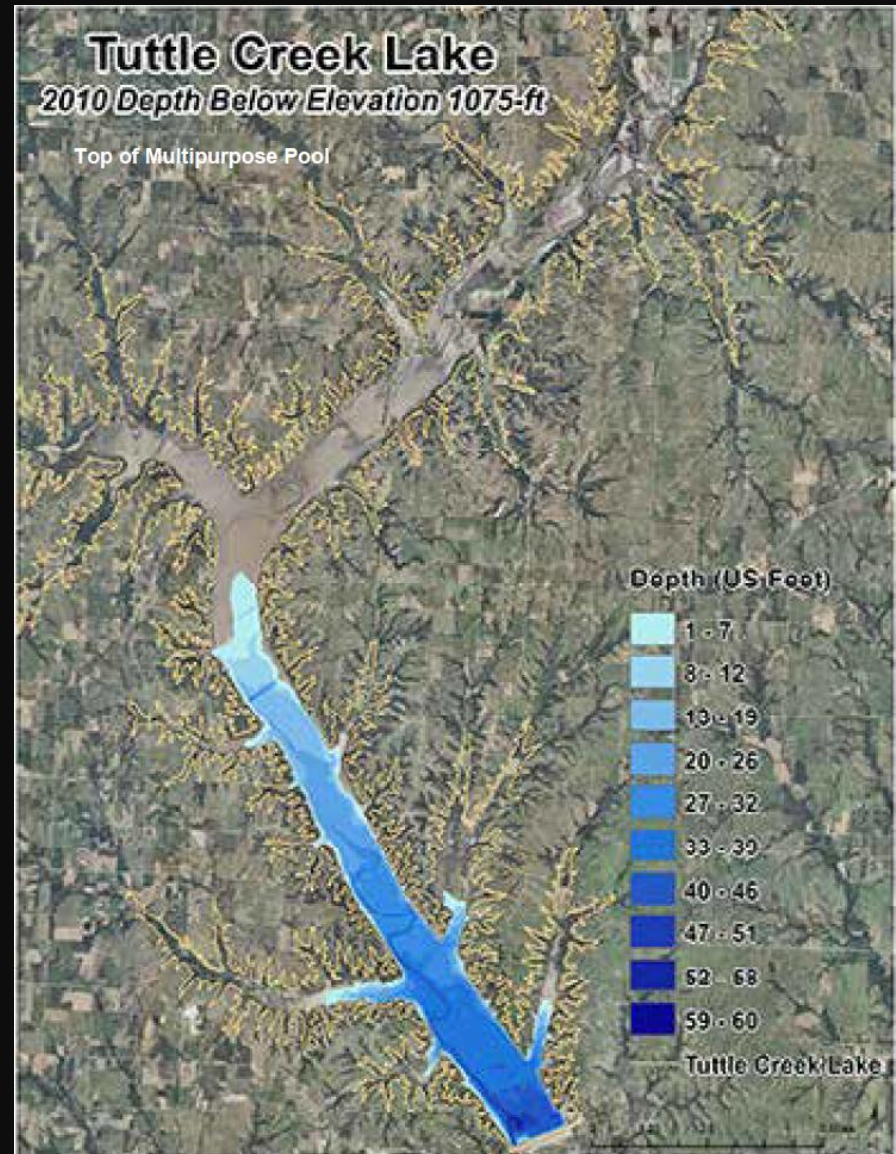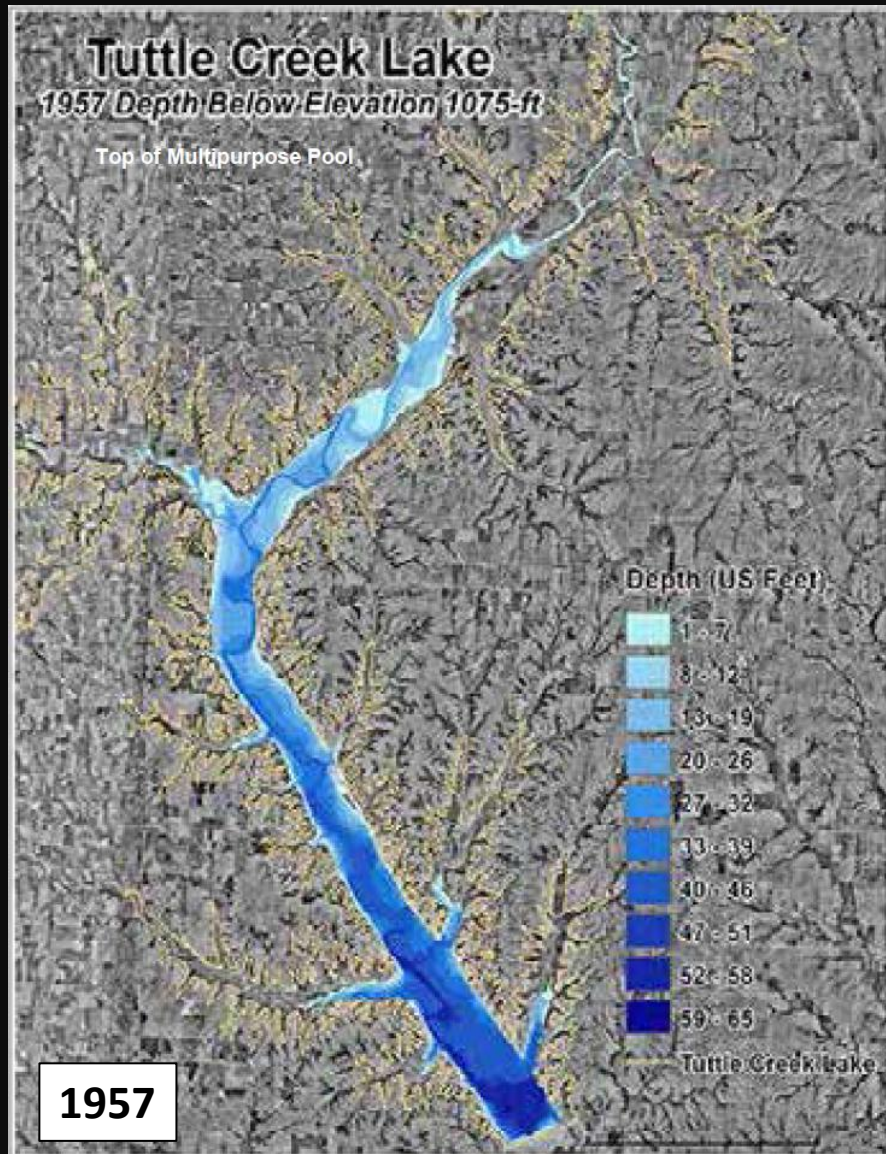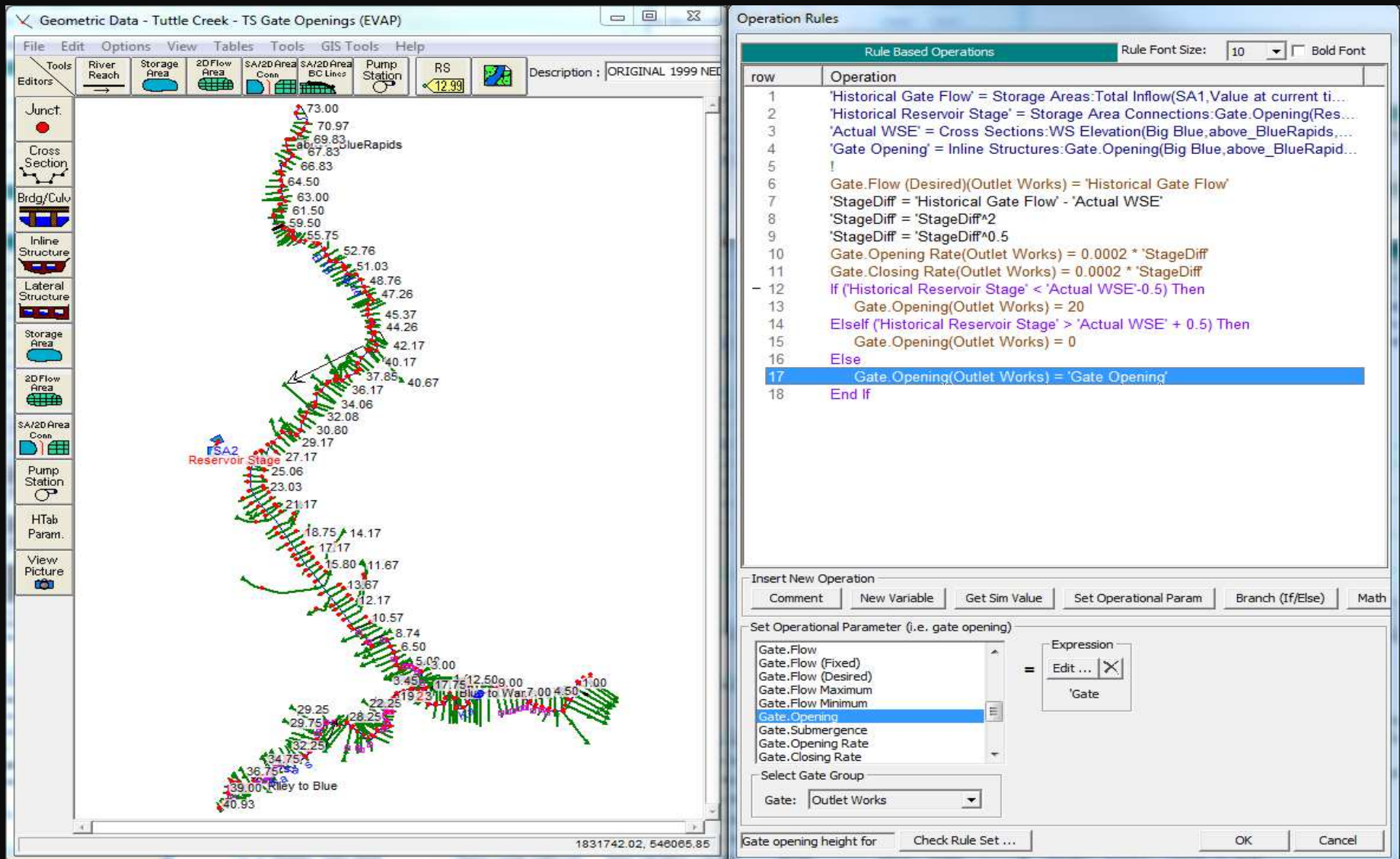
Spencer Reservoir Validation

Less Sediment

Reservoir Management
Flushing – Tuttle Creek Reservoir

1957

Tuttle Creek Sediment Routing Model

Operating on Sediment Variables

Rearrange Sediment

Missouri Sediment Model

ESH GIS Toolbox

Legend:
- gav05jul06_sandbar_ESHW (yellow)
- gav18jul06_all_ESHW (red)
- gav12may06_sandbar_ESHW (blue)
- gav30may06_sandbar_ESHW (magenta)