HEC-RAS Mapper
Results Visualization
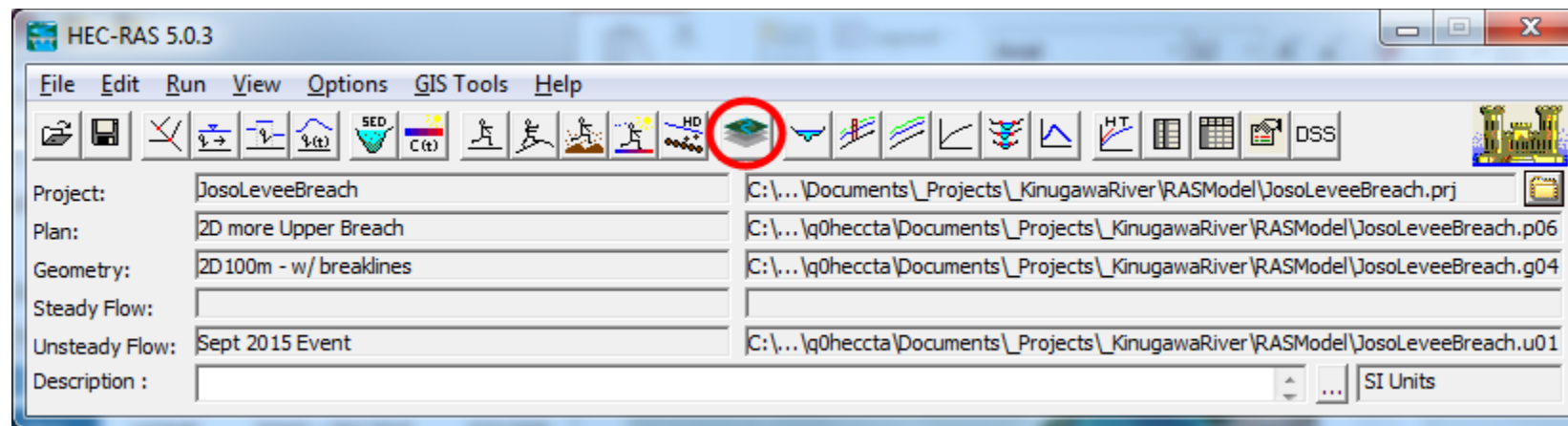
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Cameron Ackerman, P.E., D.WRE

USACE, Institute for Water Resources, Hydrologic Engineering Center

Overview

- How do we visualize RAS results?

- How do we debug our model?

- How do we compare different plans?

HEC-RAS Mapper

Layers List

- Profile Lines

- Geometries

- Results

- Map Layers

- Terrains

Selected Layer: Depth

Symbology is shown to the right of any checked layers.

The selected layer is highlighted in magenta.

4

Status Area

- Messages – What just happened
- View – Quickly zoom to predefined areas
- Profile Lines – Access results at specific locations
- Active Features – Quick access to features in layer
- Layer Values – Watch values for multiple results

Geometry 'Imported GIS Data +Bridges' association was set to the one terrain available (Terrain)
XS Interpolation Surfaces generated in 167 ms

Airport
Confluence
WWTP
Santa Fe Ave Bridge

US End of Levee
Left Split
Right Split
Cross Section

15696.24
15485.51
15370.43

Use	Name	ID	Value
☑	Velocity (250ft+Refinement)	vR	1.51
☑	Velocity (250ft+Breaklines)	vBL	1.40
☑	WSE (250ft+Refinement)	wR	573.71
☑	WSE (250ft+Breaklines)	wBL	575.43

Messages | Views | Profile Lines | Active Features | **Layer Values**

Profile Lines

- User-defined/editable features

Active Features

Watch Layer Values

Web Imagery

Plot Options

- Terrain

- Depth, WSE

- River, Cross Sections
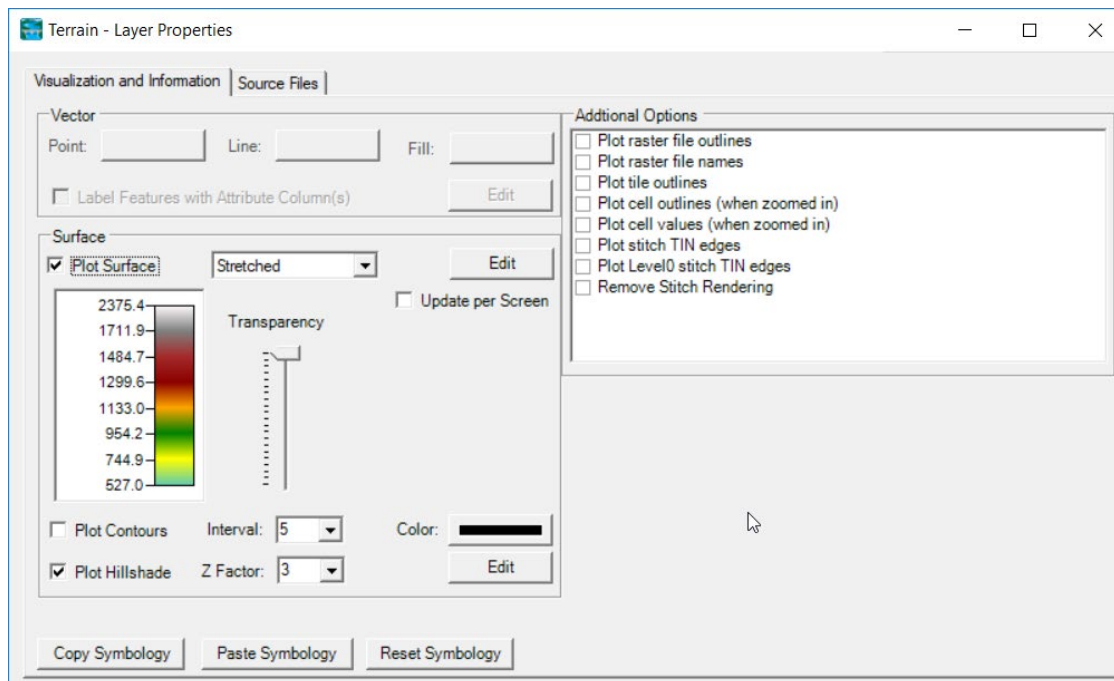
Results Mapping

- Dynamic Mapping – on-the-fly mapping
    - Animation of results without waiting
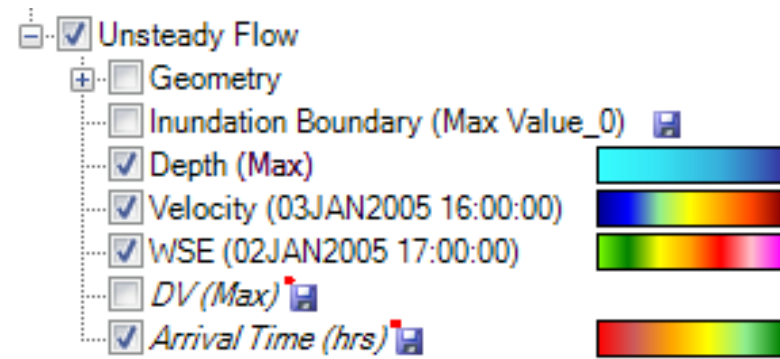
- Stored Maps – results written to file

✱ *= There was a problem reading data*

Results Mapping

Map Type | Profile/Parameter | Mode

Default maps: Depth, Water Surface Elevation, Velocity
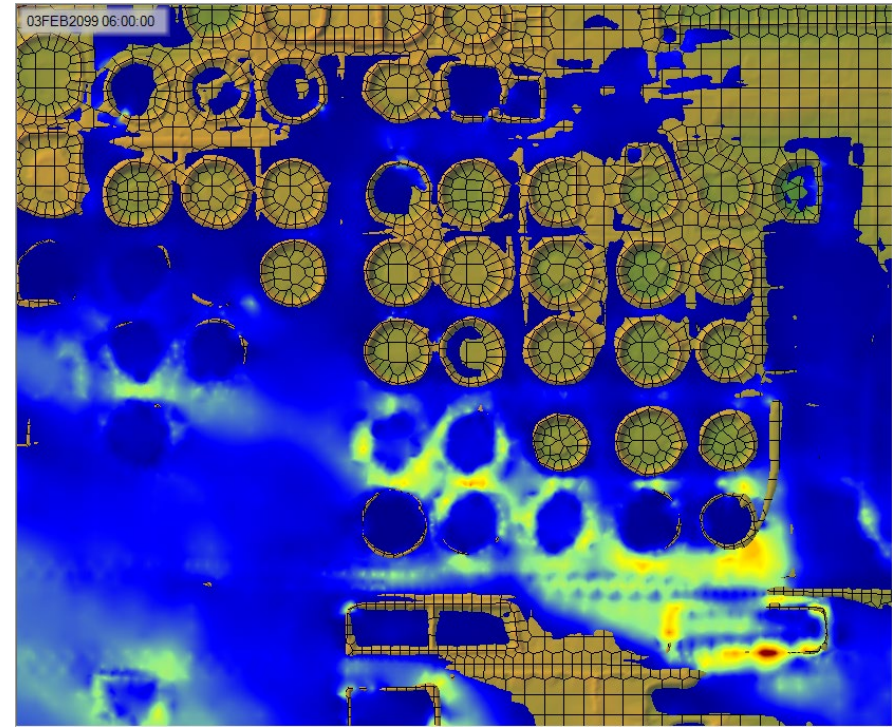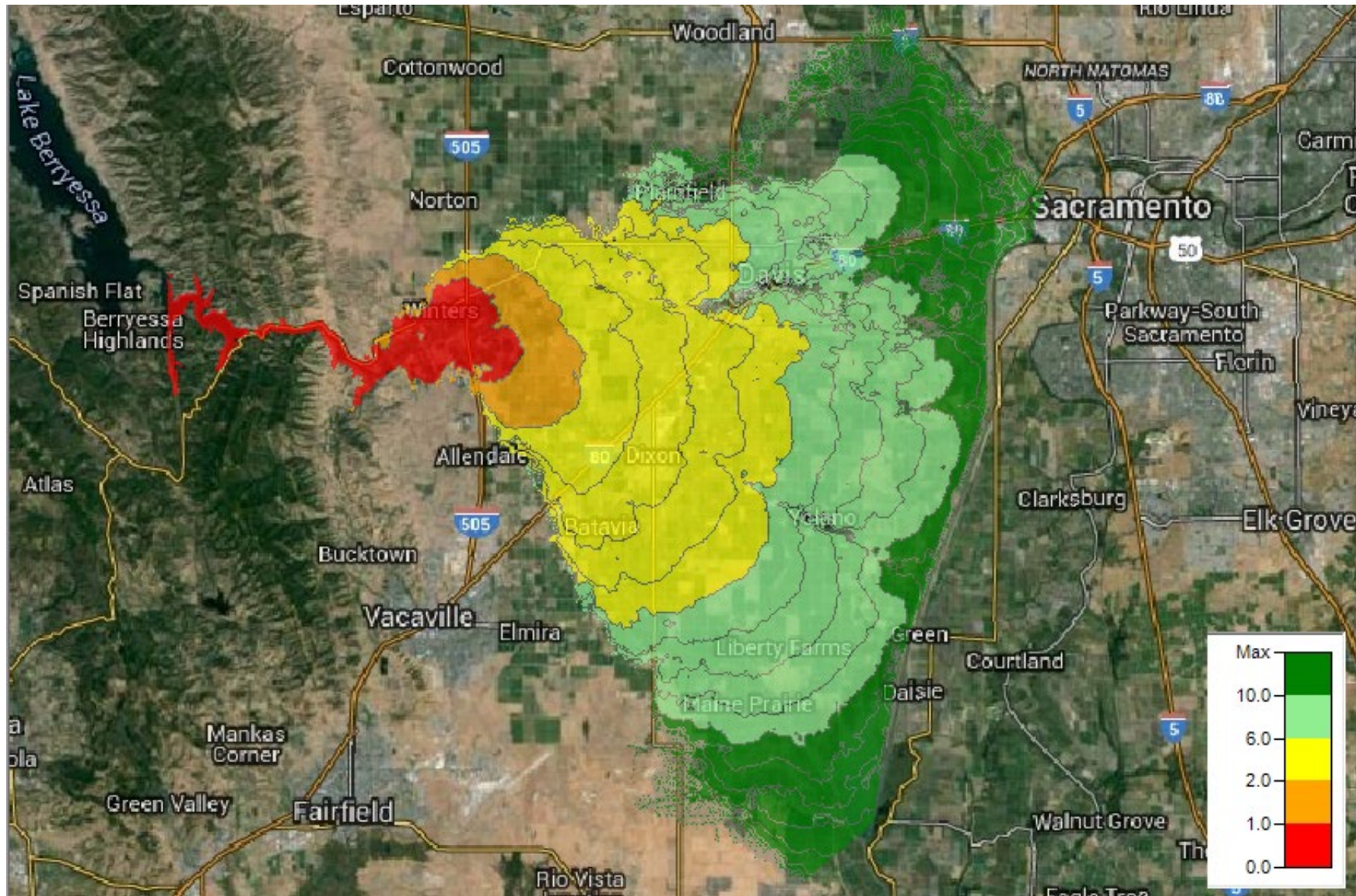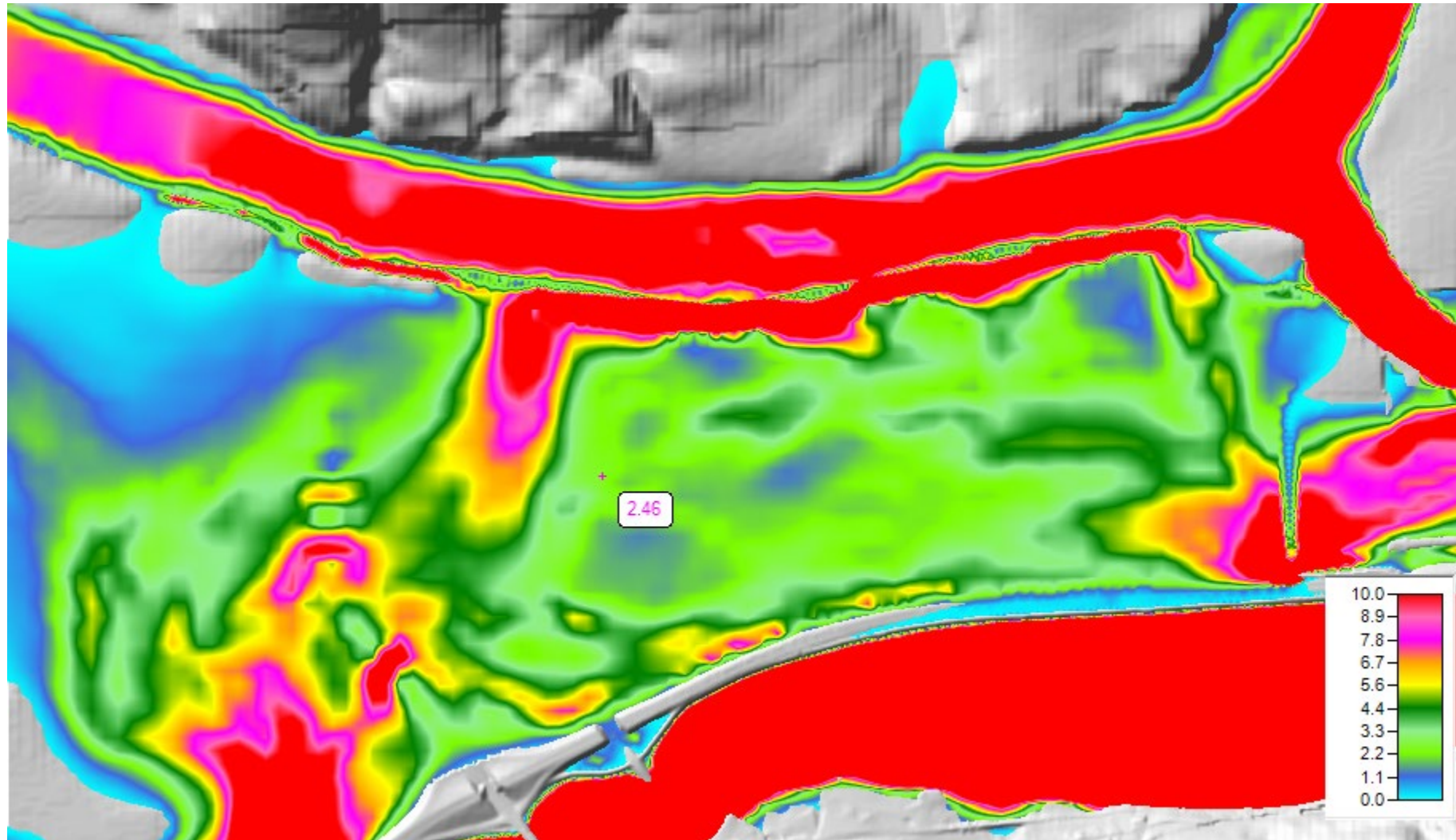
Example Maps

- Depth
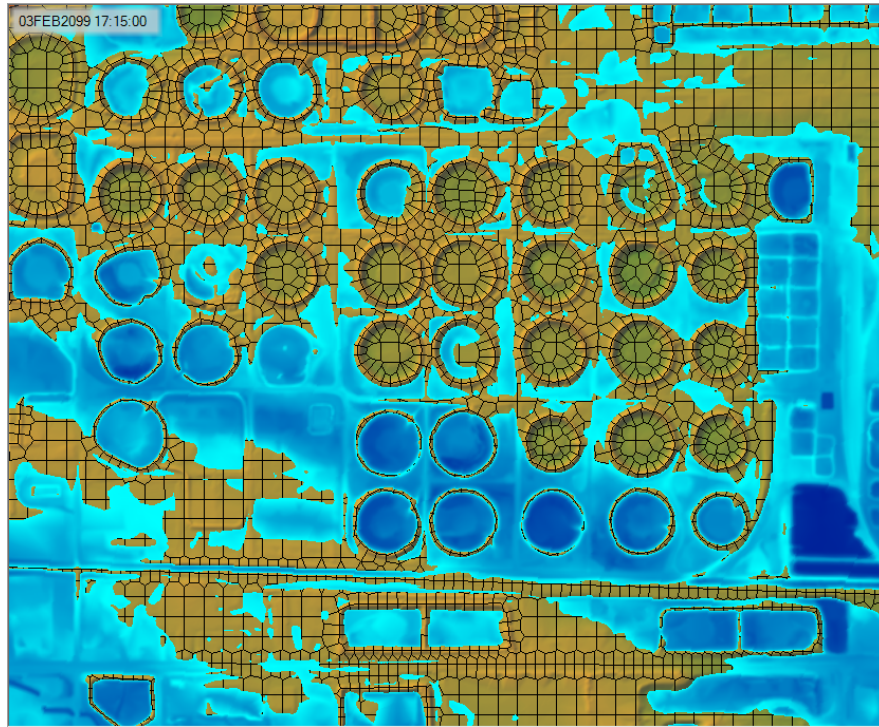
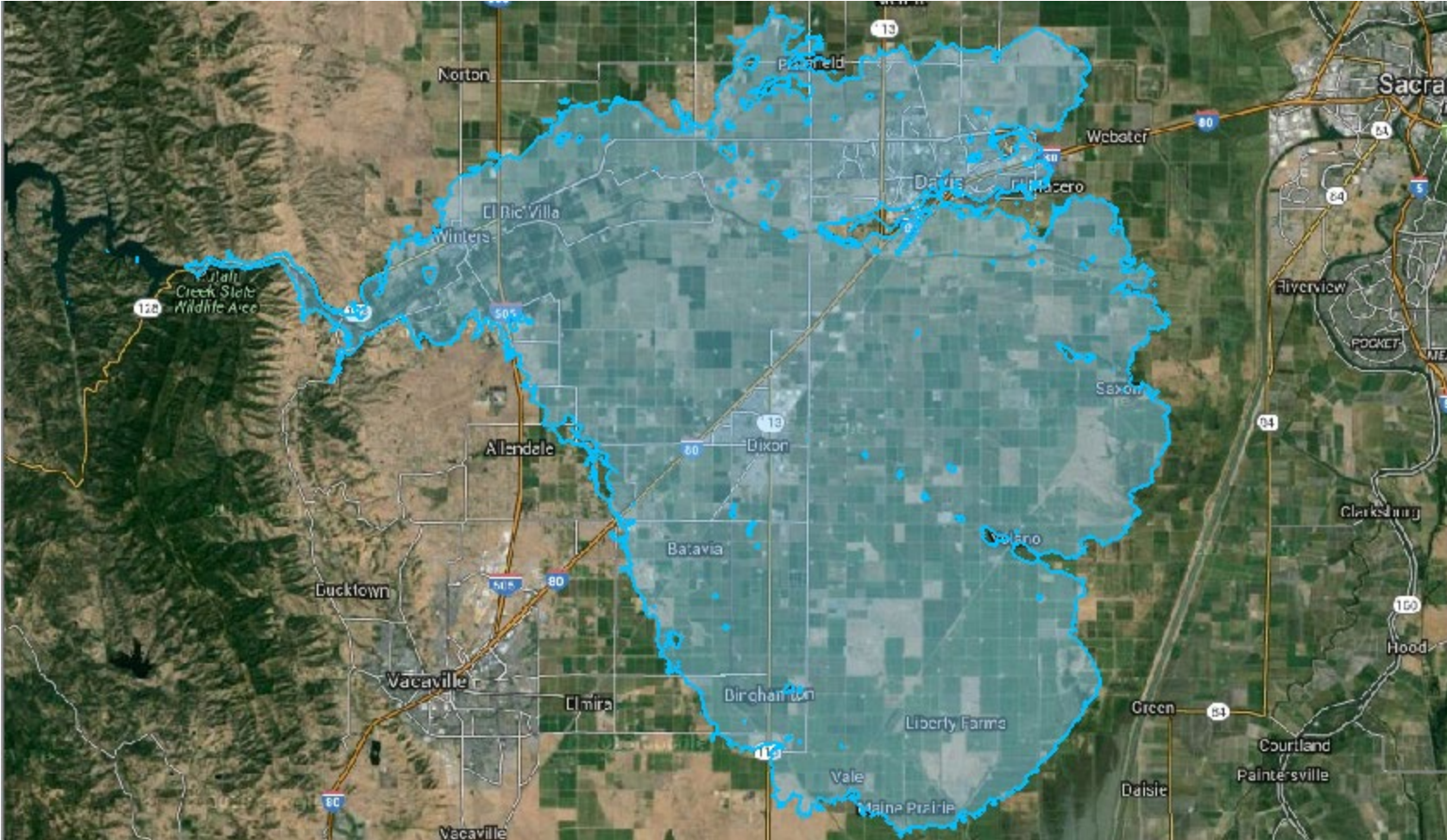- Velocity

Arrival Time

Hazard Mapping

Inundation Boundary

Map Types – Dynamic vs Stored

- Dynamic: Computed on-the-fly
  - Smooth: Computes to screen-resolution
  - Doesn't use disk space
- Stored: Computed to terrain resolution
  - Stored to disk
  - Faster rendering for slow map types
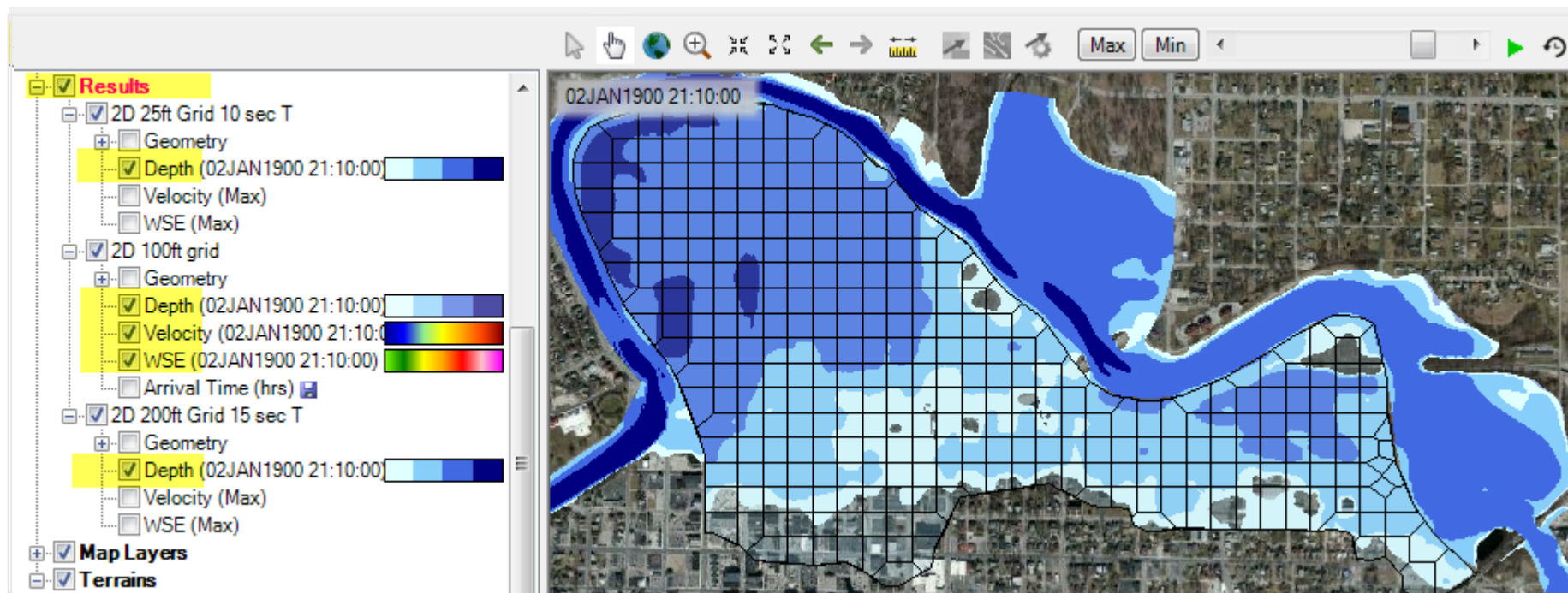
Dynamic vs Stored Results

- Dynamic results plot values for the current pyramid level. Boundaries are defined based on interpolation.

- Stored results have a single value per cell.
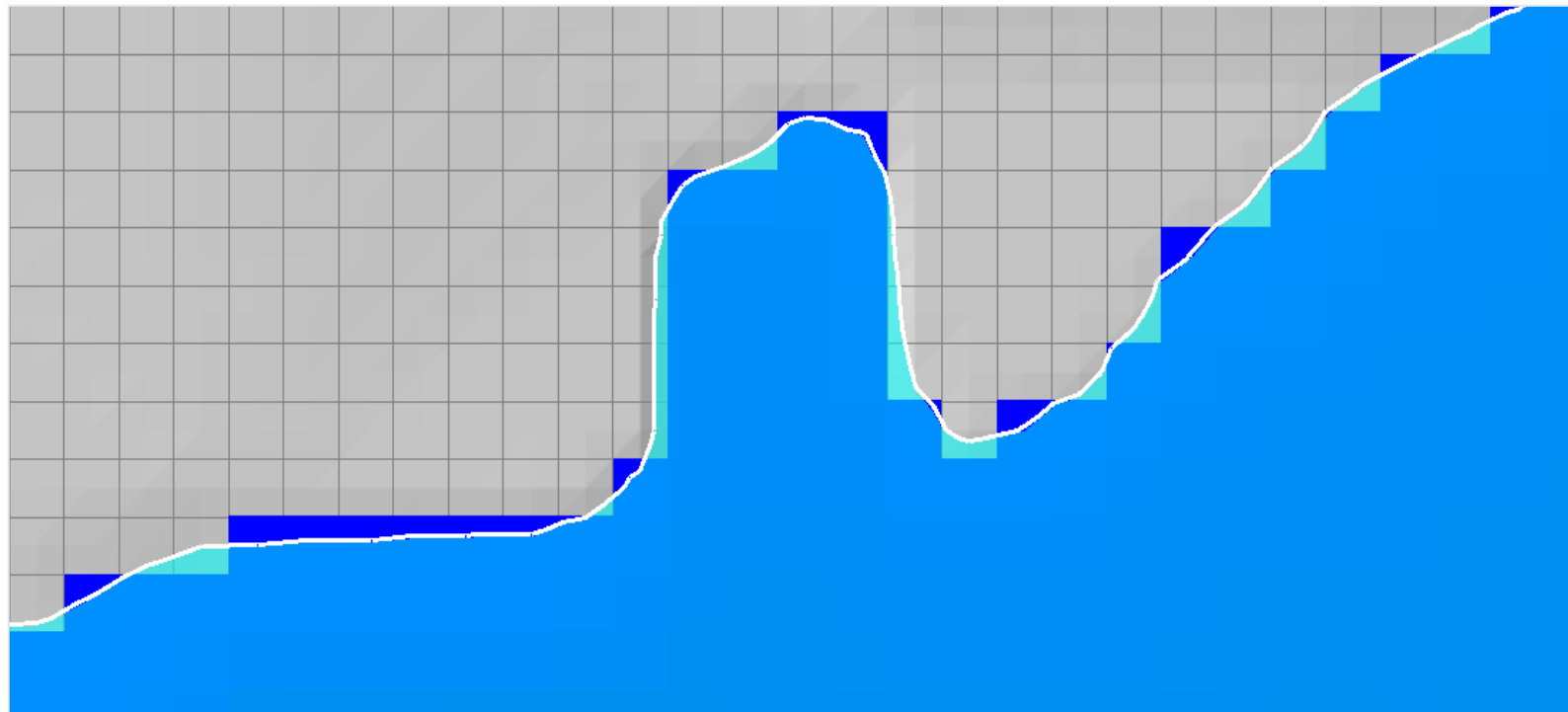
Dynamic Mapping

- Animation Toolbar – works on selected layer or group and syncs the timestep

Dynamic Mapping - Animation

02JAN1900 00:00:00

Calculated Layer

- RASter Calculator

- Custom scripting code to use multiple results

- Works with RAS Results and Terrains
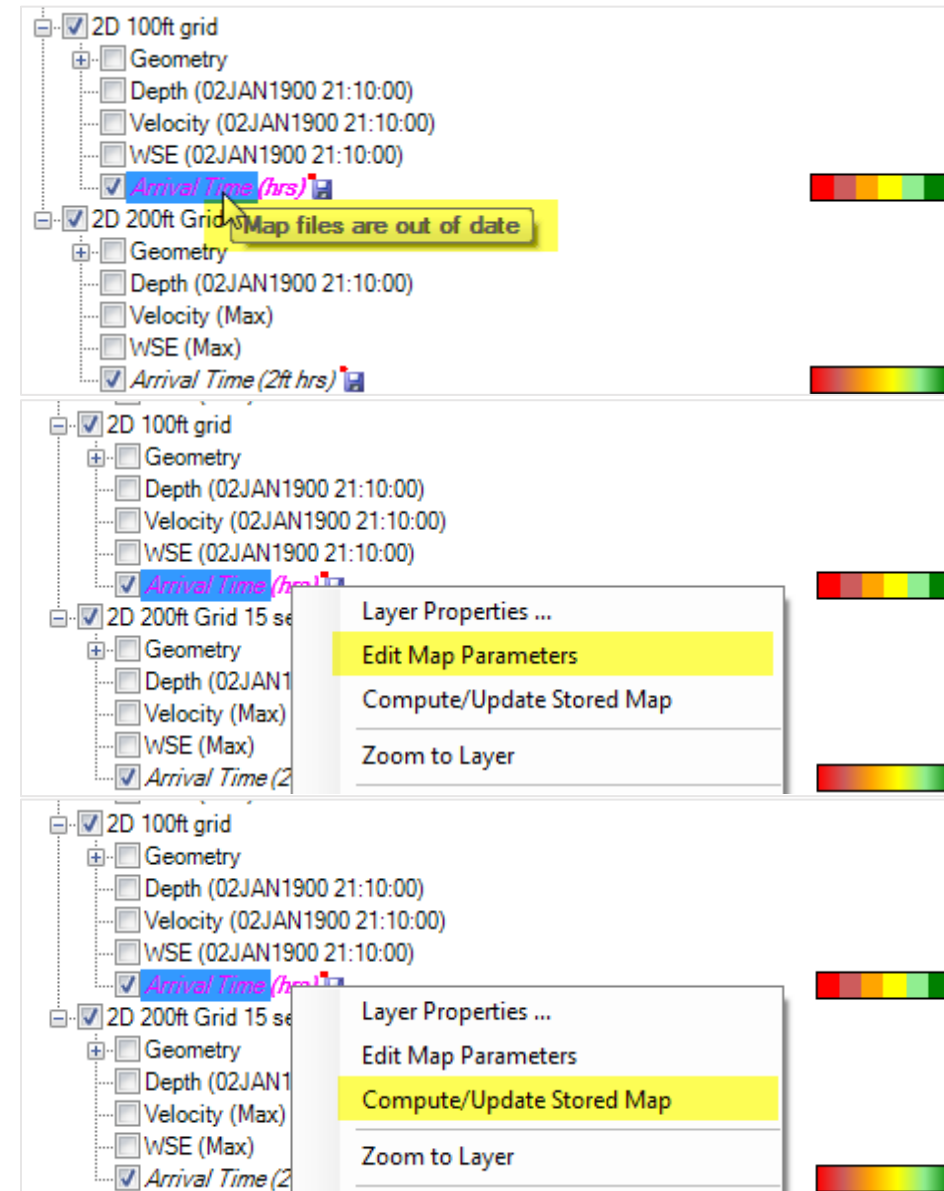
- Works with Rasters on disk

Stored Maps

Stored Maps

- Map status message on cursor tool tip

Right-click options:
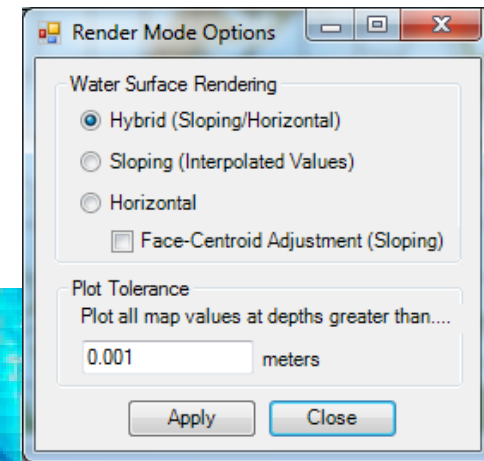
- Edit Map Parameters
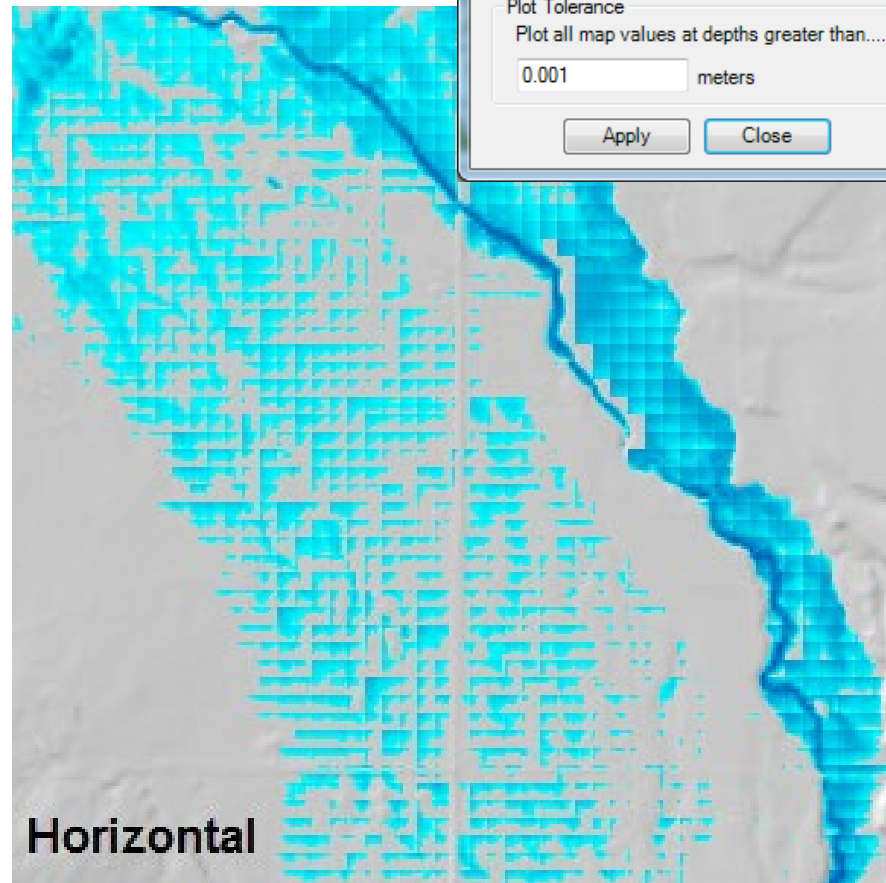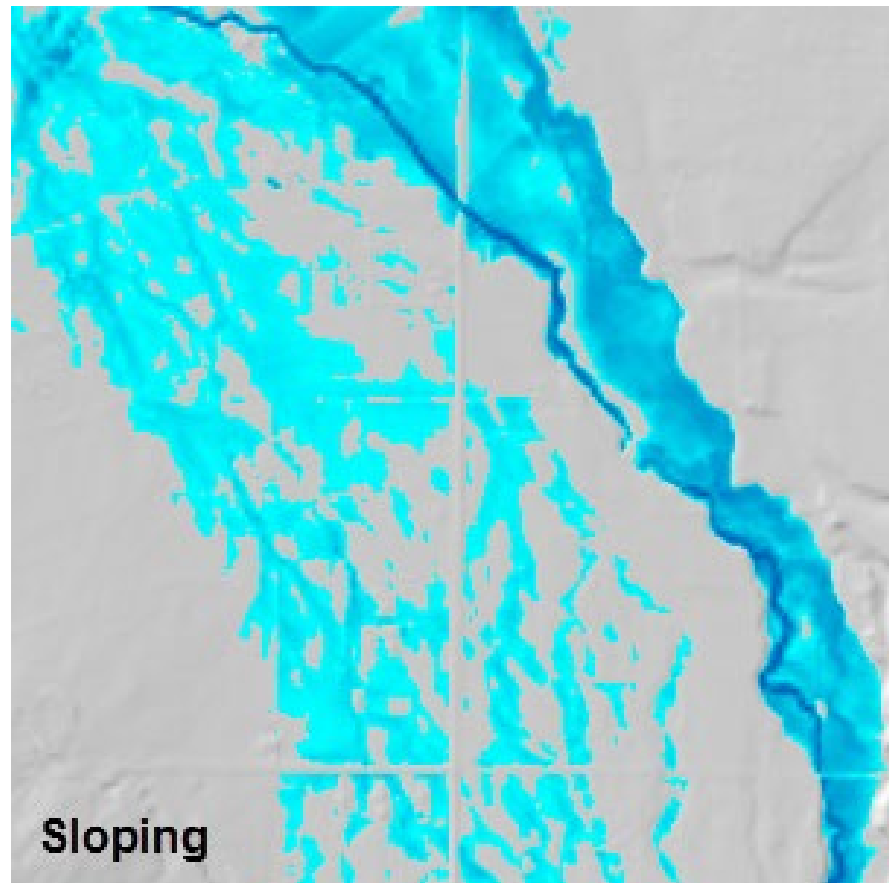
- Compute Map

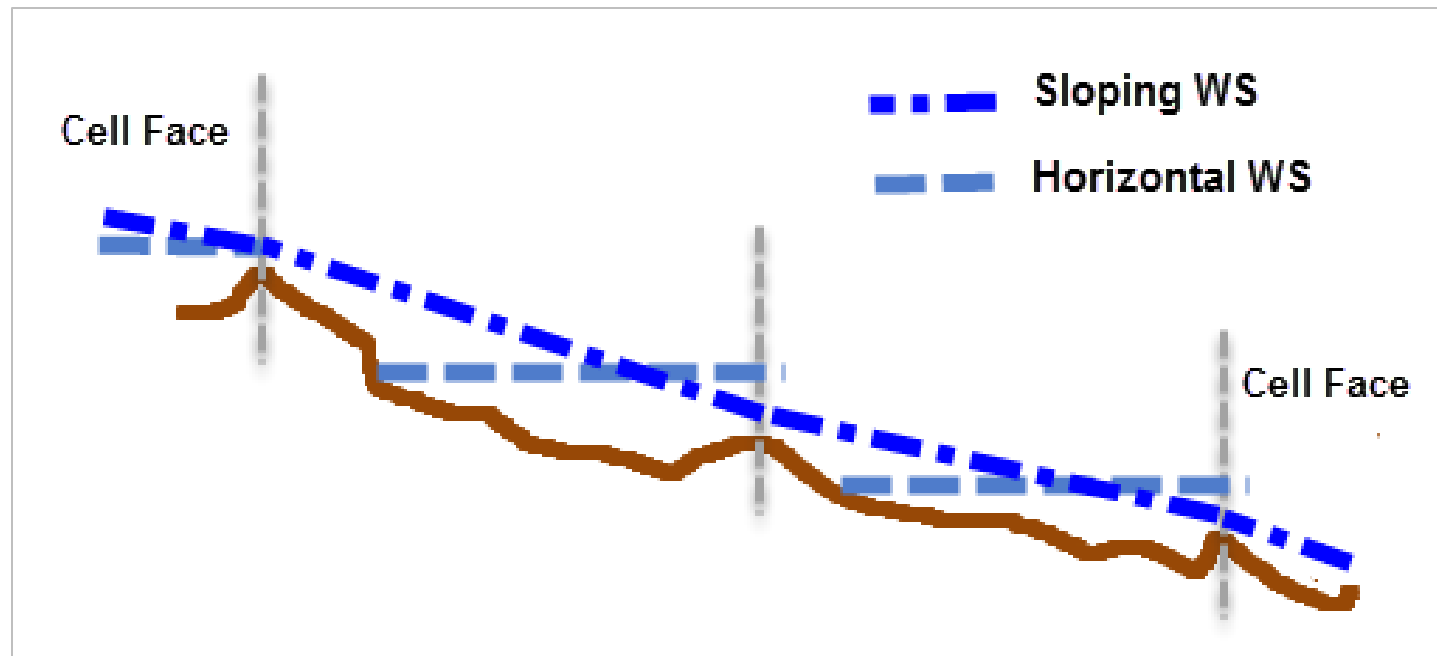# Results Layer Properties

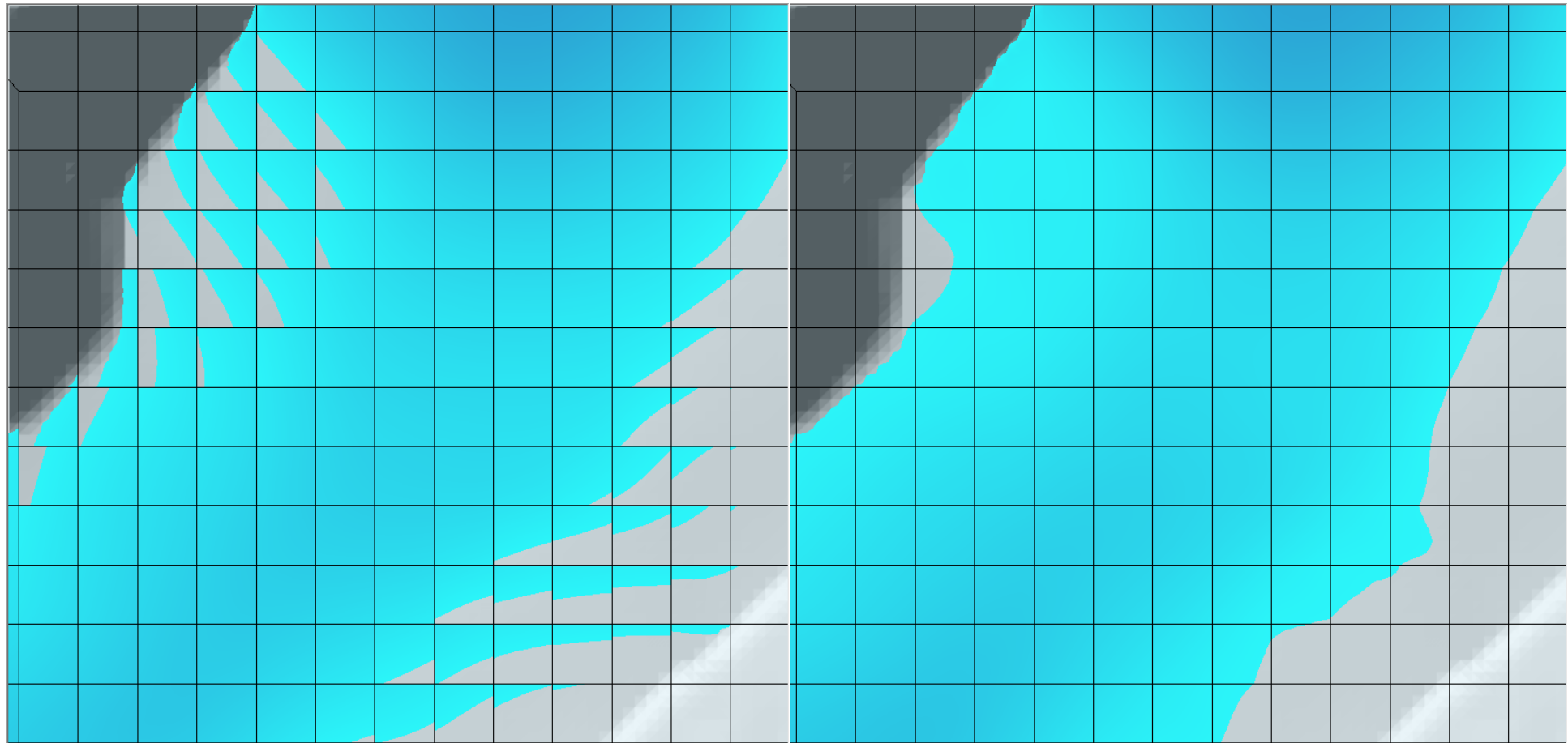# Results Visualization

Render Mode Options

Results Interpolation

- Render mode options allow for interpolation of water surface elevation values or plotting values at the cell centers.
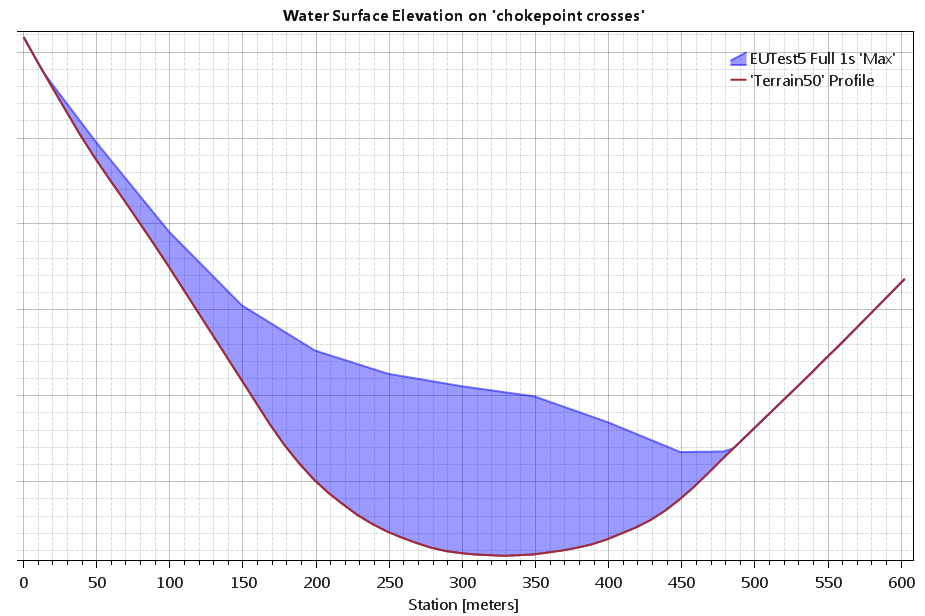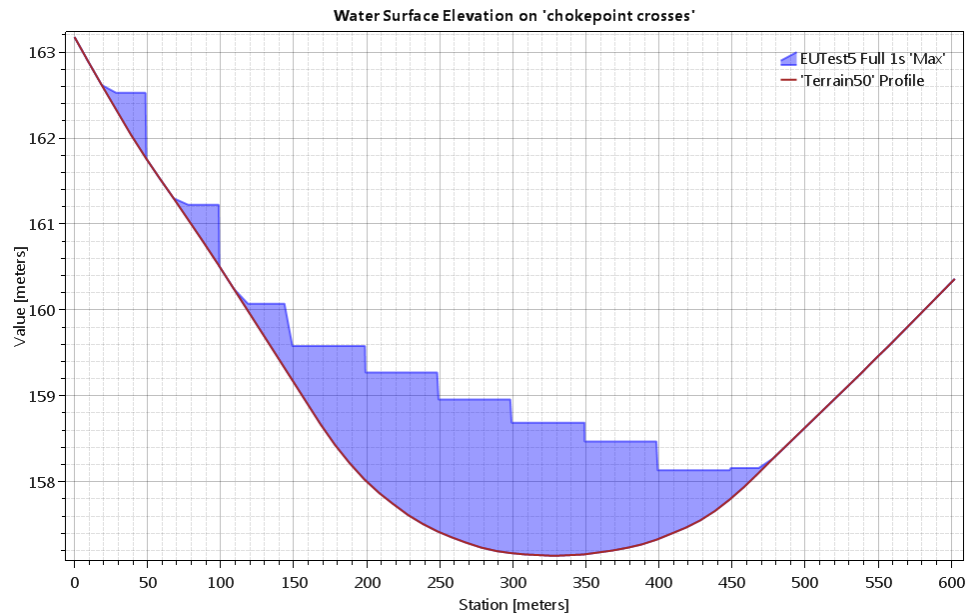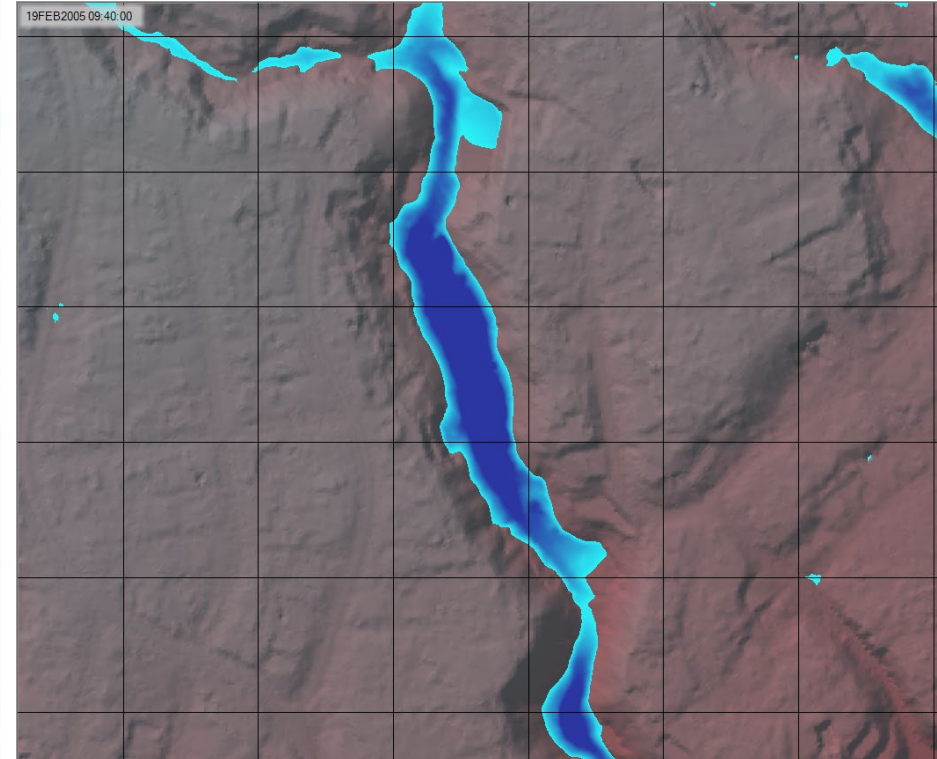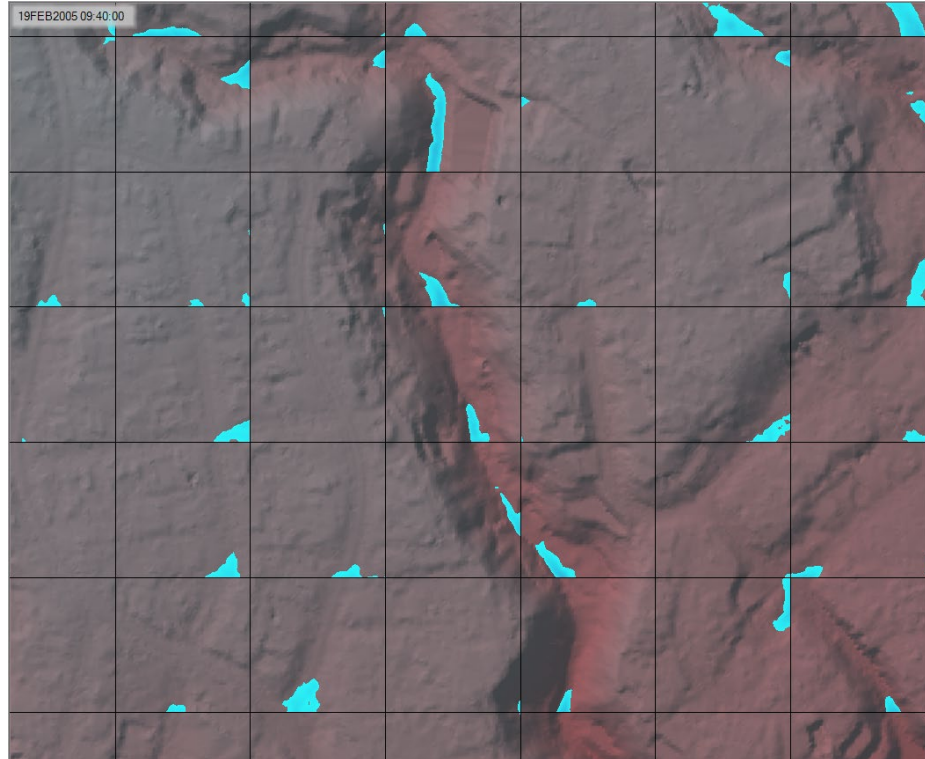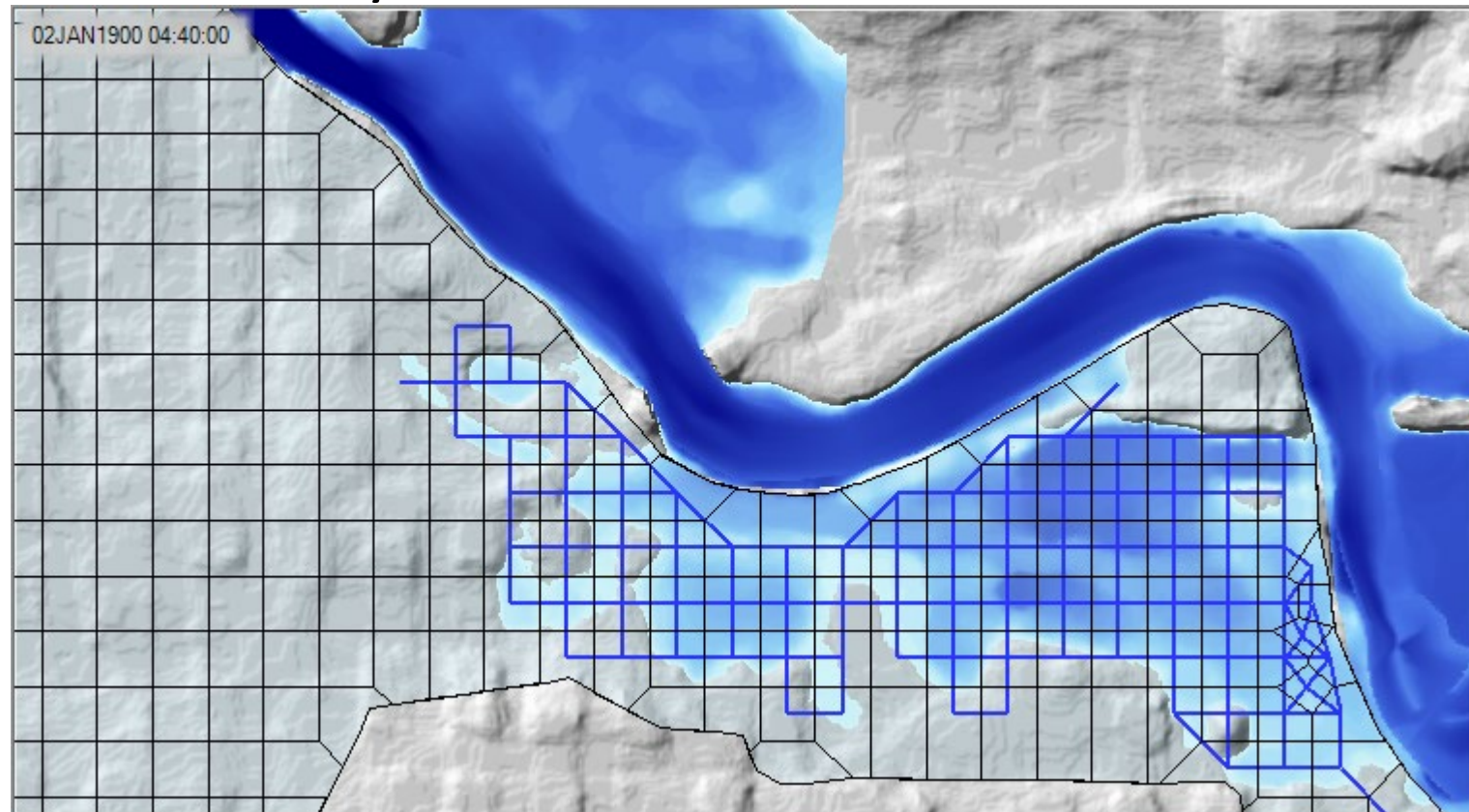
Horizontal vs Sloping Surface

Horizontal vs Sloping Surface

Sloping Surface Errors

Depth Results

- Hydraulic connectivity from mesh

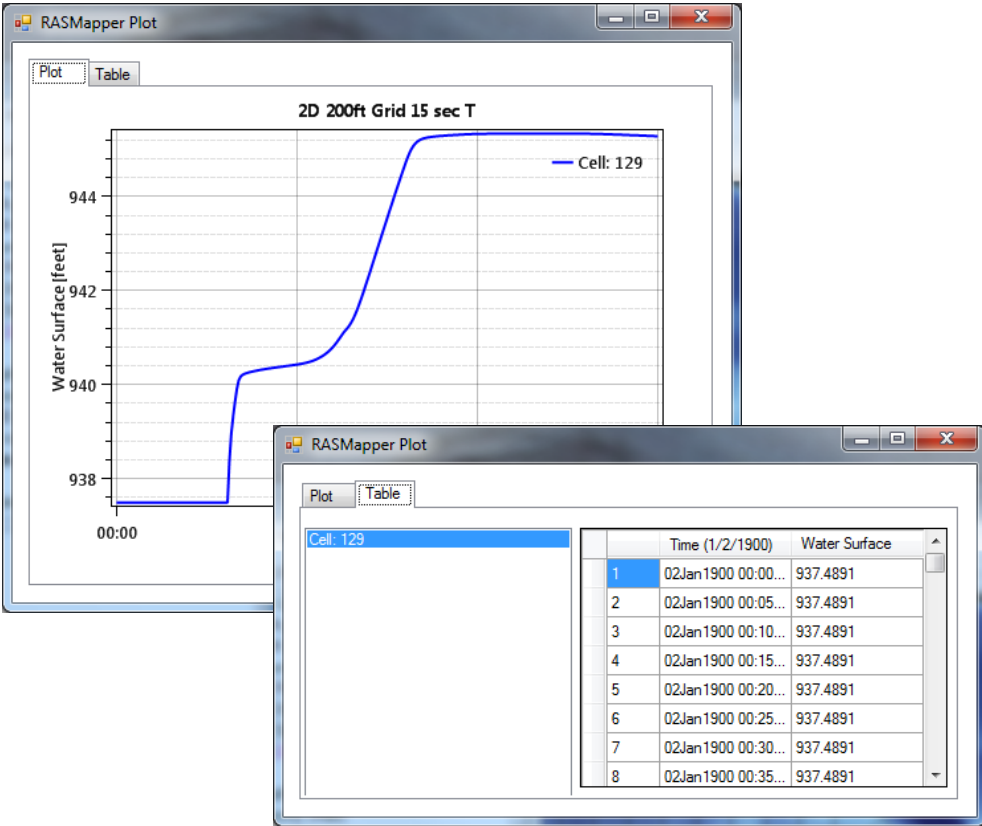02JAN1900 04:40:00

Results Query

- 2D Flow Area query

2D Flow Area Queries

- Hydraulic Properties

  Cell: Volume - Elevation

  Face: Area - Elevation

  Face: Wetted Perimeter - Elevation

  Face: Manning's n - Elevation

  Face: Profile

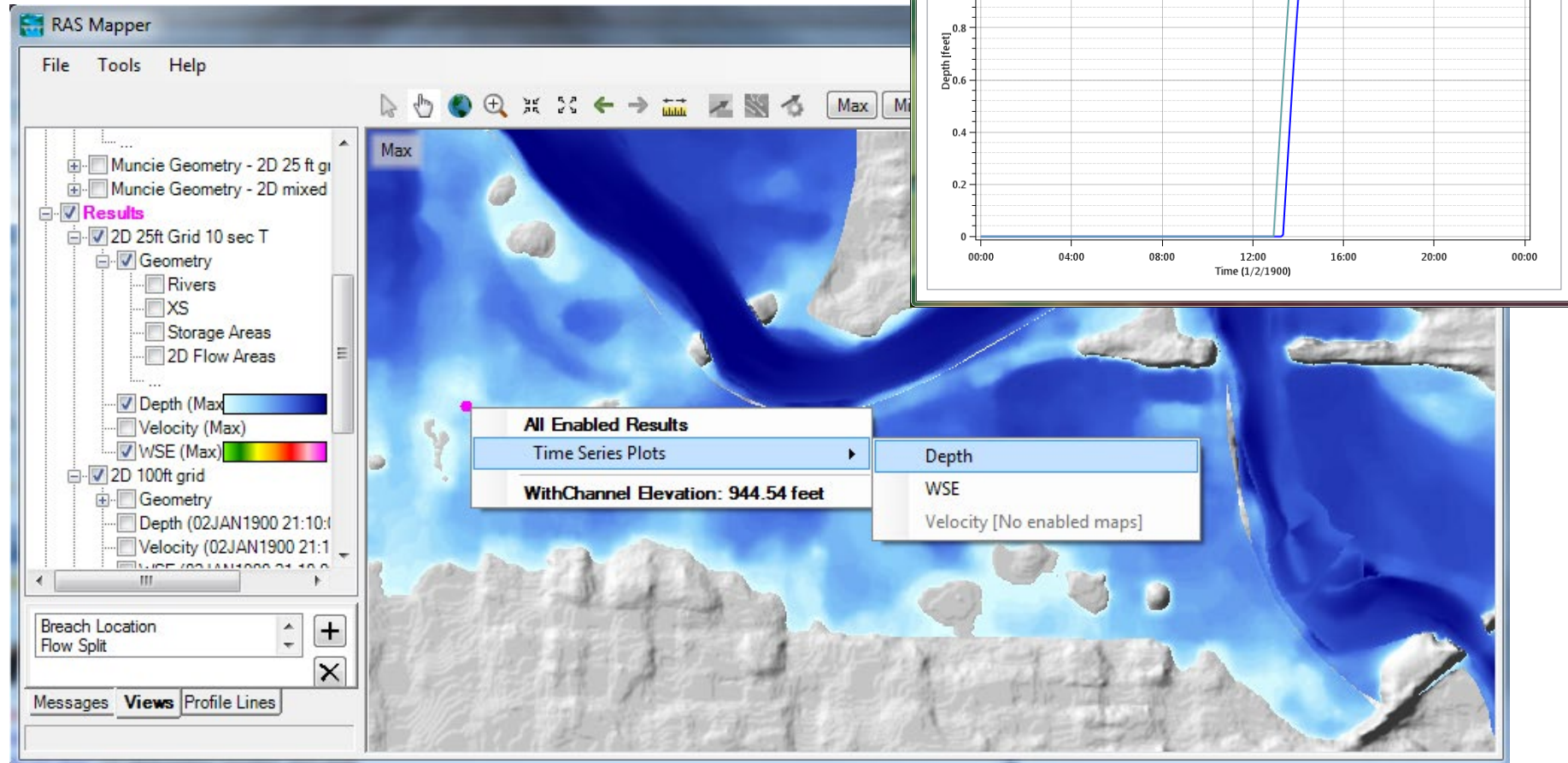- Time Series

  Cell: Water Surface

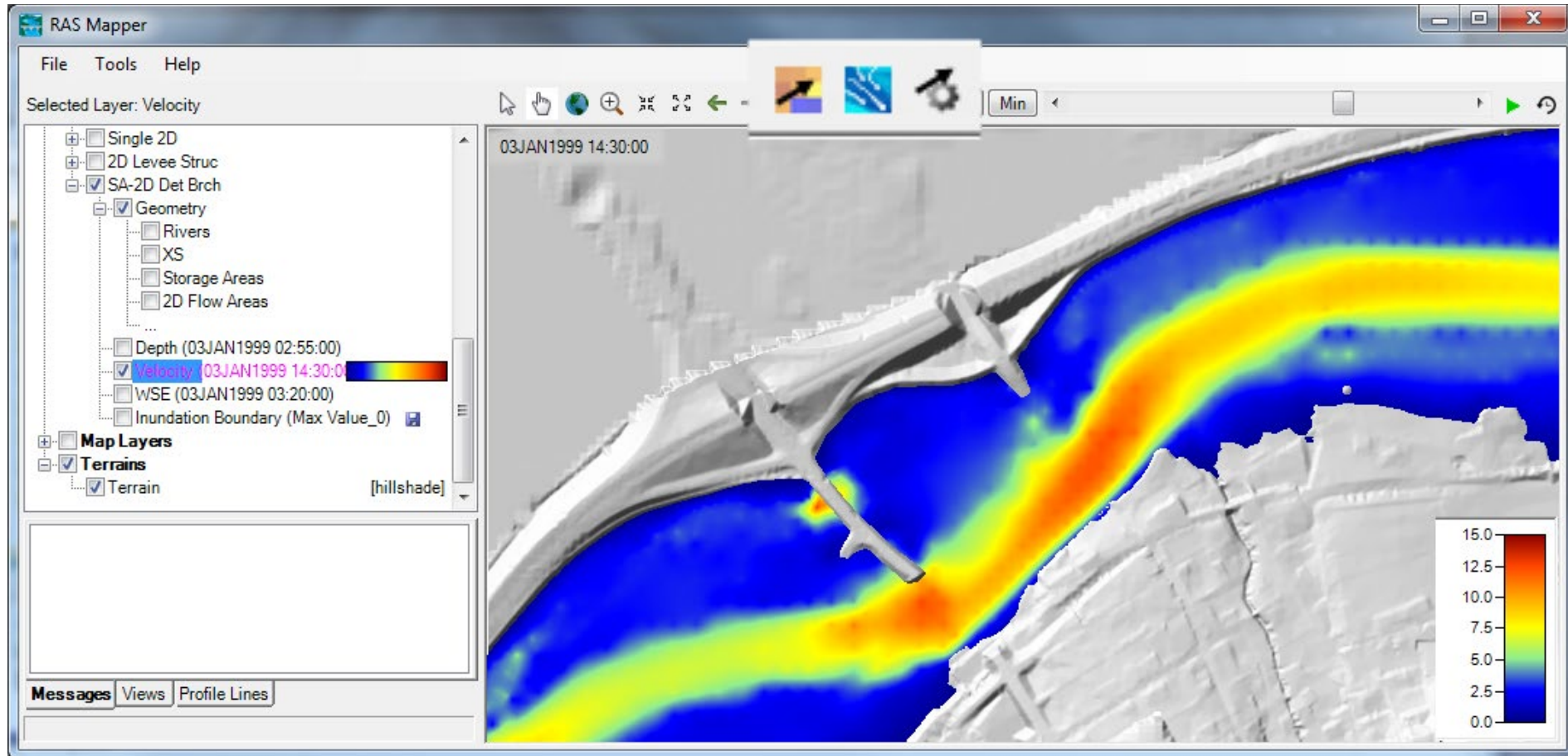 Cell: Depth

  Cell: Shear Stress

  Face Point: Velocity

Results Query

- Time Series

Velocity Results

Velocity Arrows
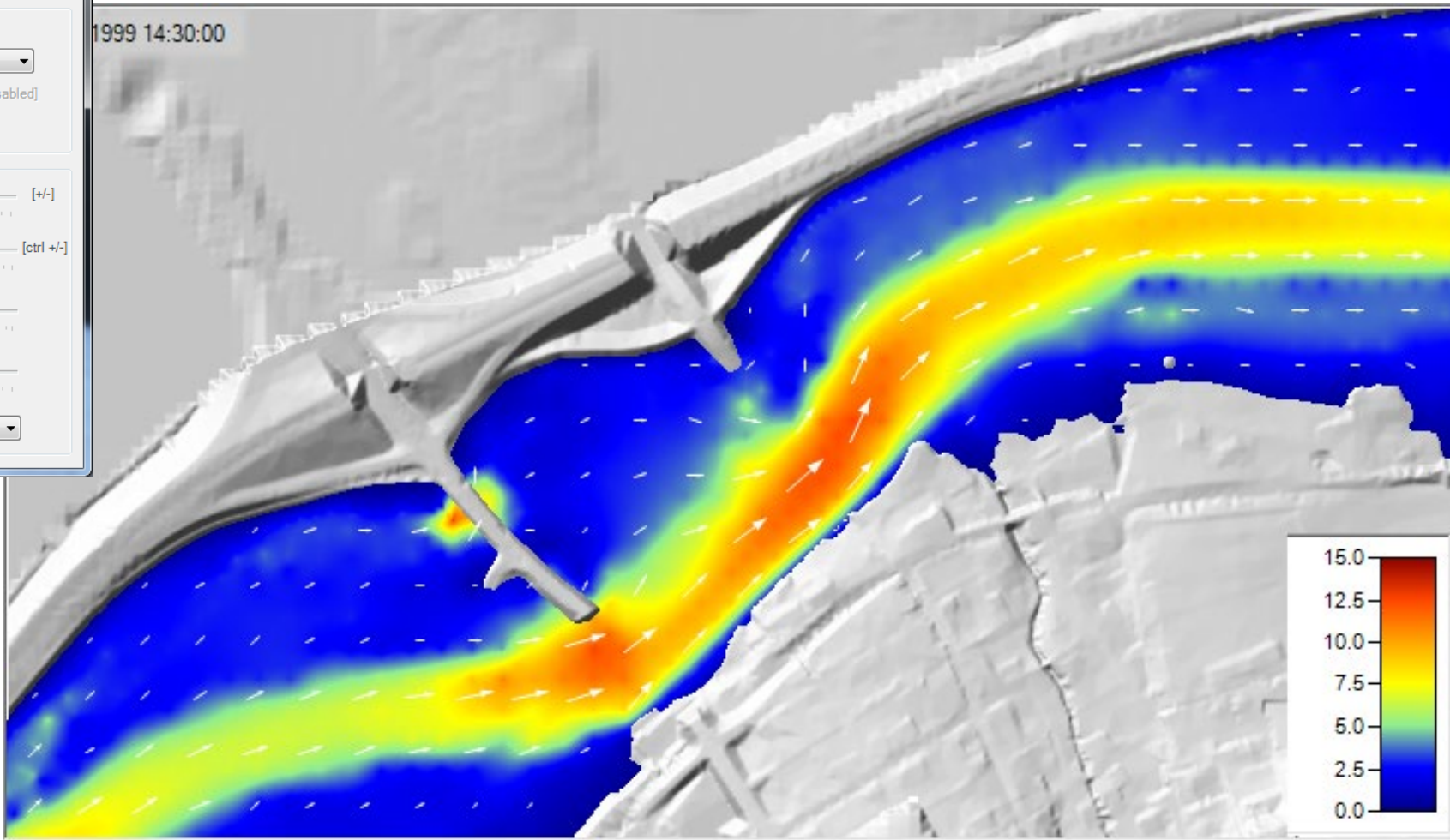
Velocity Tracing
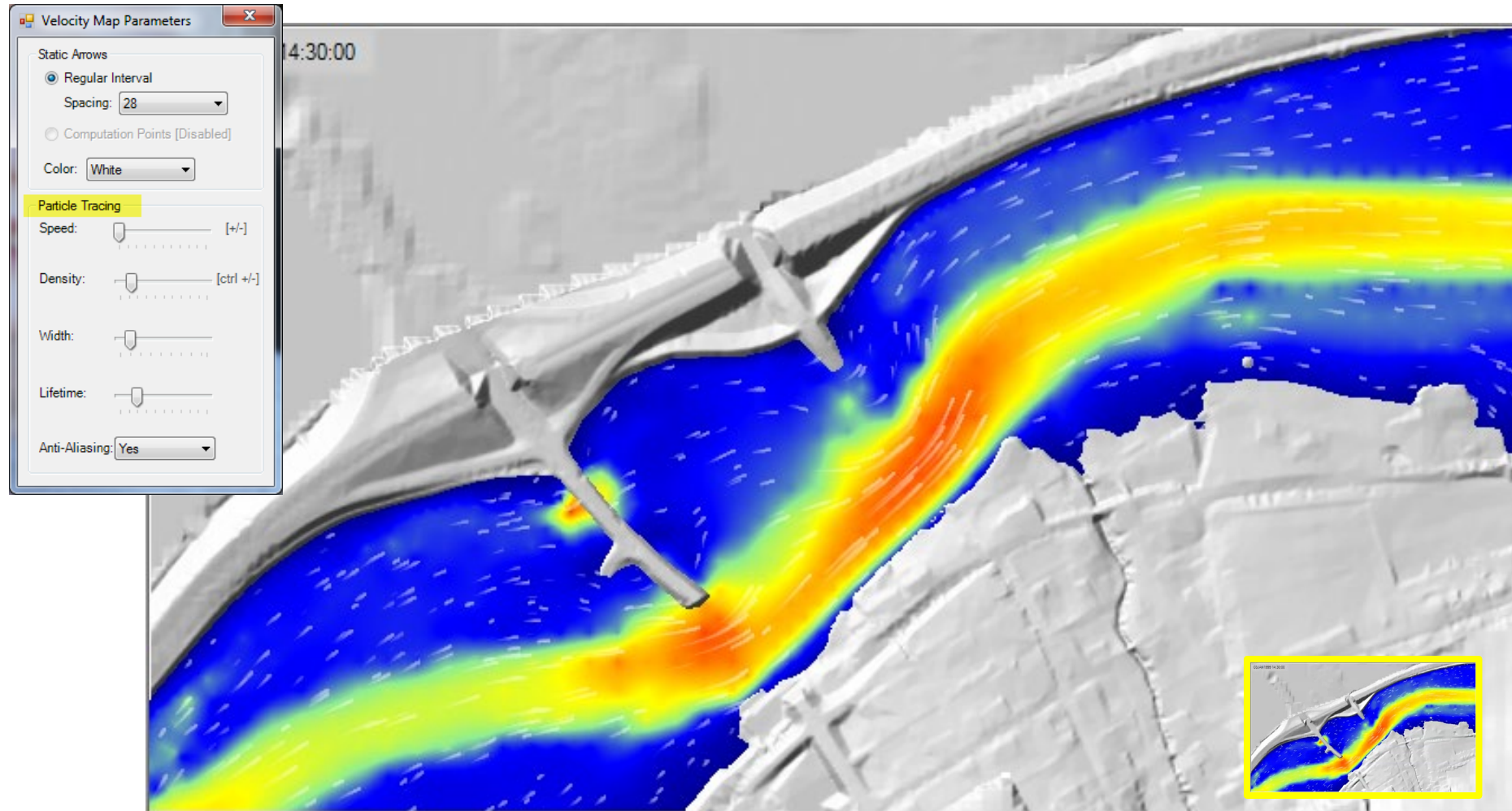
Profile Lines
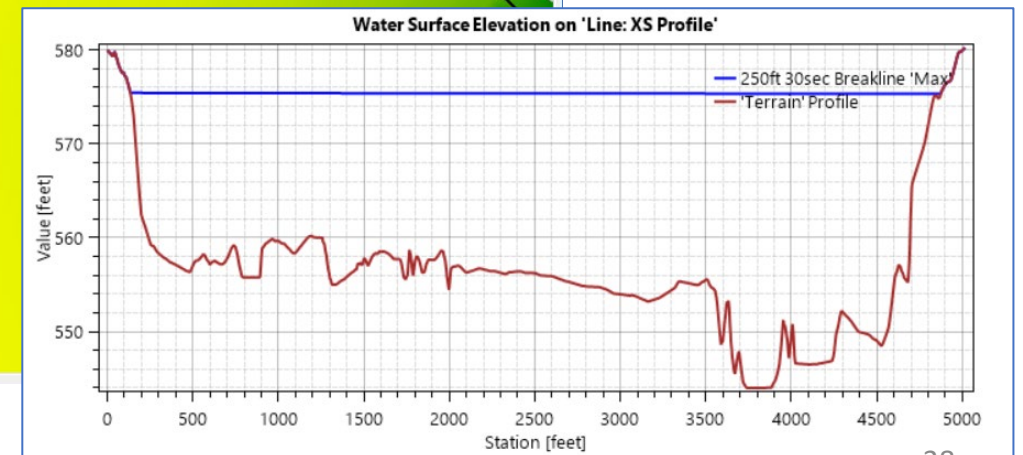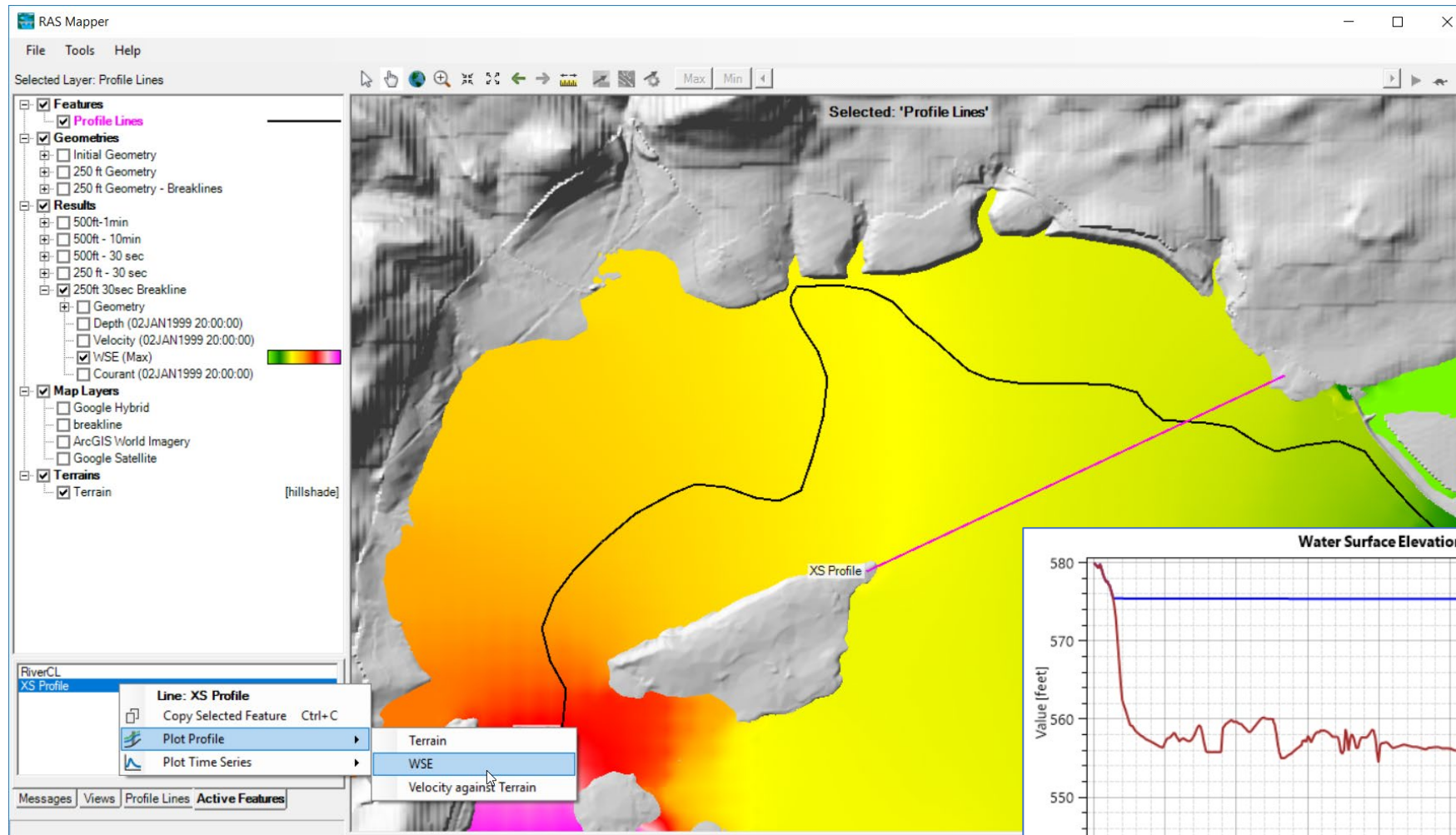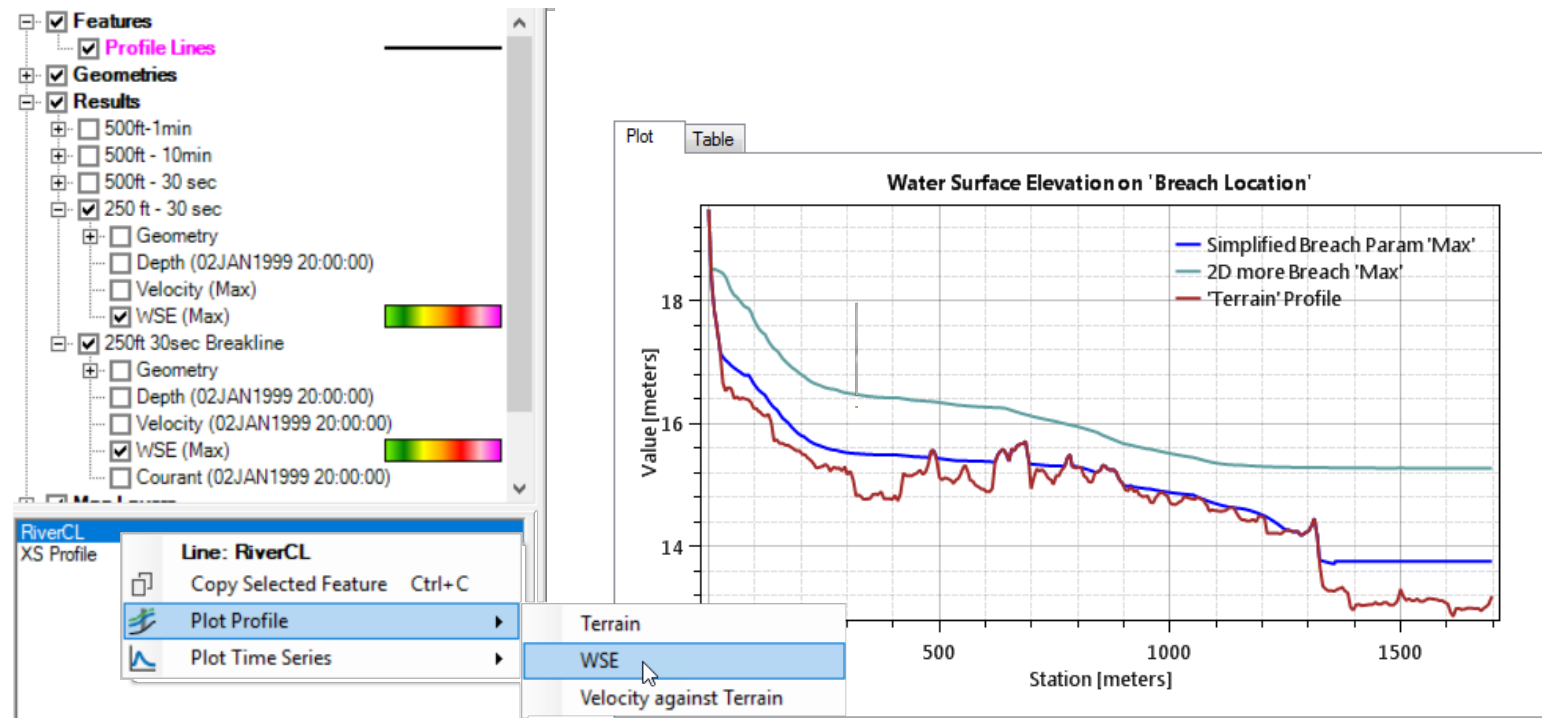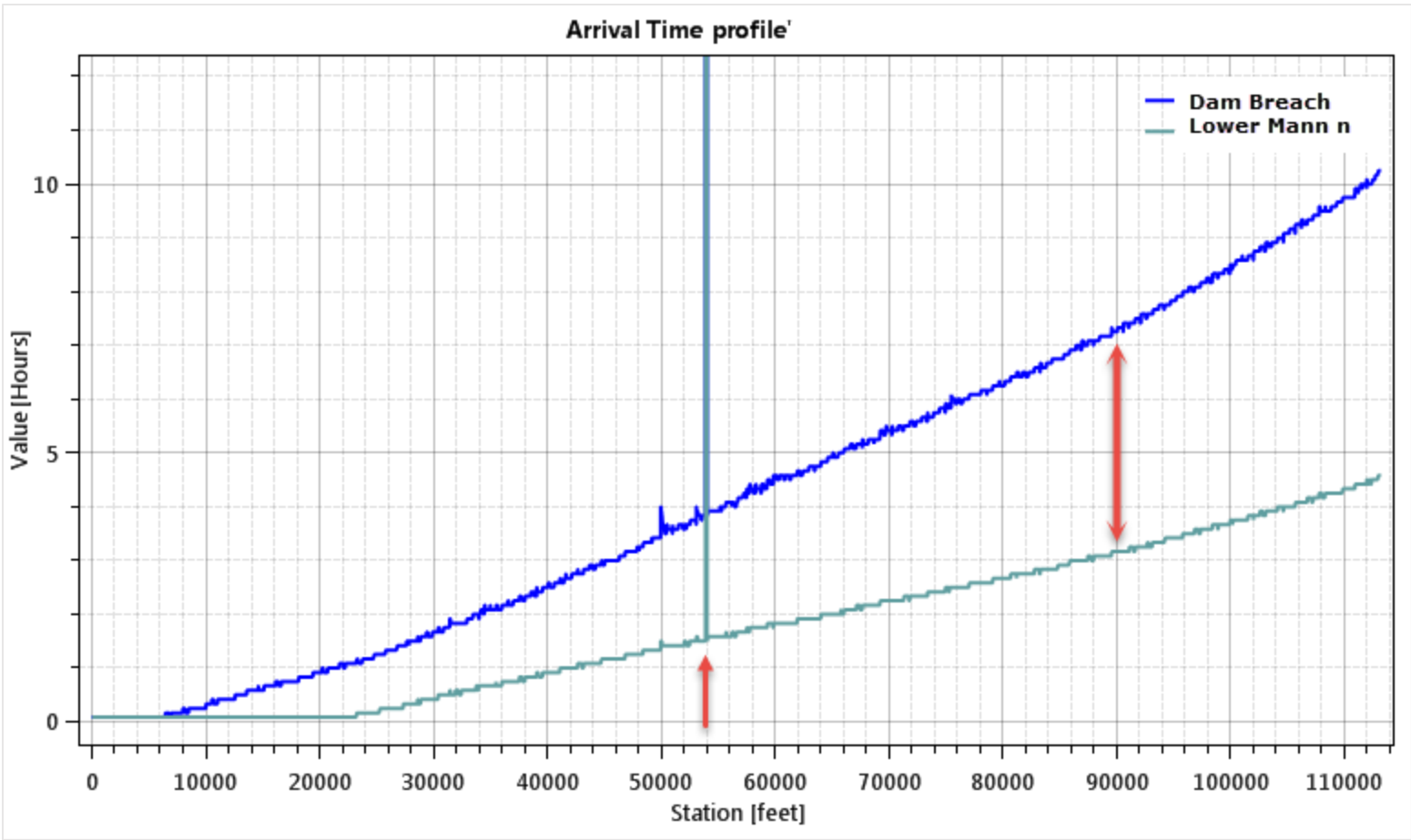
Profile Line - Comparison

- Turn on multiple result maps

- Choose a Profile (i.e. 'Max')

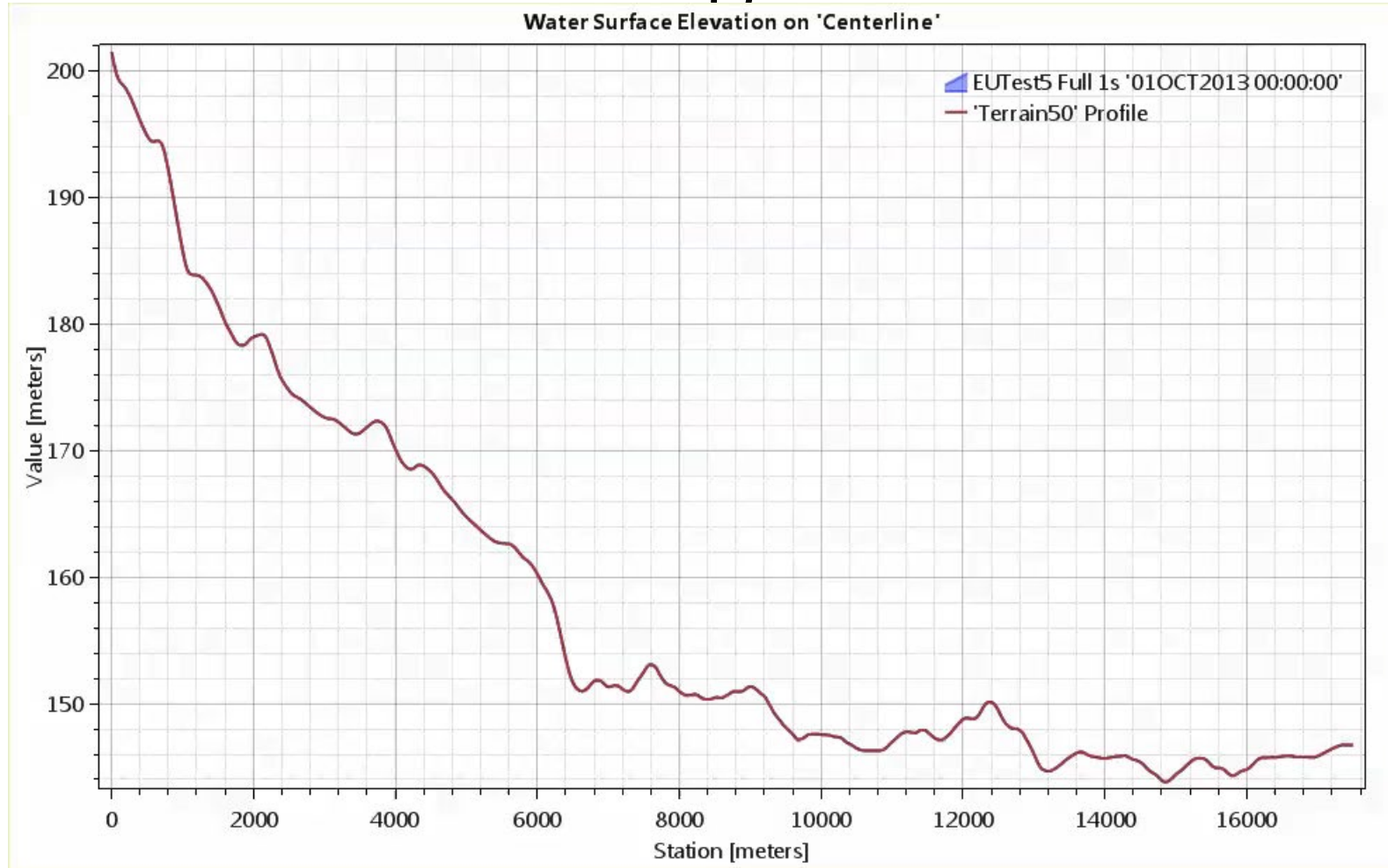- Choose **Plot Time Series** or **Plot Profile**
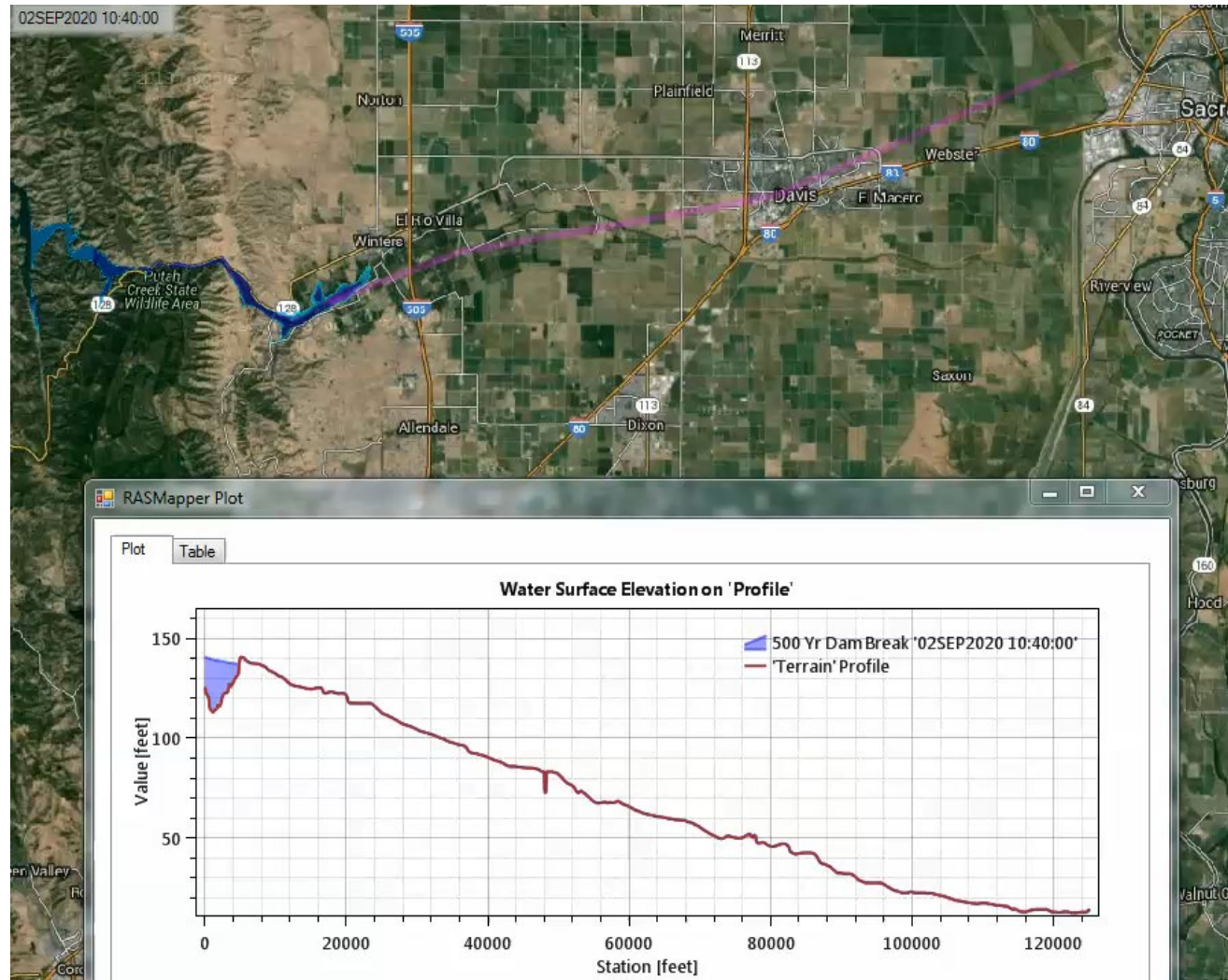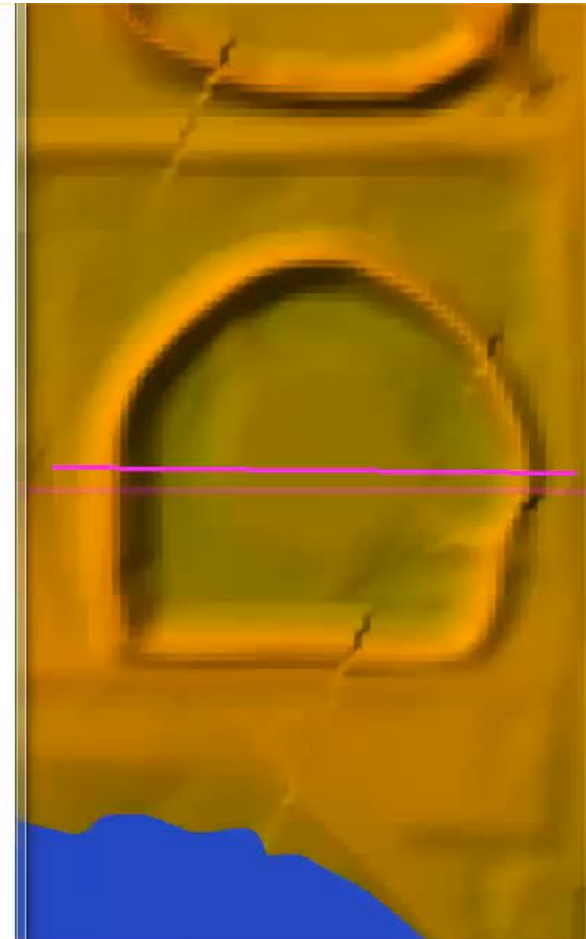
Profile Lines - Comparison

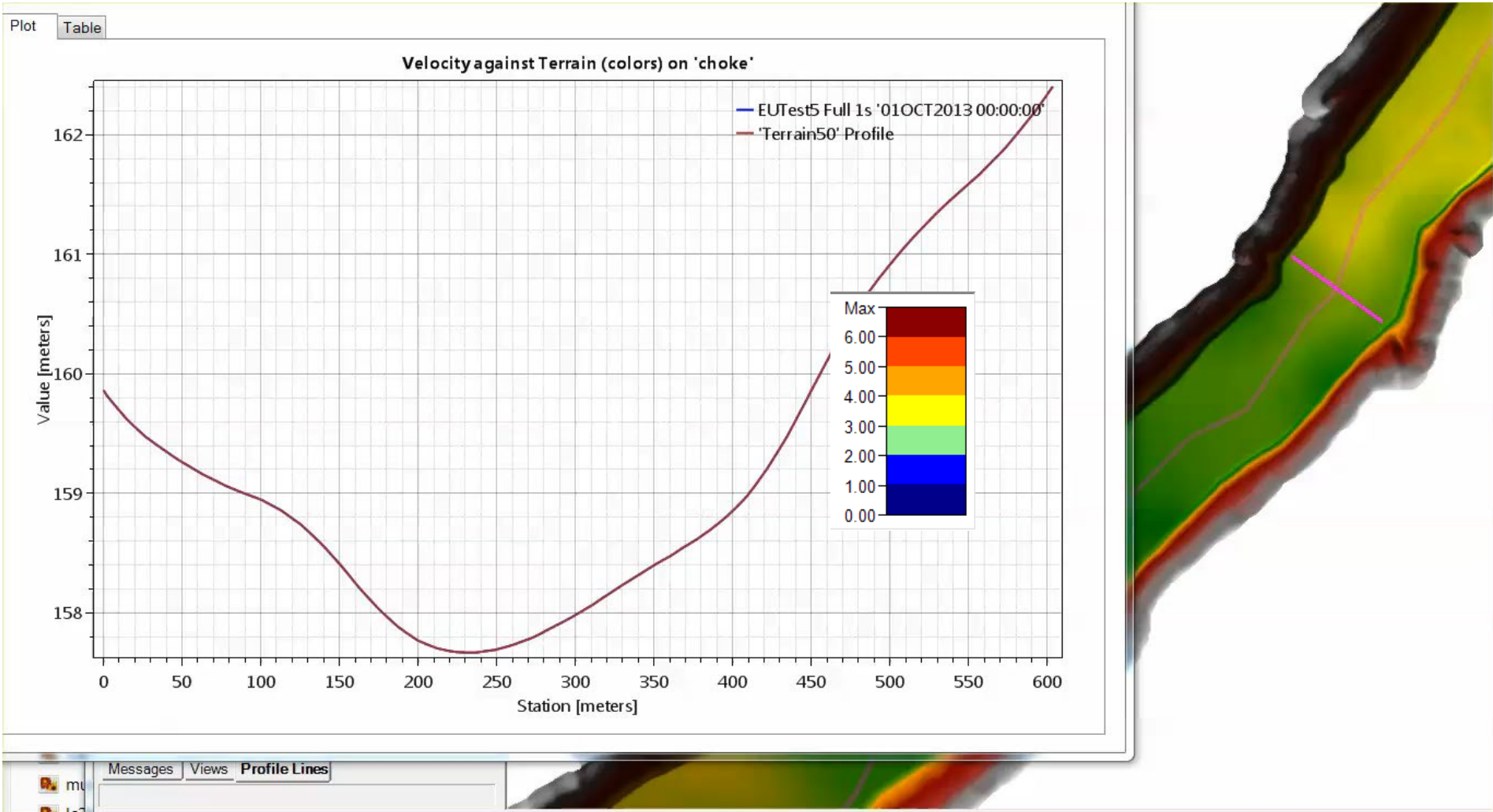# Profile Lines - Animating

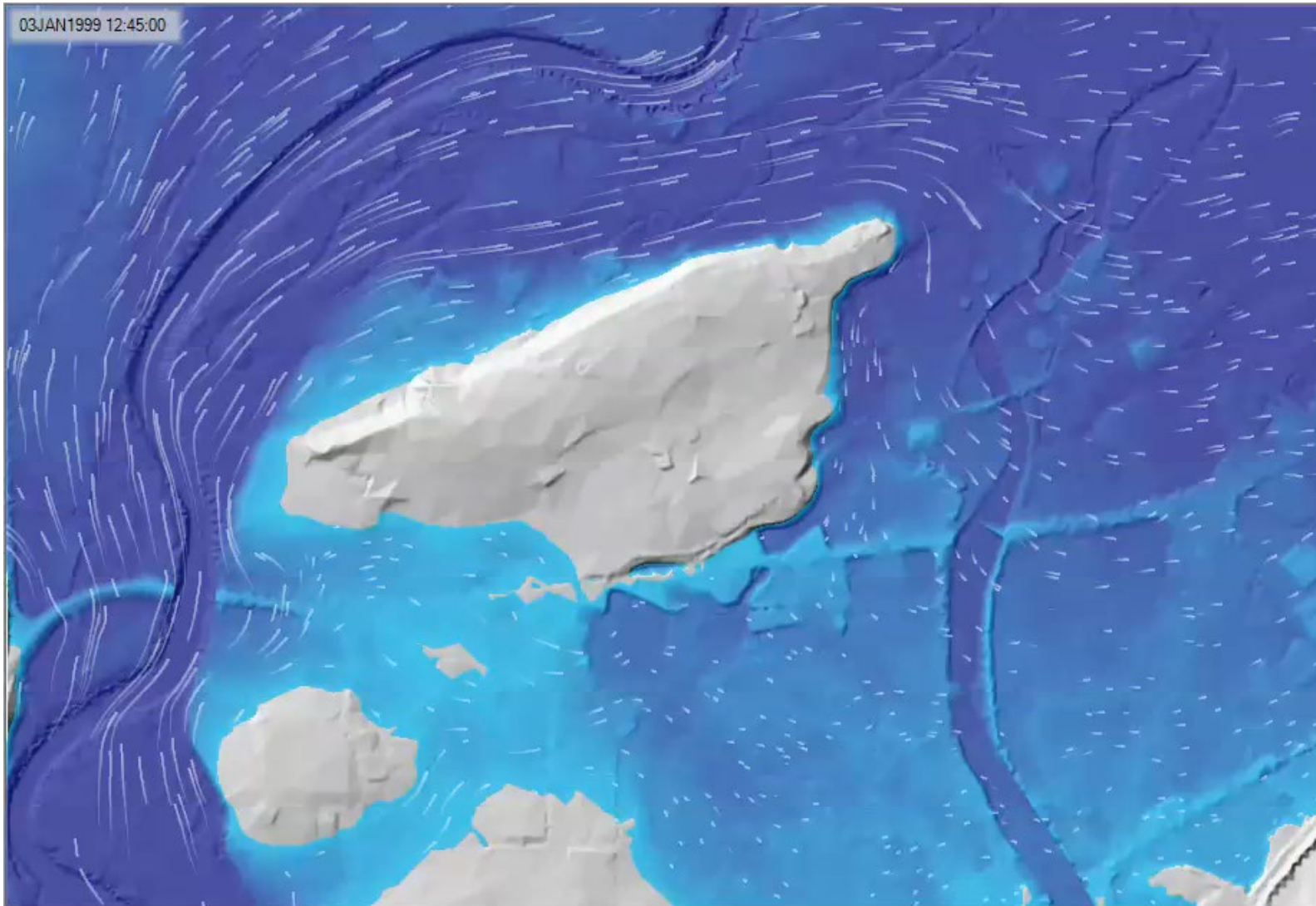# Profile Lines + Spatial Results

Profile Lines - Animating

Profile Lines – Velocity

Velocity Trace Animation

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Questions?