

A scenic view of the McCloud Reservoir, featuring a large concrete dam with a spillway in the background. The water is a vibrant turquoise color. In the foreground, there's a concrete structure with a metal gate. The surrounding landscape is a mix of rocky terrain and dense evergreen forests under a clear blue sky.

# *McCloud Reservoir Modeling*

Prepared for The Nature Conservancy

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# Objective and Setting

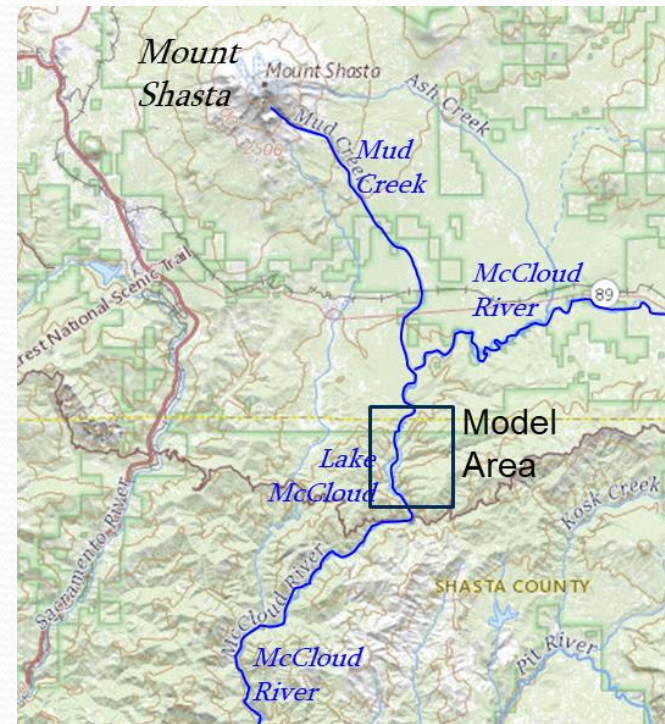
## Objective

Characterize fate and transport of suspended sediment within McCloud Reservoir

## Setting

- Mud Creek is a natural source of turbidity events (snow melt, thunderstorms)
- Reservoir impacts magnitude and duration of turbidity events
- Environmental impact of extended turbidity events

## Preliminary Results



# Approach

Model: CE-QUAL-W2

- Two-Dimensional (x-z)

Constituents

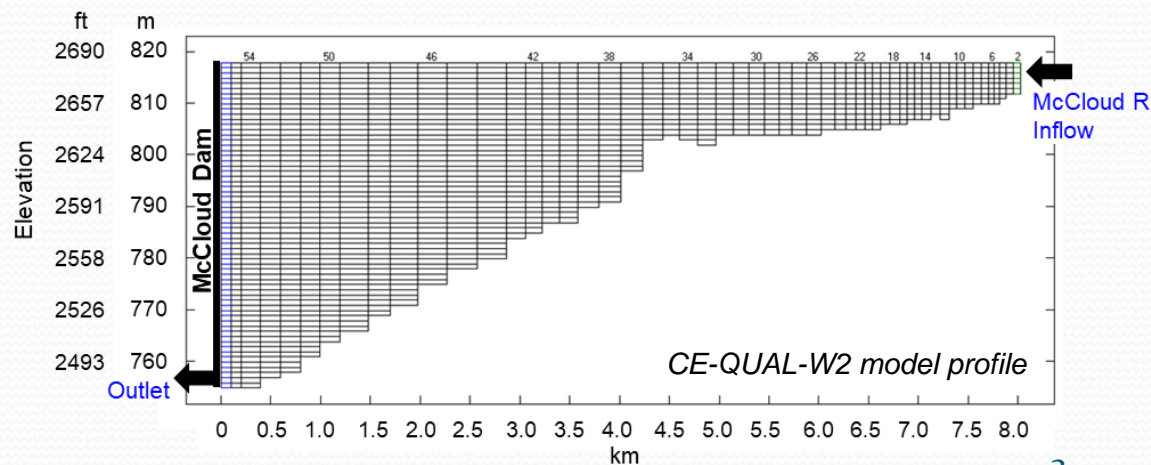
- Flow
- Temperature
- Turbidity (ISS)

Simulation Period

- Summer 2023

Scenarios

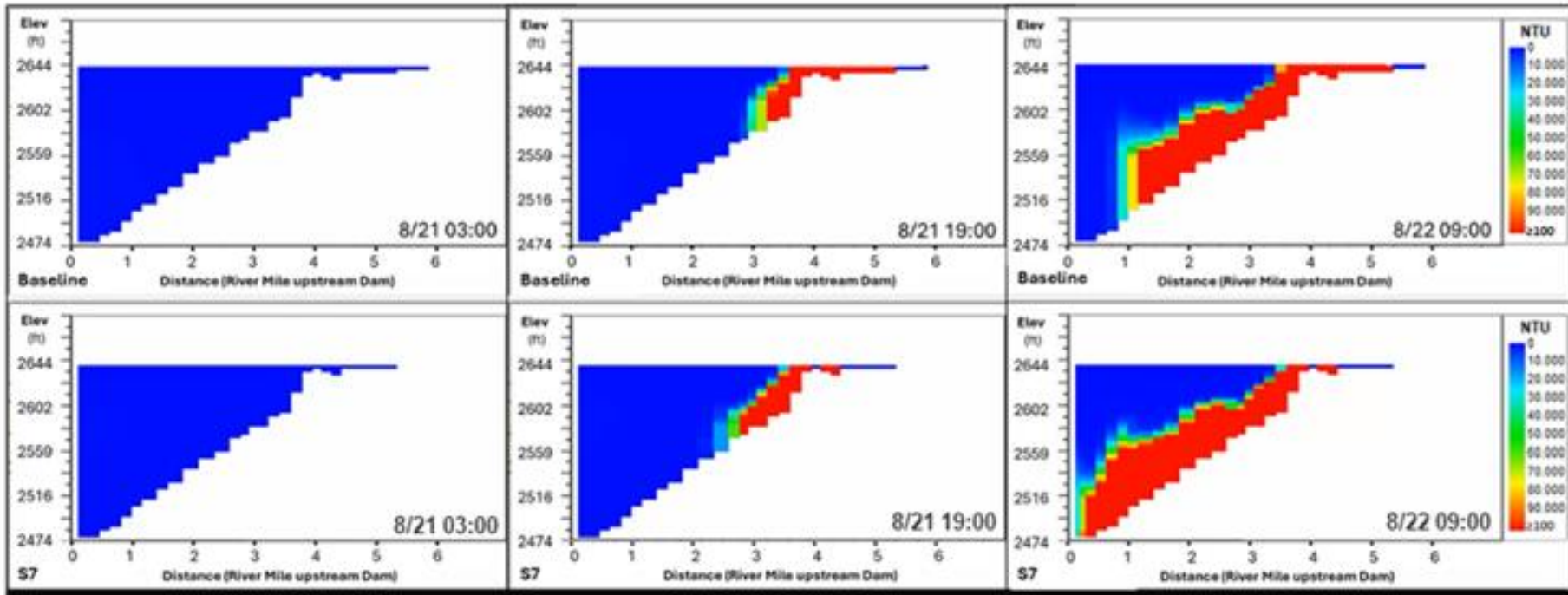
- Baseline: 200 cfs outlet
- Scenario: 800 cfs outlet





# 8/21 to 8/22

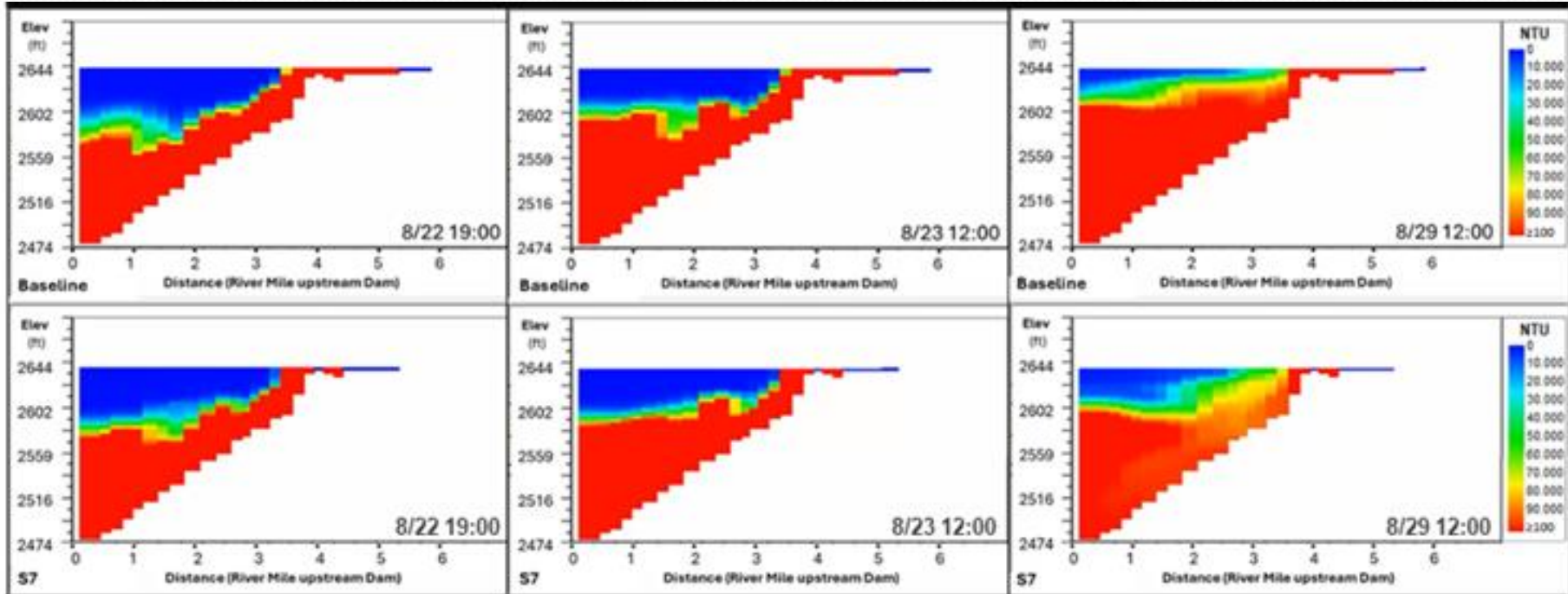
BASELINE CASE



- 8/22 (day 1): Scenario 7 higher outflow rate results in turbidity plume reaching dam quicker
- Vertical extent of plume at dam  $\approx 40$  ft

# 8/22 to 8/29

BASELINE CASE

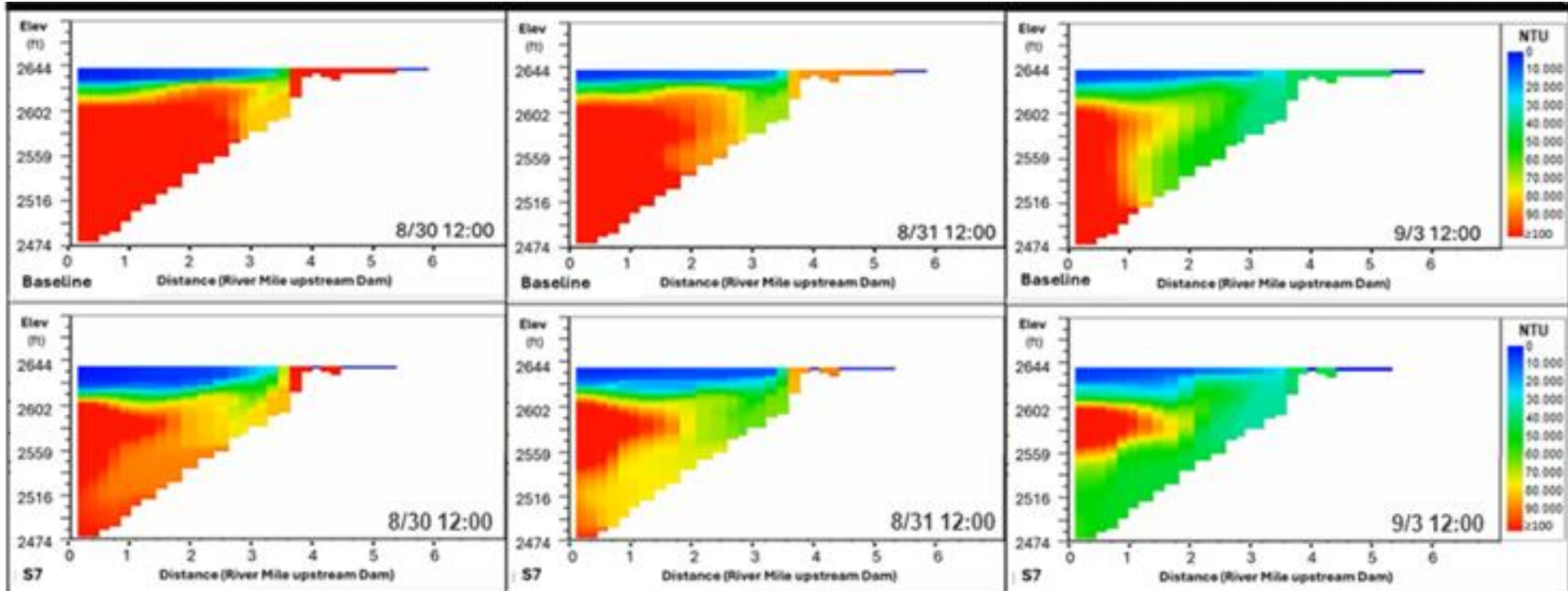


- Similar volume where turbidity exceeds 100 NTU due to vertical extent of sediment plume at dam



# 8/30 to 9/3

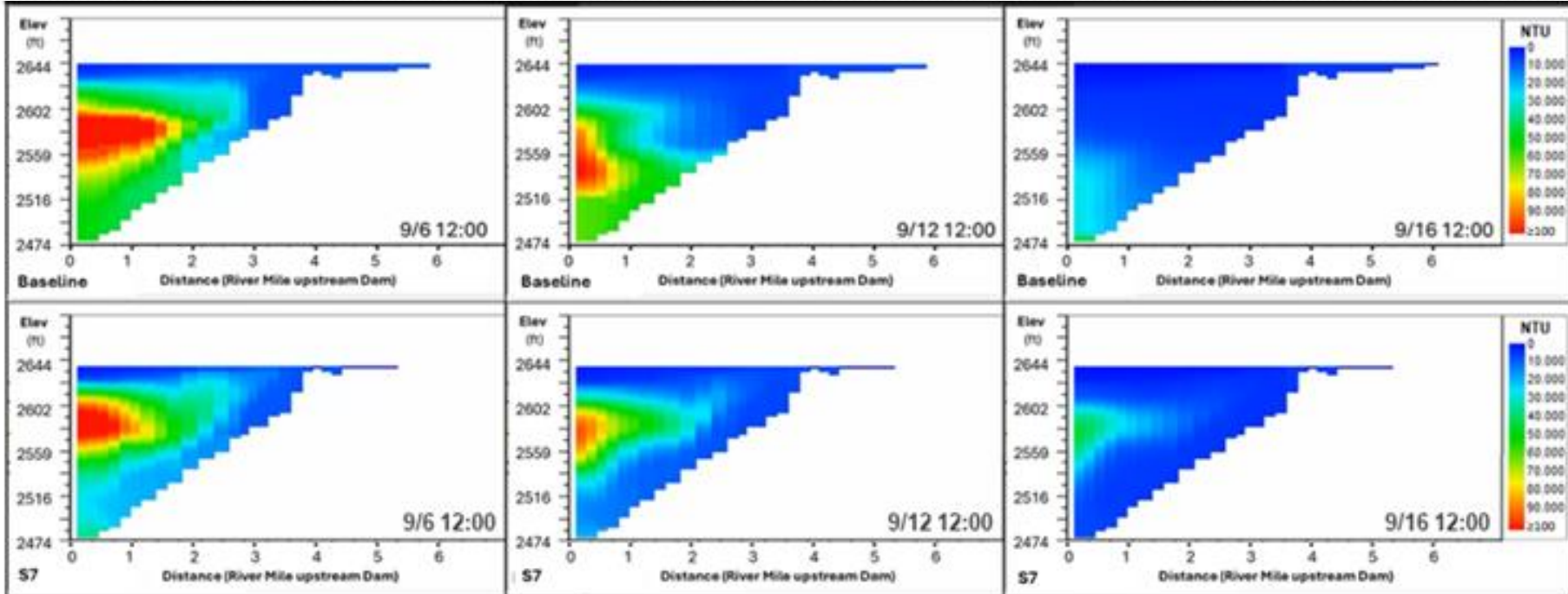
BASELINE CASE



- 8/30 (day 8): deeper waters indicate reduced turbidity, and by 9/3 (day 12) notable differences
- 8/31 (day 9): turbidity event abates

# 9/6 to 9/16

BASELINE CASE



- 9/6 (day 15): deeper waters indicate reduced turbidity and by 9/3 notable differences at
- Reservoir outflow “clears”  $\approx$ 10 days earlier for scenario



Thank you

