End of Season Water Quality Update

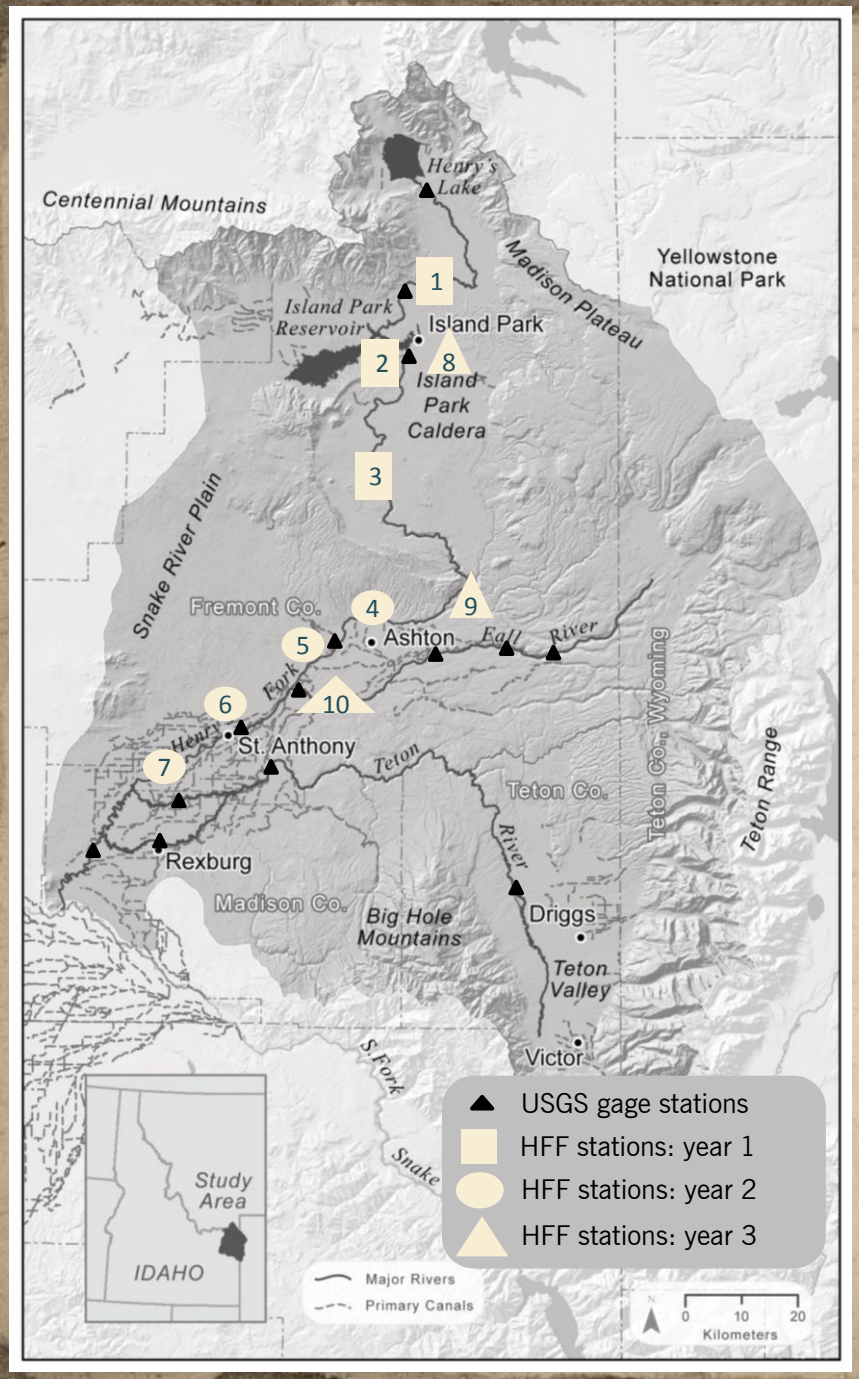
Henry's Fork Watershed Council
October 13th, 2015

Melissa Muradian
Henry's Fork Foundation

THE VOICE OF THE RIVER
SINCE 1984
HENRY'S FORK
FOUNDATION

HFF Water-quality Monitoring

1. Monitor long-term changes to key water-quality attributes in major river reaches and tributaries.
2. Understand chemical, physical, and biological context for interpreting research and monitoring results (fish, waterfowl, invertebrates, etc.).
3. Establish the capability to rapidly collect pre- and post-project data to evaluate effects of new facilities and management actions (e.g., increasing storage in IP or Ashton reservoirs).



Fixed Locations

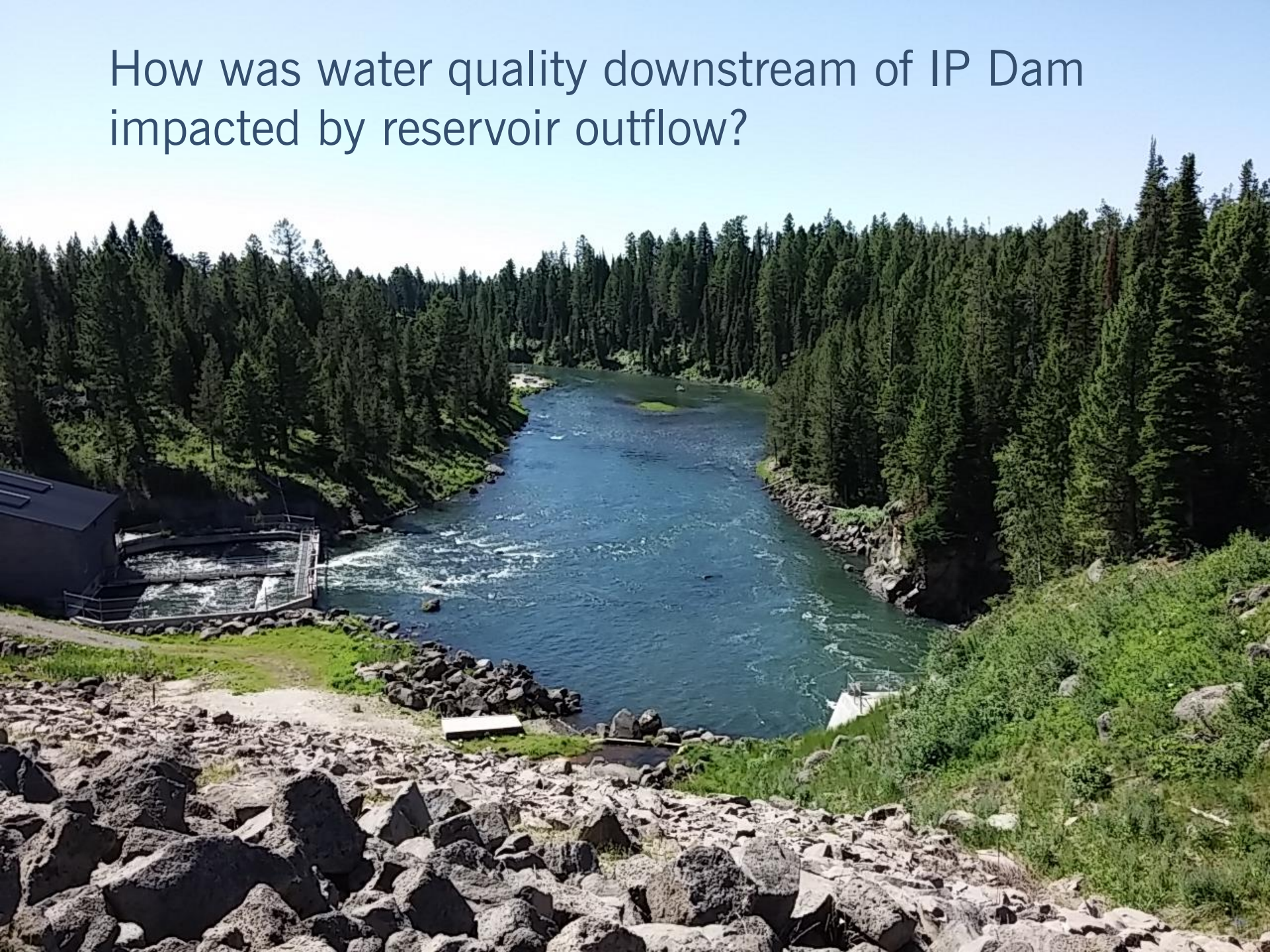
1. Above IP Reservoir
2. Below IP Dam
3. Pinehaven/Riverside area
4. Above Ashton Reservoir
5. Below Ashton Reservoir
6. St. Anthony
7. Above NF Teton River
8. Buffalo River
9. Warm River
10. Fall River

Sondes installed at sites 1-4 in 2014 and sites 5-7 in 2015!

Plans for 2015

- Continue field samples/lab analysis of suspended sediment and phosphorus to accompany sonde data
- Install new sondes:
  - Below Ashton Reservoir
  - St. Anthony
  - Parker-Salem Road
- Investigate seasonal high-turbidity events below IP Dam
  - High-turbidity discharge from dam gates in late July when total discharge exceeds power plant capacity
  - High-turbidity discharge through power plant at low flows during late September (reservoir turnover?)
  - Depth profiles in reservoir, continuous sondes on both sides of river, underwater photography (IDEQ, USGS, IDFG, HFF)

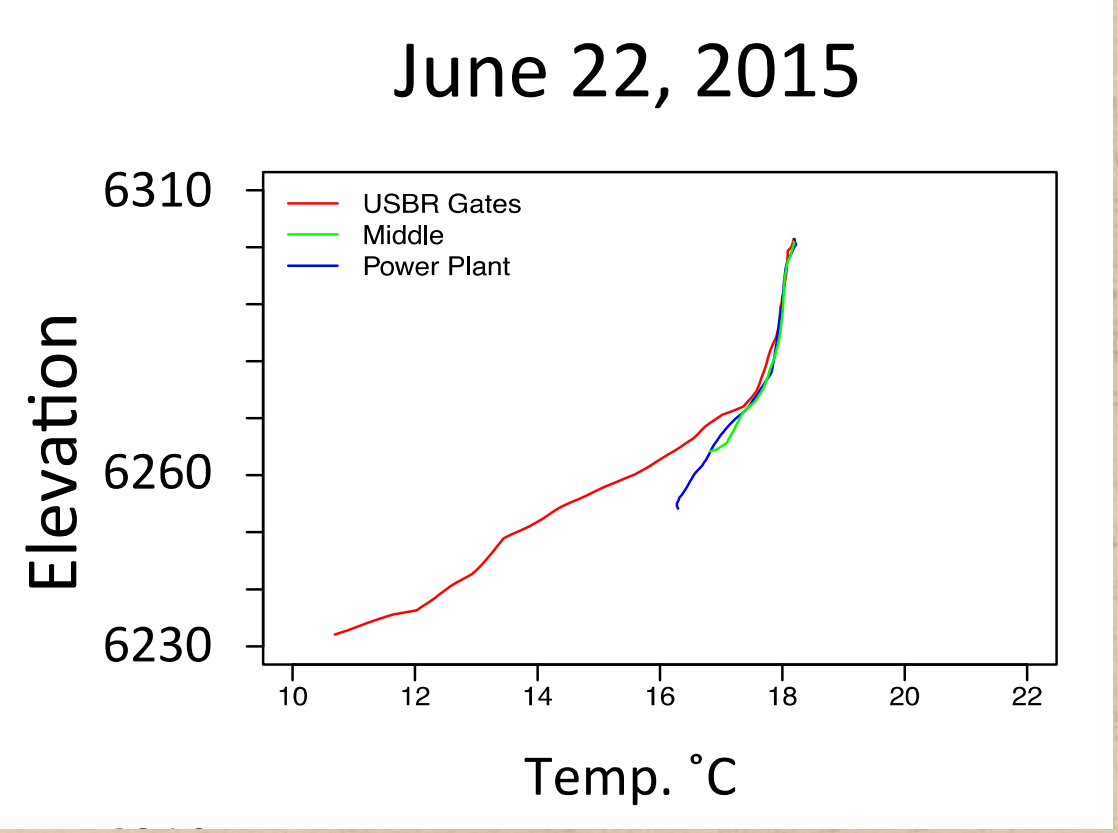
How was water quality downstream of IP Dam impacted by reservoir outflow?



Sites 1-3: Depth profiles: turbidity, temperature, and dissolved oxygen (DO)
Sites 4-5: Continuously-recording sondes: turbidity, temperature, dissolved oxygen (DO), conductivity…
Site 6: Water sample location (outflow sources are well mixed)

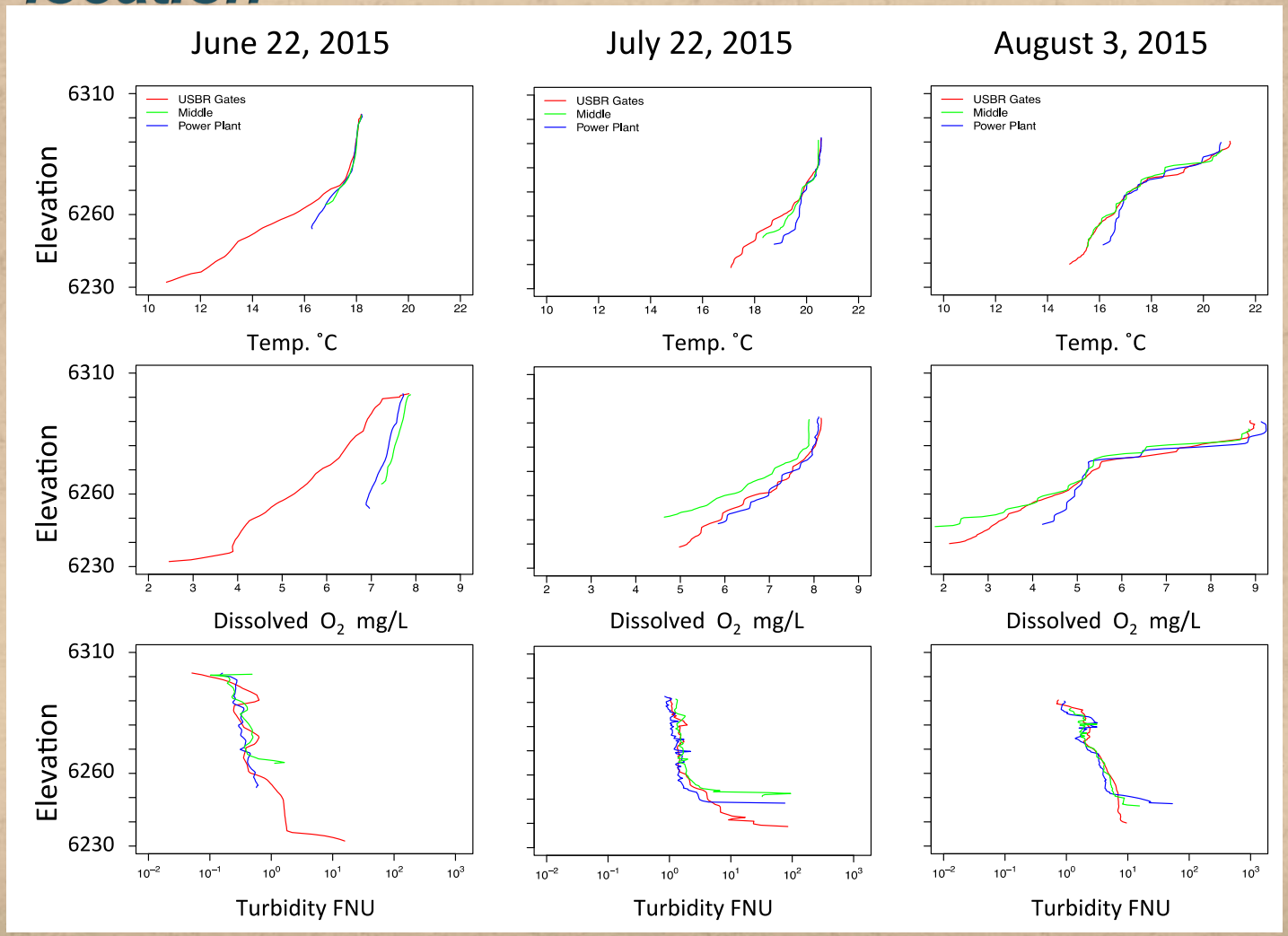
2 sondes downstream of IP Reservoir: IP West (gates outflow), IP East (power plant)

Depth profiles: temperatures at depth across locations

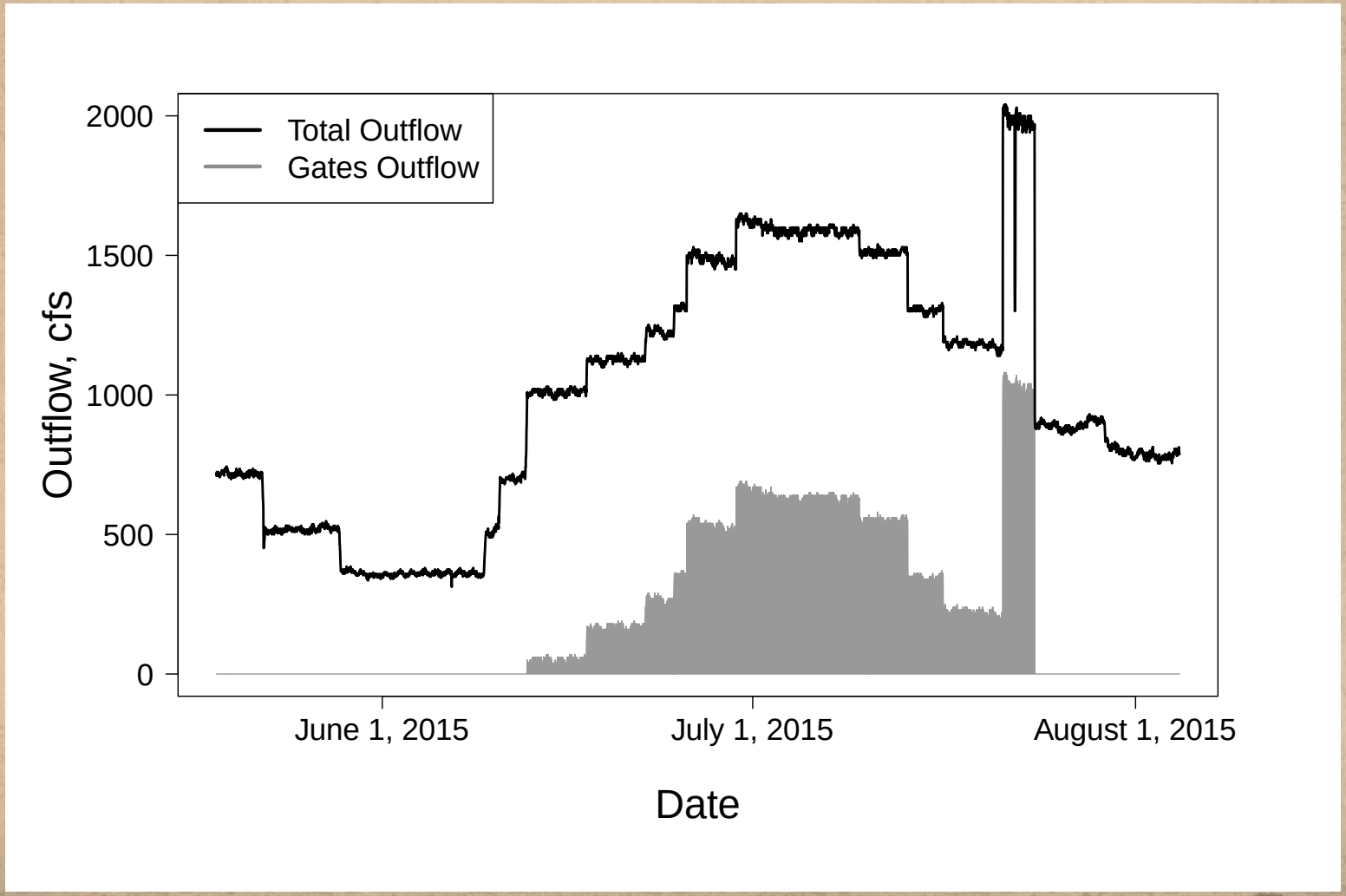


Depth profiles across time:

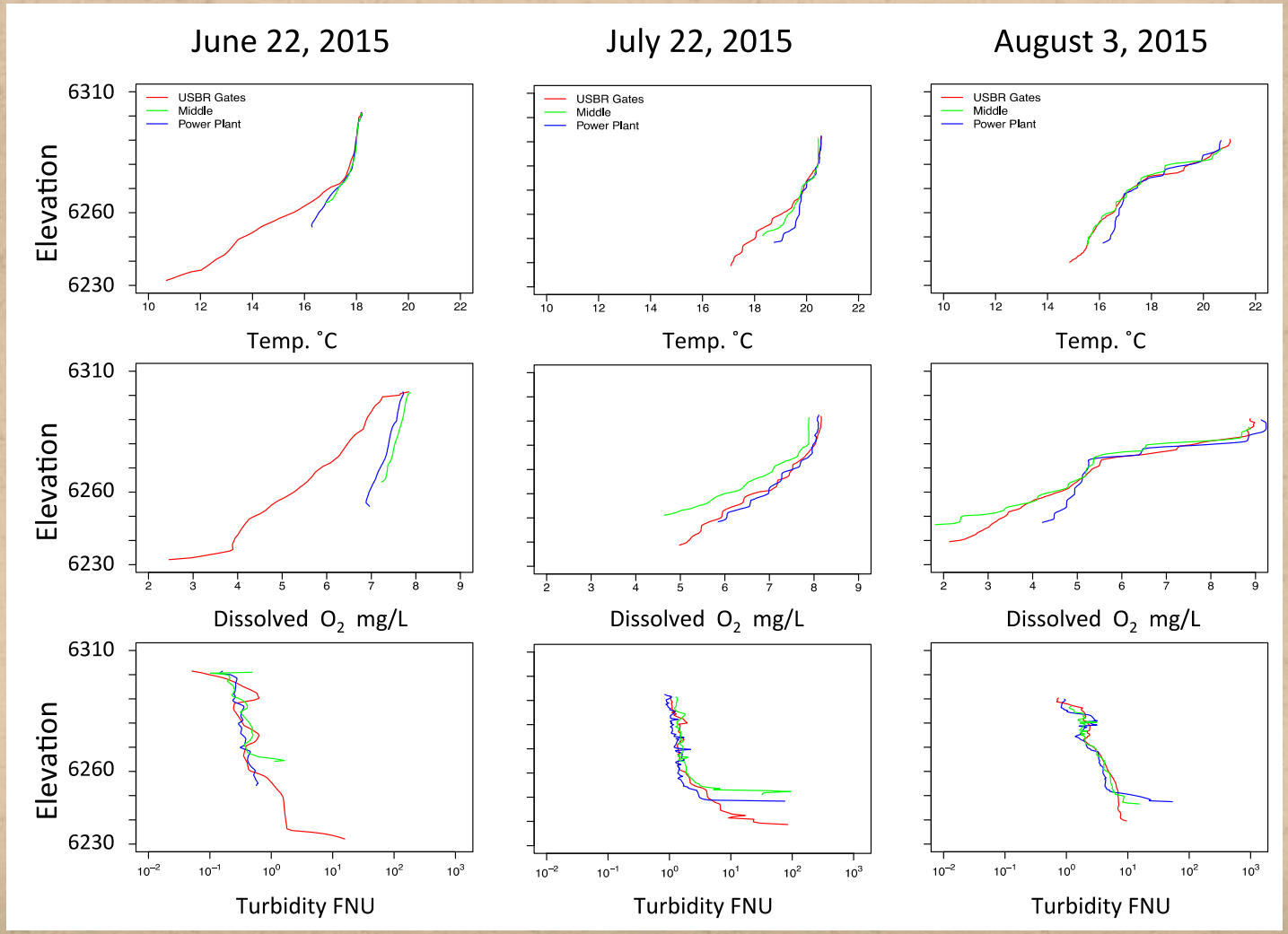
Changes at depth across time, not so across location



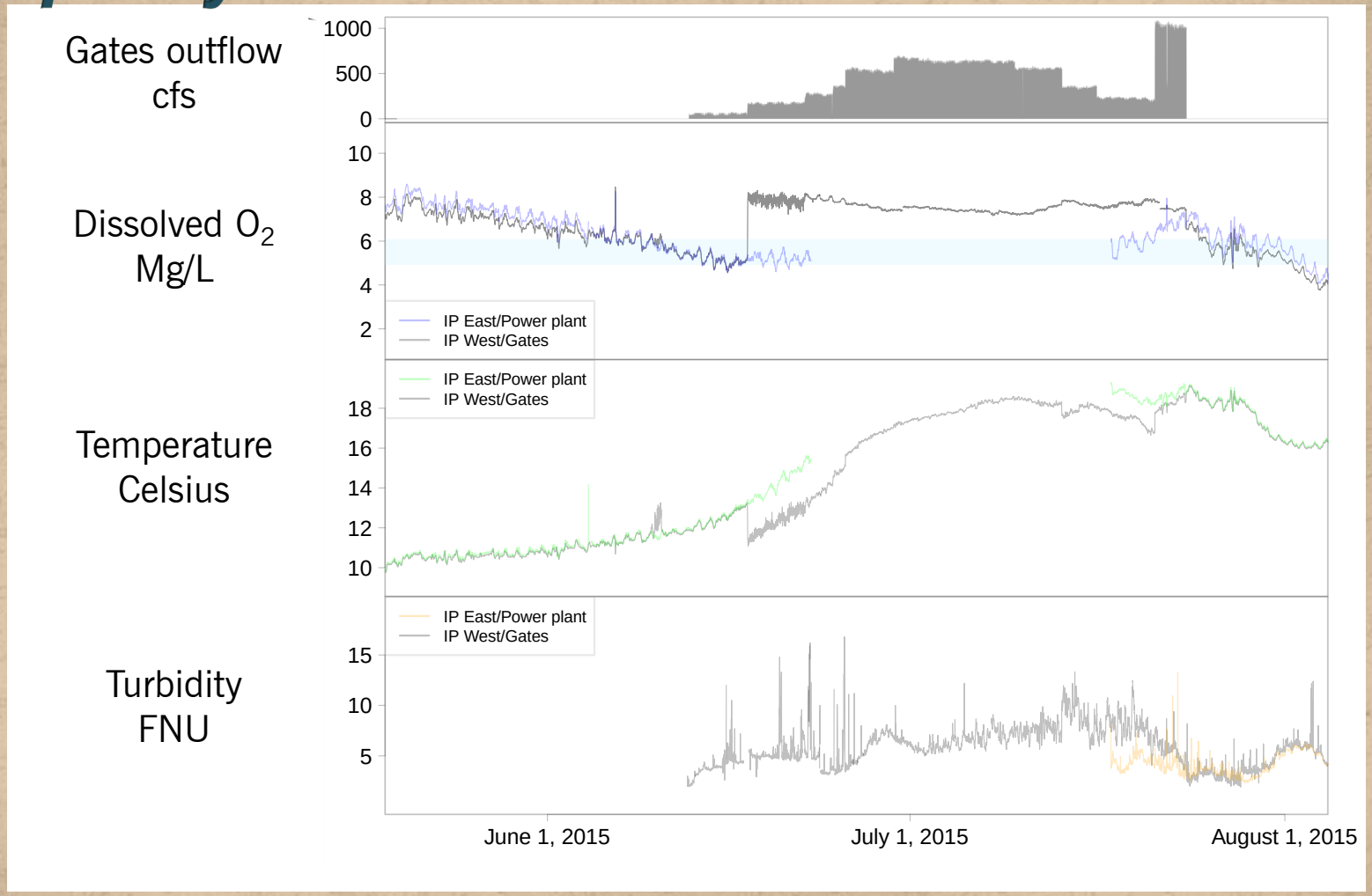
Summer outflow in cfs



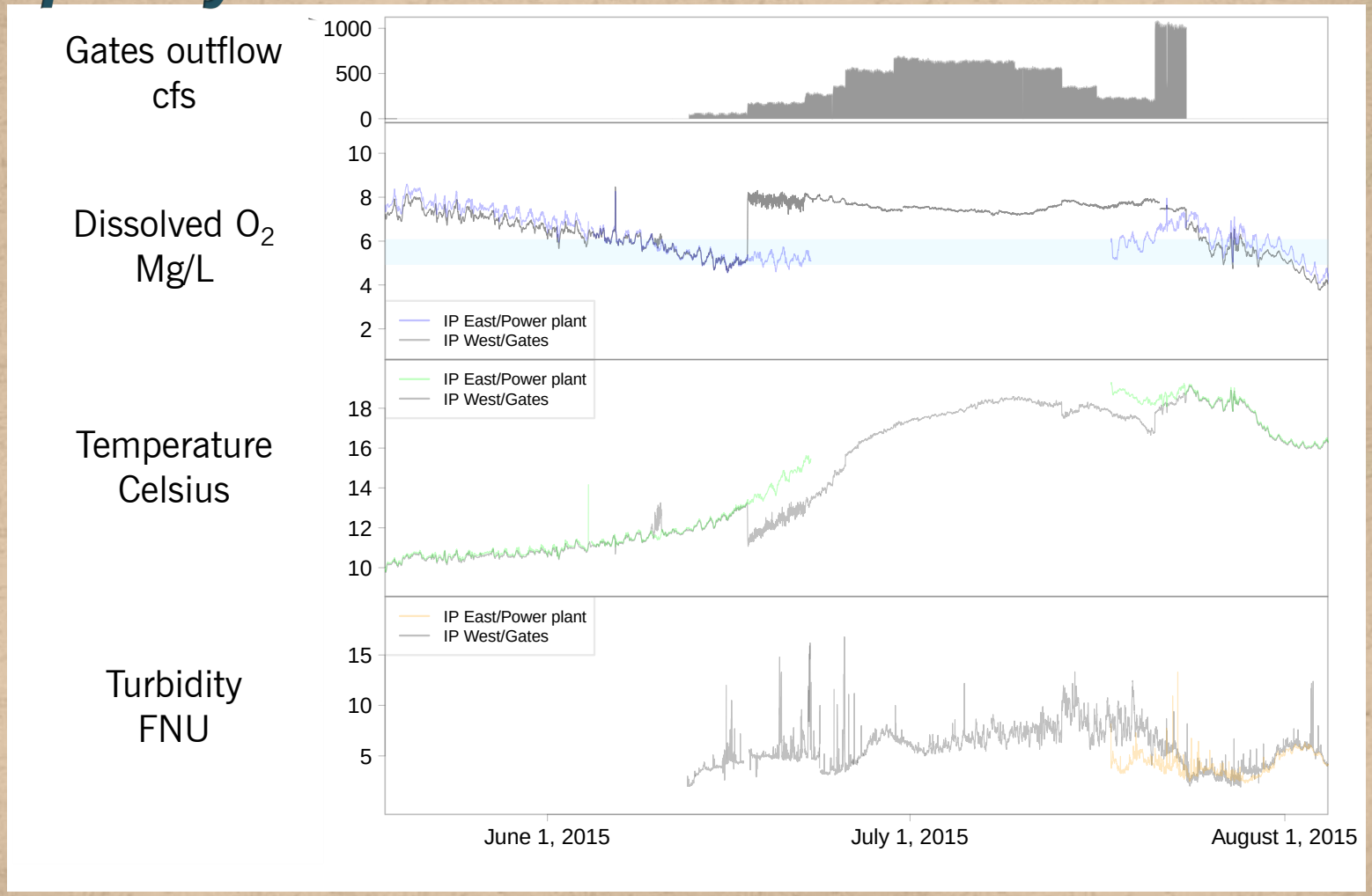
Depth profiles across time:
Greater outflow = less stratification



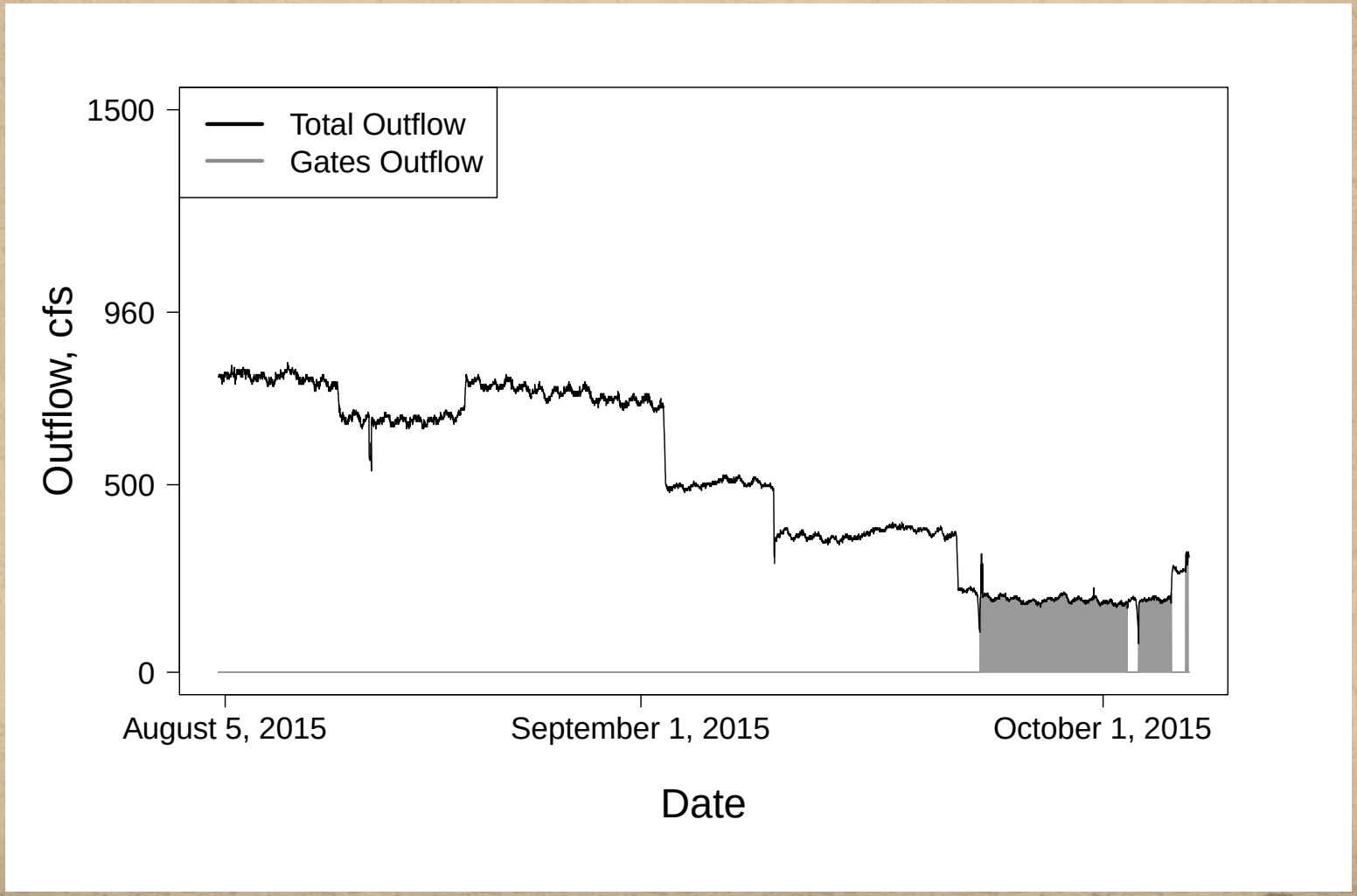
IP West versus IP East: higher outflow = better downstream quality



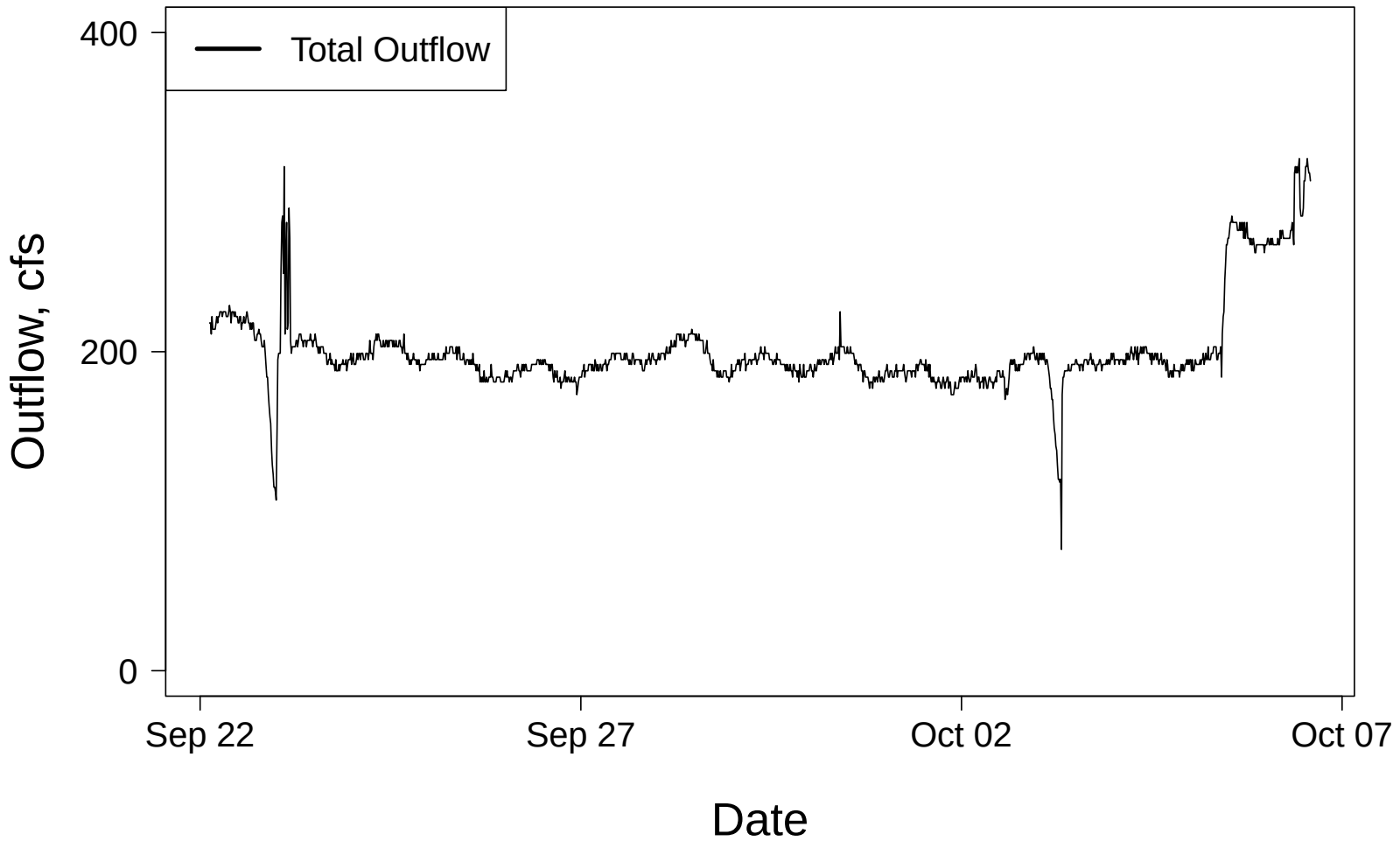
IP West versus IP East: higher outflow = better downstream quality



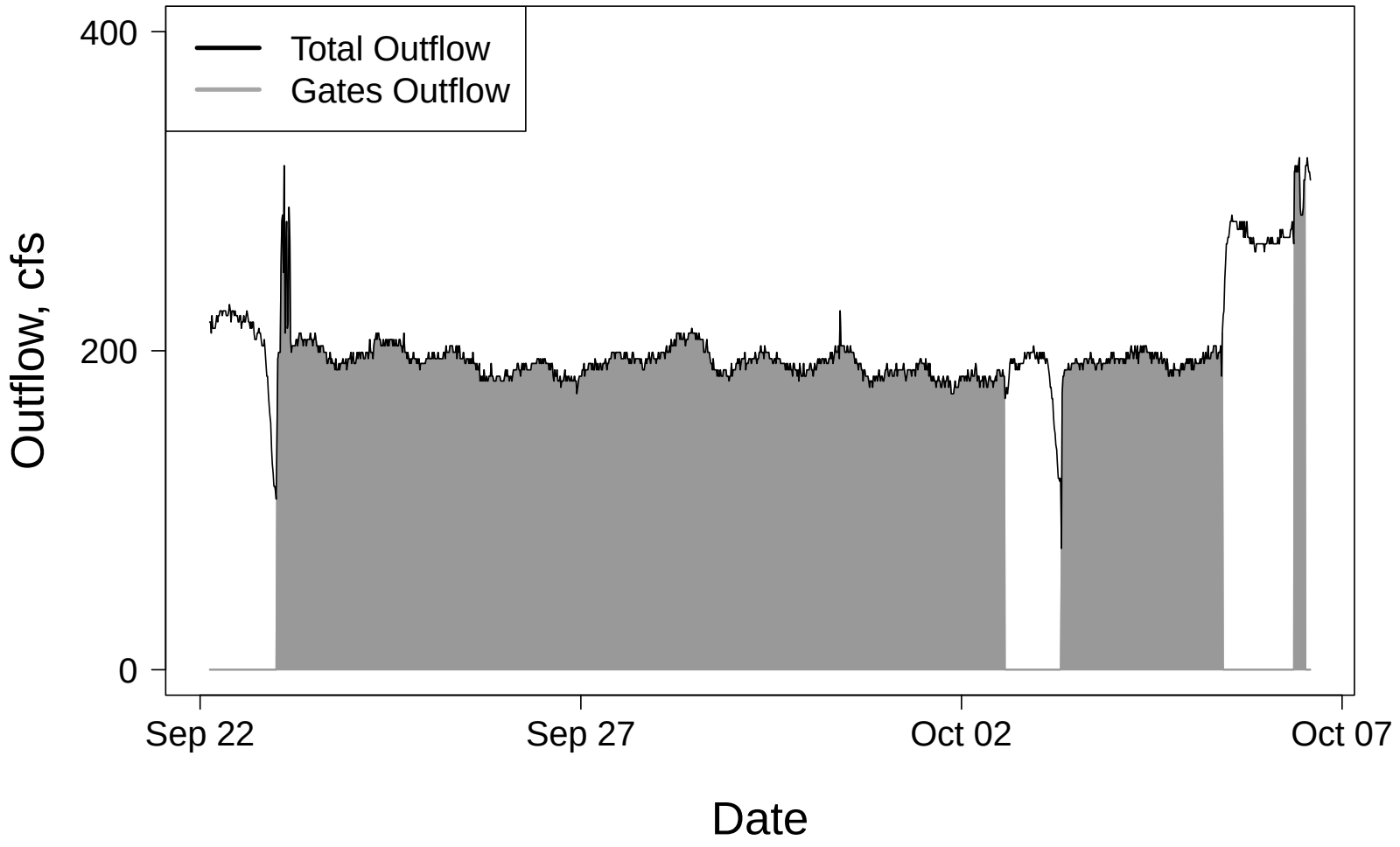
Late summer/fall outflow in cfs



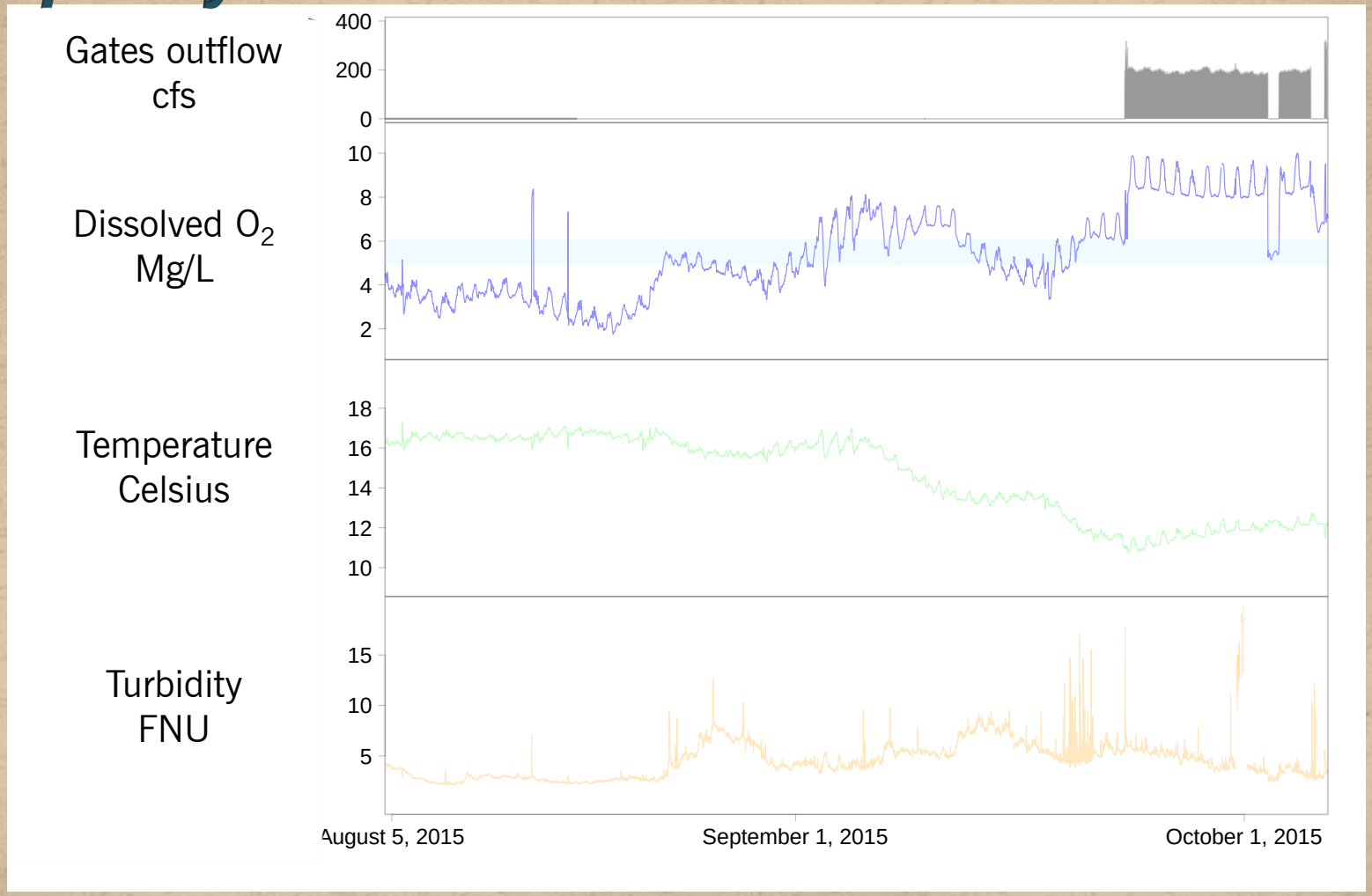
3 failures of the power plant:



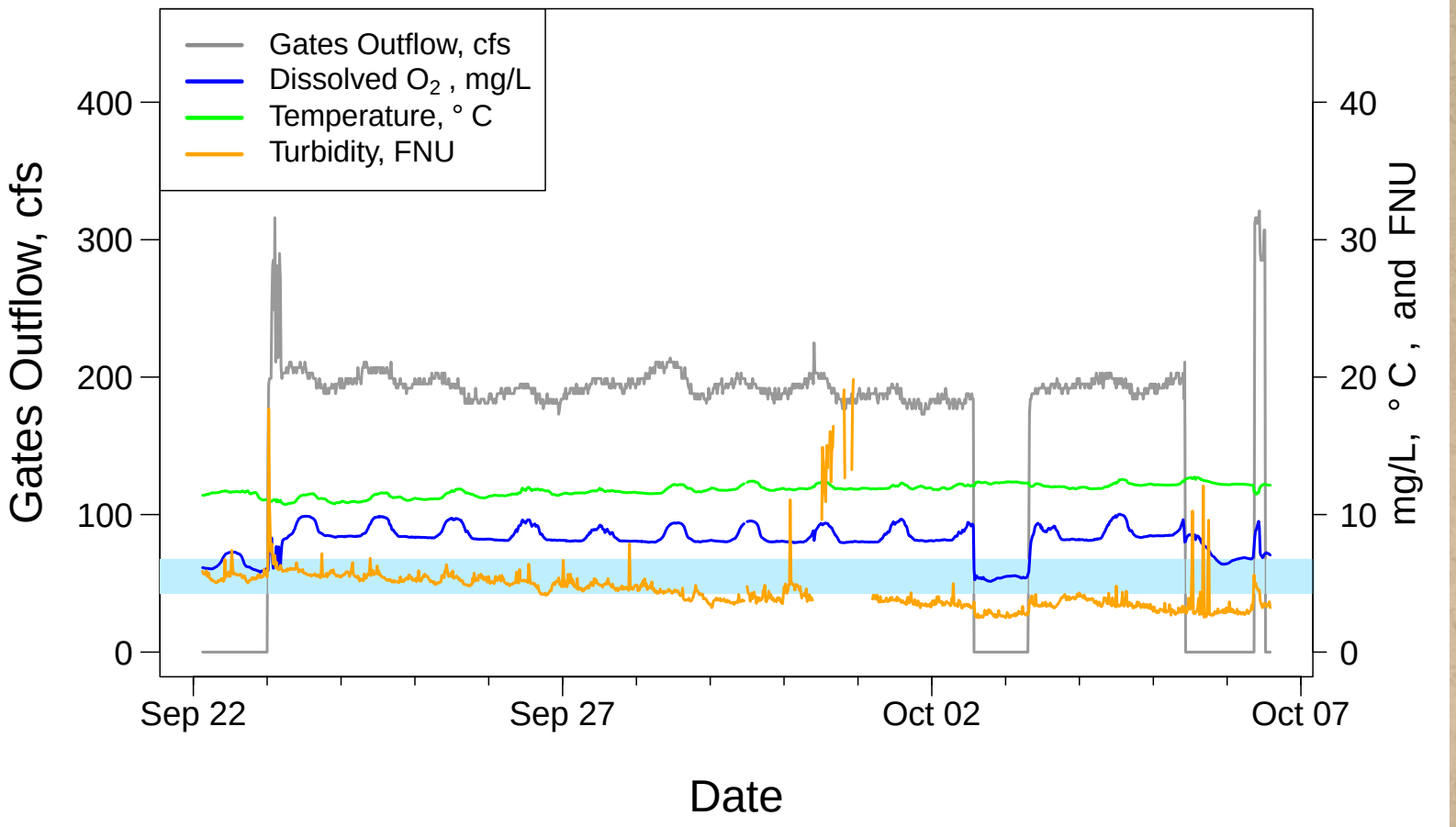
3 periods, total flow out of gates:



IP East in the fall: Gates outflow = better downstream quality



3 confirmations of the impact of gates outflow > 200 cfs



Conclusions

- Higher gates outflow > 200cfs results in improved summertime water conditions for trout; lower temperatures and higher dissolved oxygen.
- Minimal increases in turbidity caused by increased flow early in the irrigation season.
- Minimal increases in turbidity late in the season as reservoir inflow < outflow.
- Higher gates outflow > 200cfs results in higher dissolved oxygen at any time of year with minimal impact on turbidity. *

Downstream of IP Dam June 30, 2015

July 9, 2015

Downstream of IP Dam July 28, 2015