IDAHO Department of Water Resources

AADF: Lag Time Estimates CJ to Big Foot Bar: Does Aquatic Growth Control the Lag?

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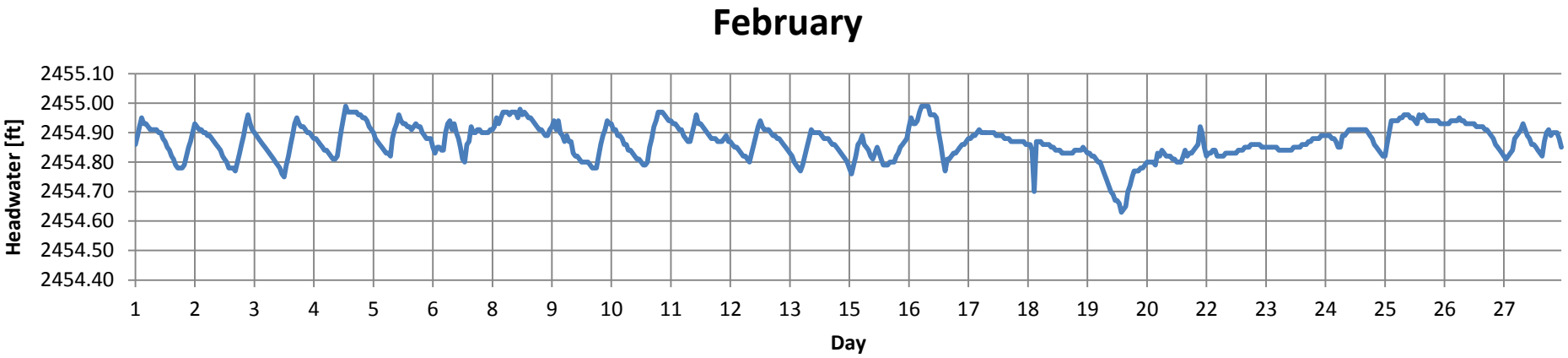
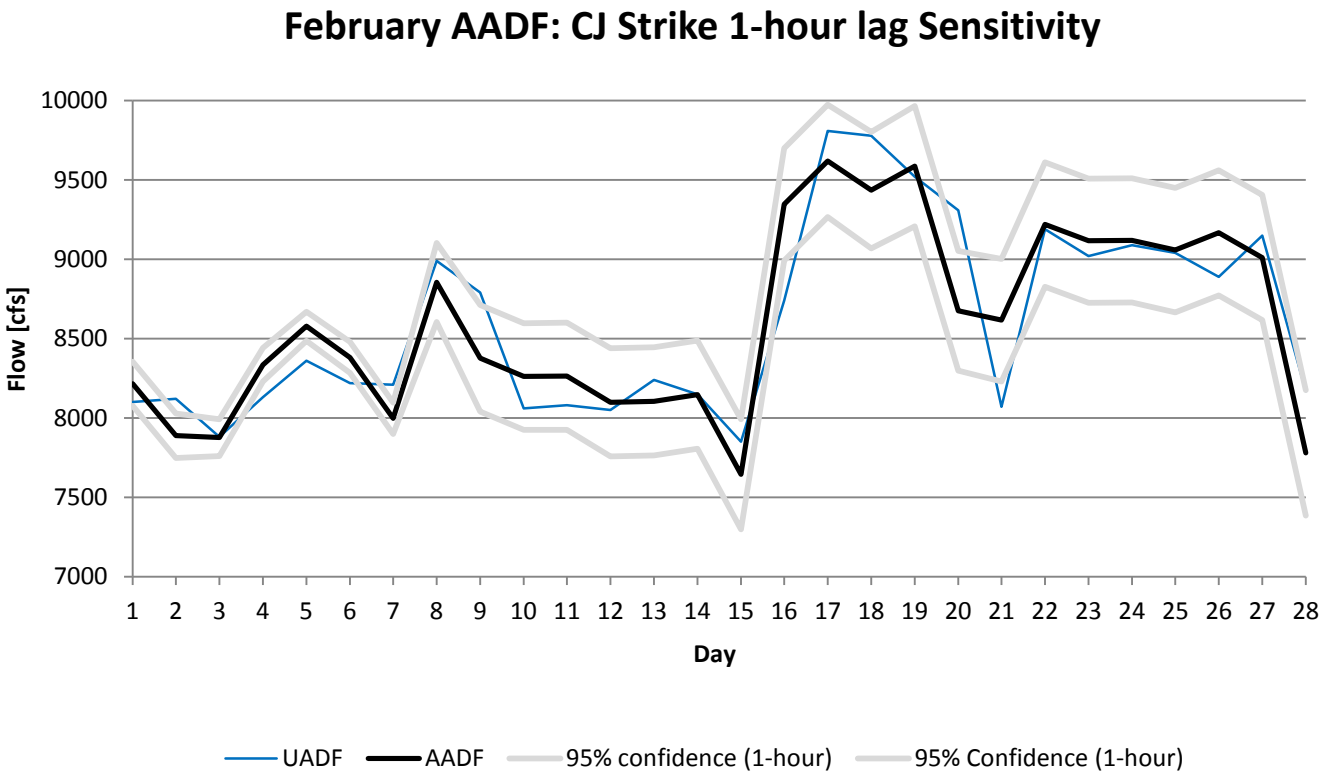
Outline for Presentation

1) Lag Matters on CJ

2) Analysis of Lag in 2015

3) Discussion





The Main Point:

The difference in the adjusted daily values caused by a 1-hour lag is often greater than the daily adjustments.

Estimated Lags for the AADF Calculation Jan. thru Aug. 2015

1) Swan Falls—2 hrs

2) CJ Strike—10 hrs (Lag matters on CJ!!!!!!)

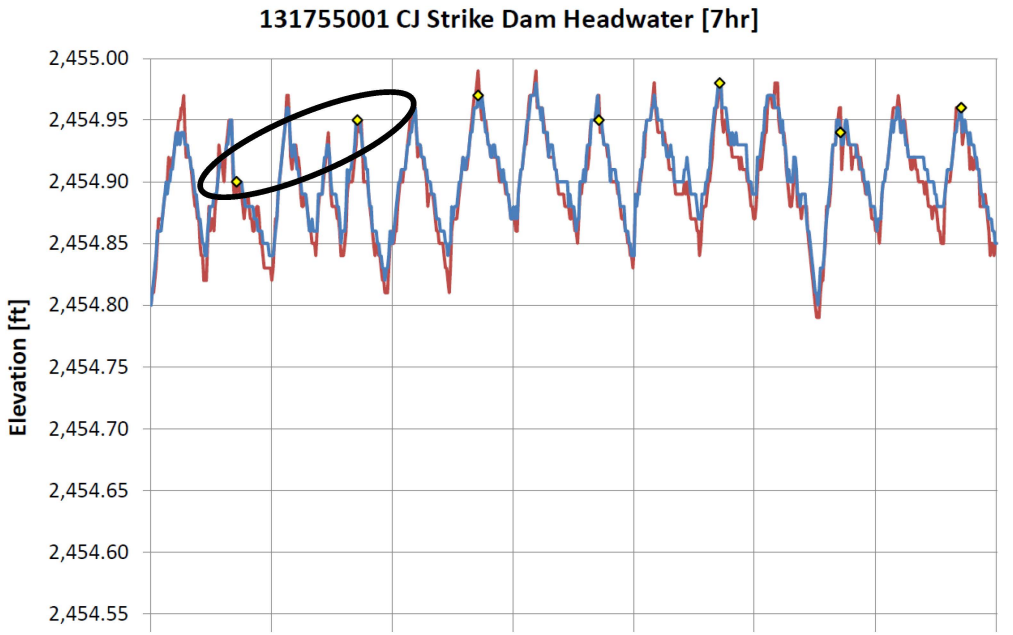
3) Bliss—33 hrs

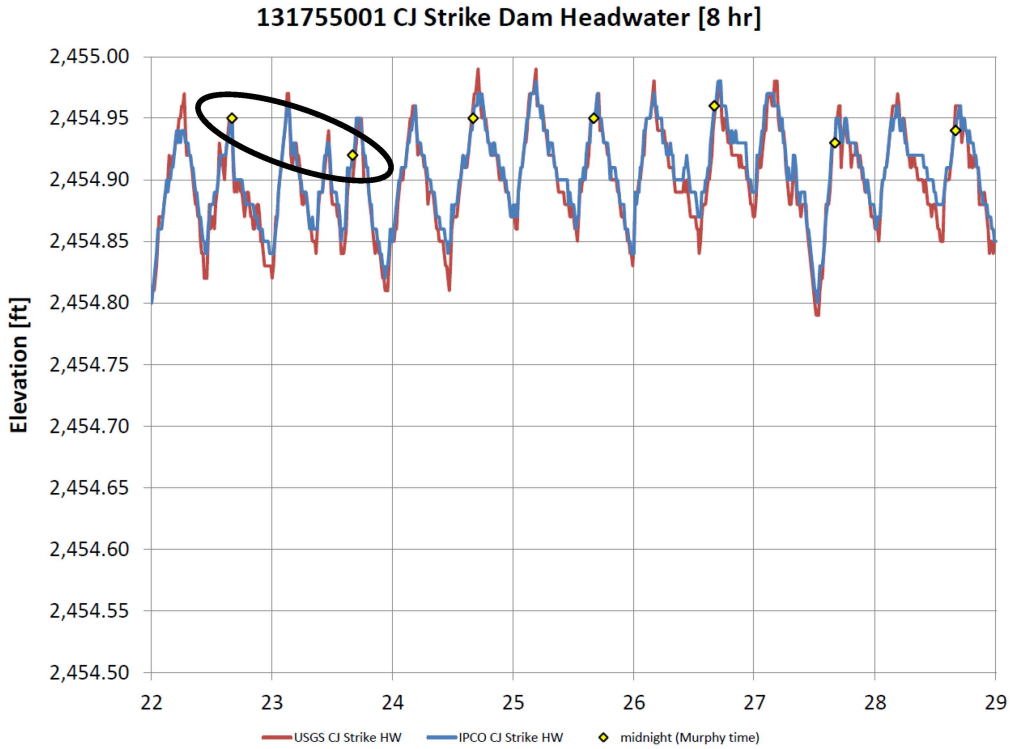
4) Lower Salmon Falls—35 hrs

95% Confidence Interval (2 Standard Deviations)

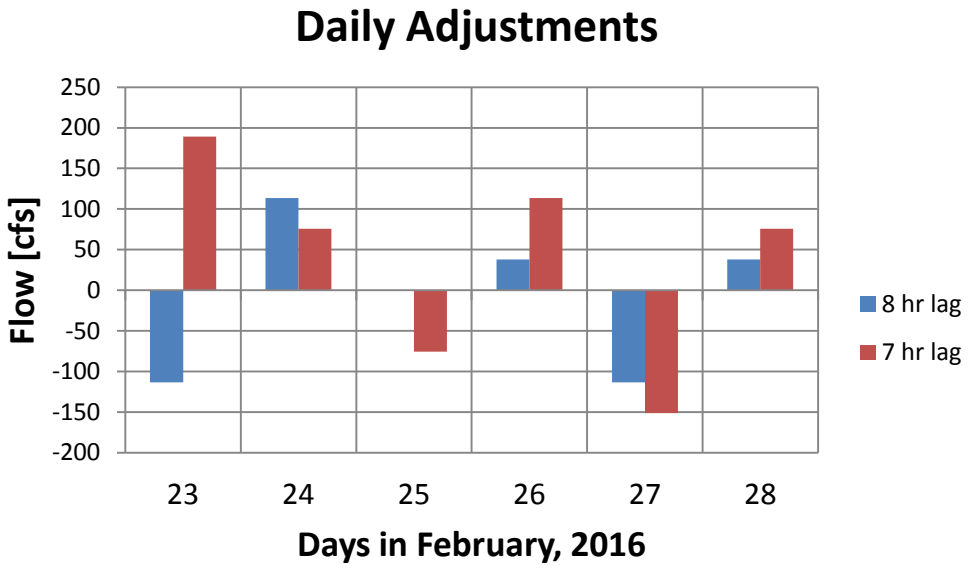
[cfs]	**Swan Falls**	**CJ Strike**	**Bliss**	**LSF**
1-hour lag	± 57	± 157	± 7	± 21
2-hour lag	--	± 239	± 11	± 33

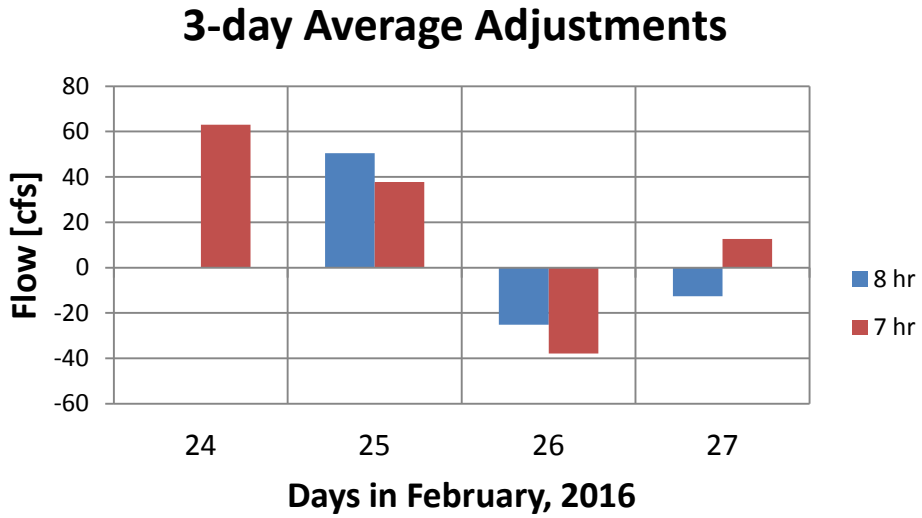
The Main Point:
The difference in our daily adjustments over a 9-month period were very significant only at CJ Strike Dam.





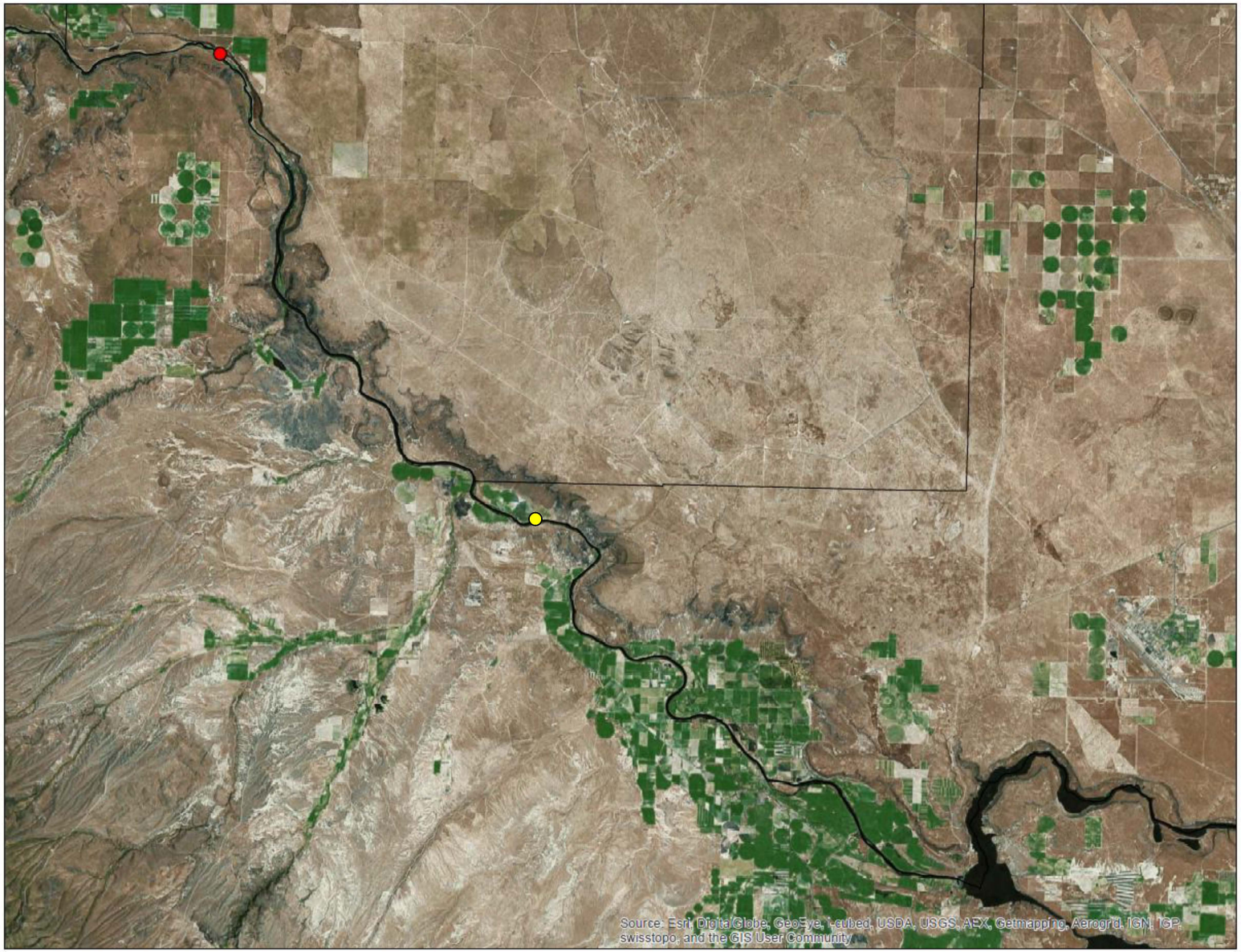
The Main Point:
When the reservoir is passing through sub daily turbine cycles, the timing of the lag is important. Being off by an hour can change the sign of the reservoir adjustment.

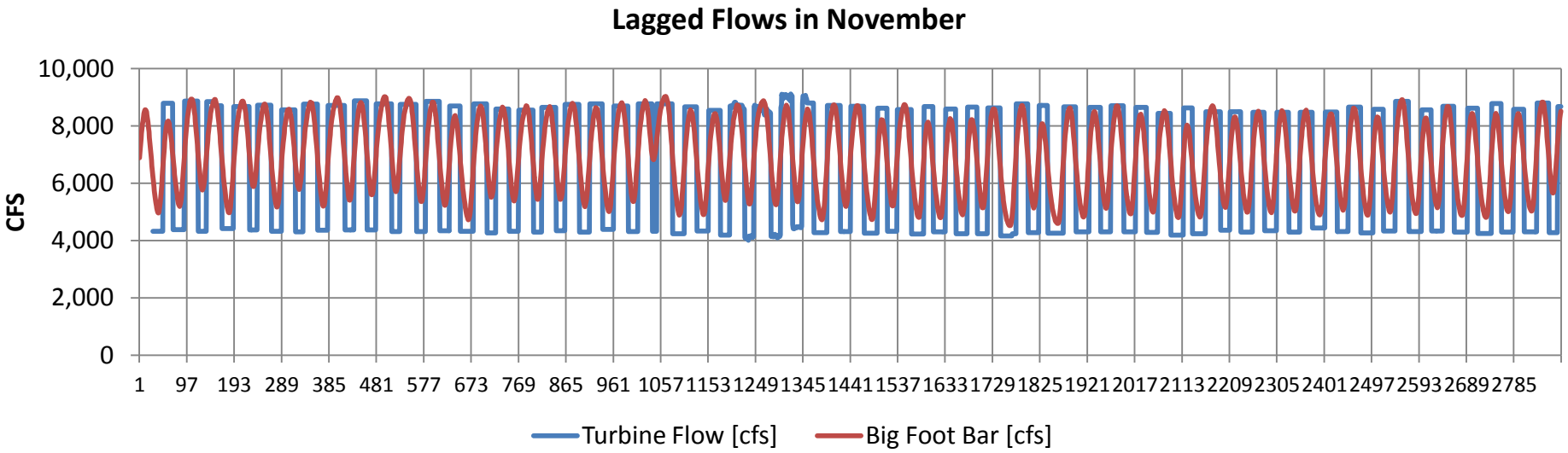


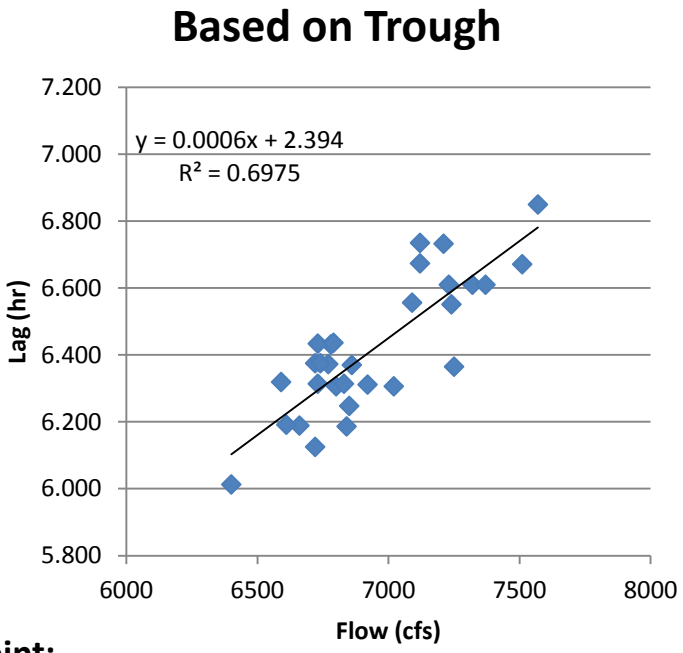


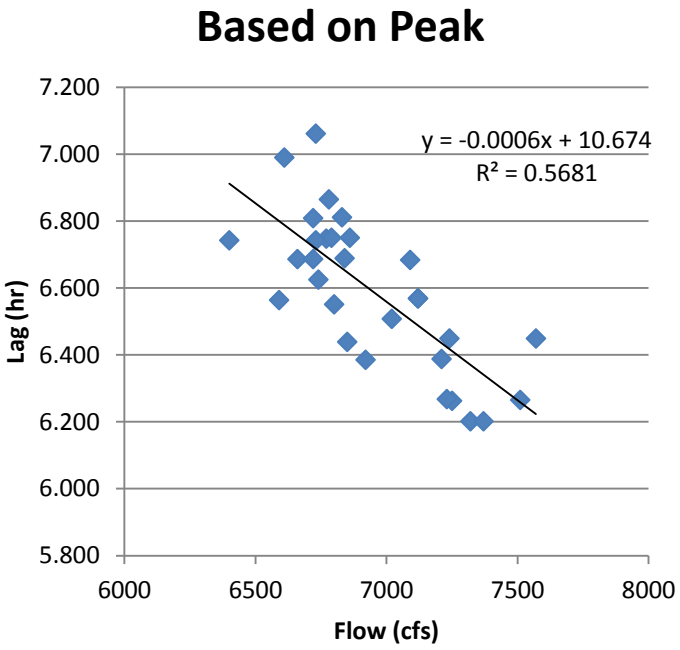
The Main Point:
Averaging significantly reduces the adjustment. Are the adjustments we are applying less than the uncertainty in our calculation?

Analysis of Lag from CJ Strike to Big Foot Bar



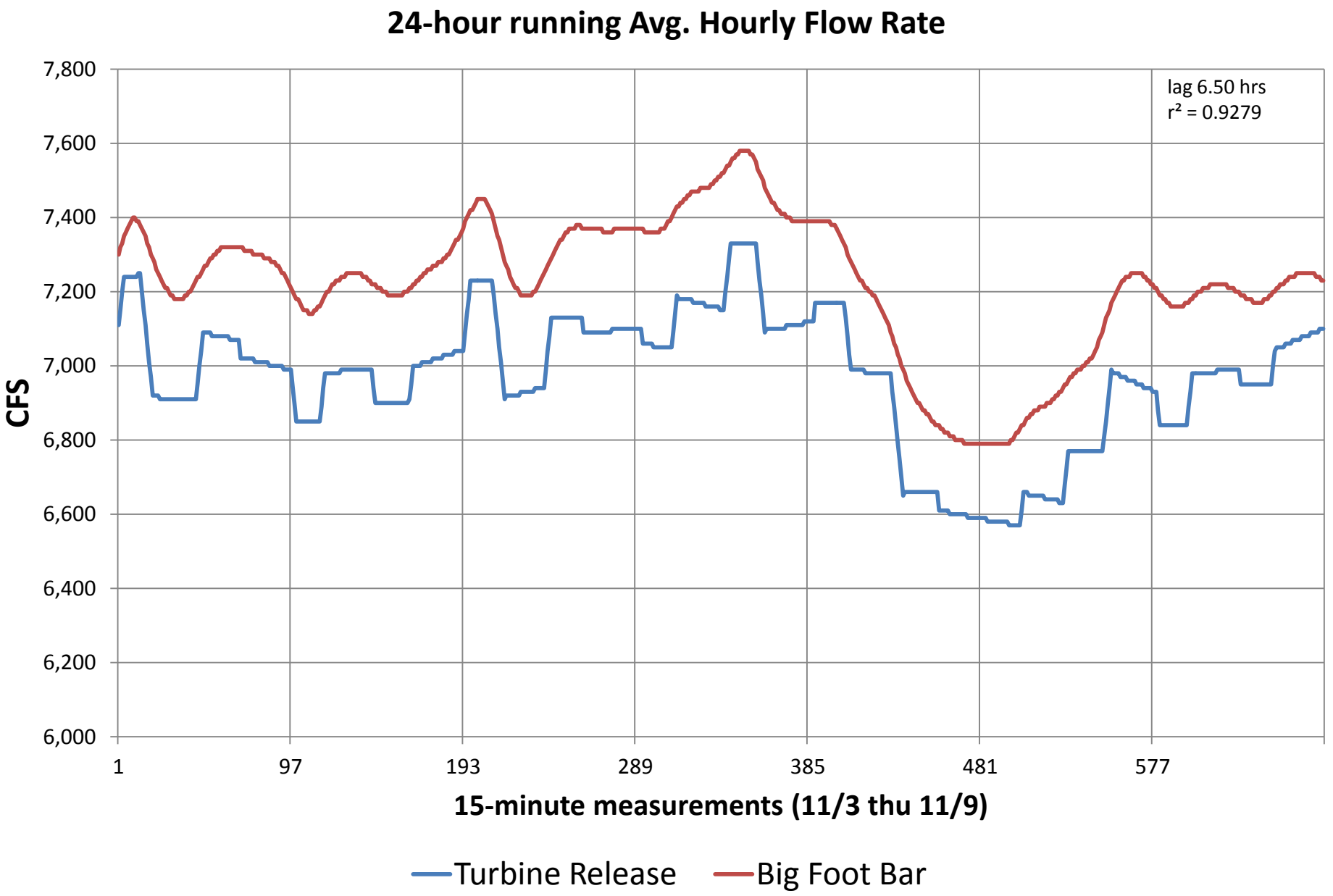






The Main Point:

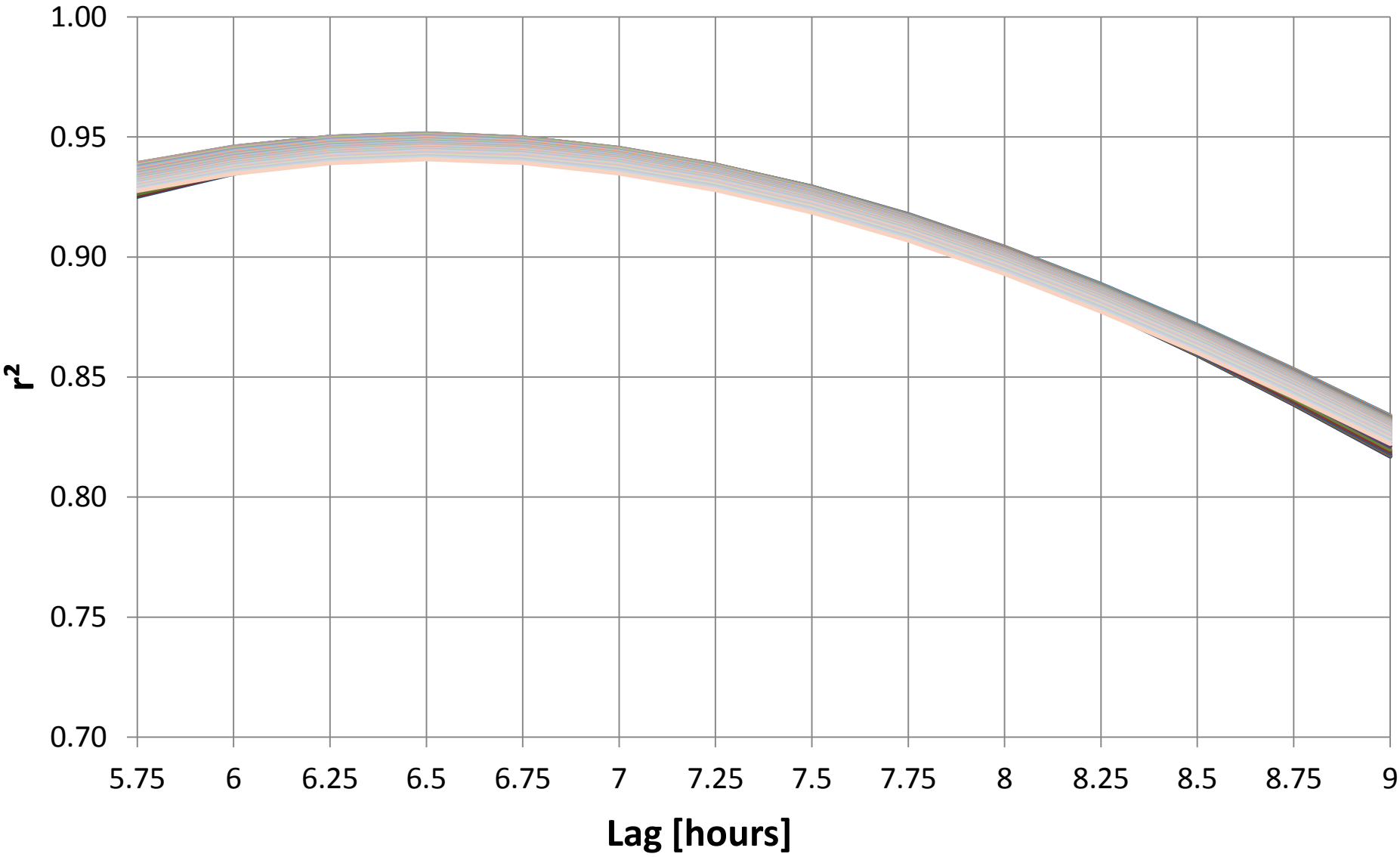
A peak to peak, trough to trough, or center of mass to center of mass analysis does not appear to be a reasonable way to determine lag since full attenuation does not occur between CJ Strike and Big Foot Bar.



The Main Point:

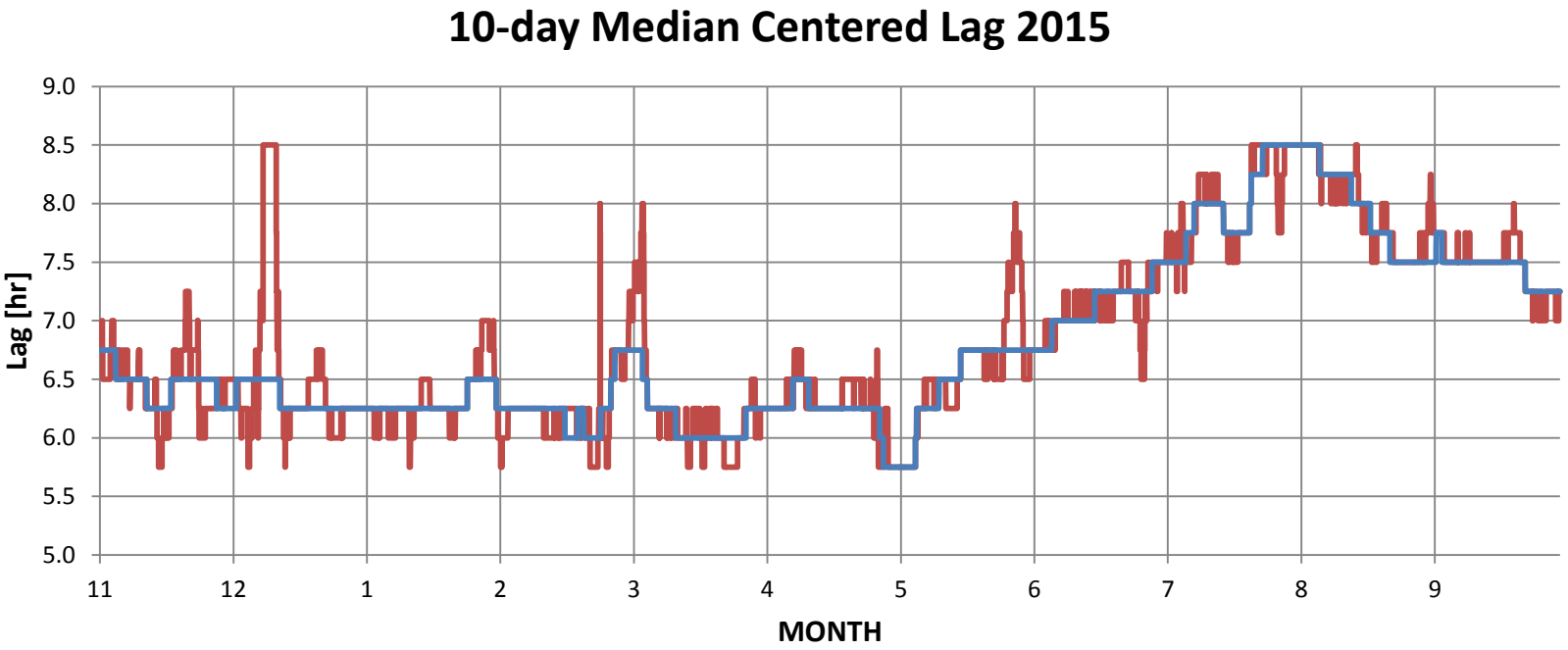
The 24-hour flow rate past the gages allows for an analysis that is perhaps a better representation of the lag.

November 6, 2015: 96 Lag Estimates over 24-hour period



The Main Point:

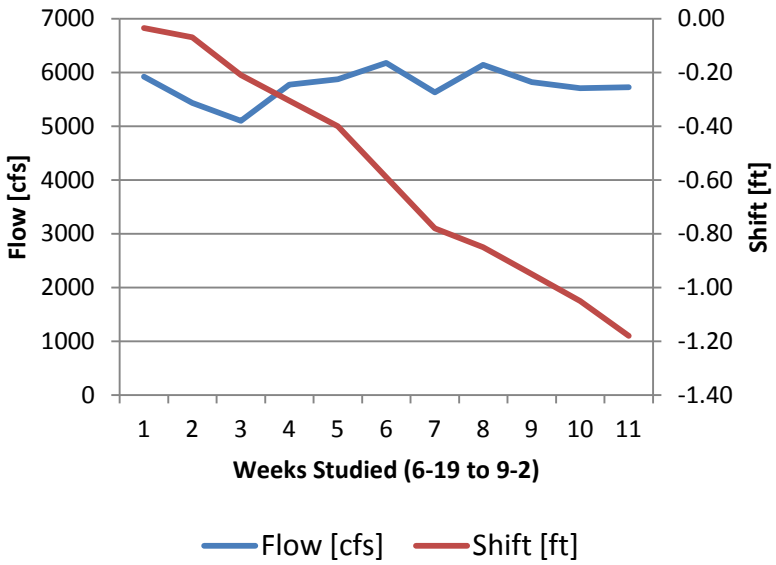
For the 24-hour period the lag is very consistent throughout the day and has an easily defined maxima.

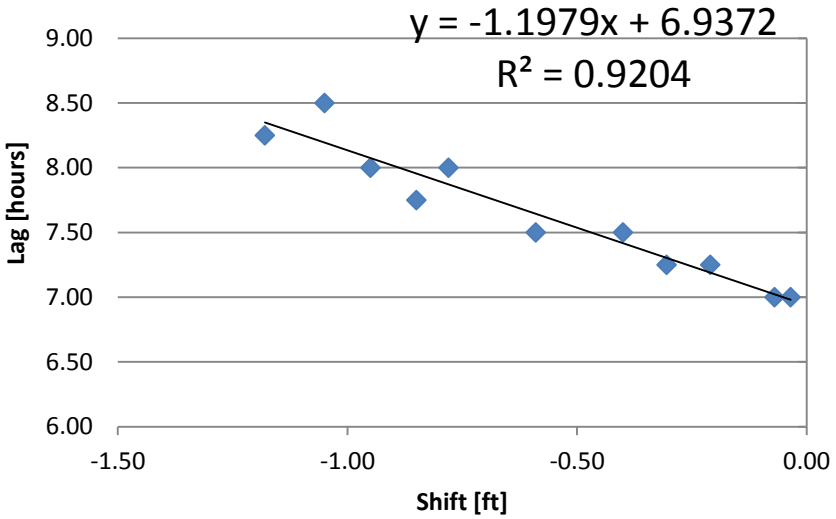


The Main Point:

In 2015 the lag began to increase at the beginning of May and peaked in August which seems to follow the pattern of aquatic growth as measured by the shift at the Murphy Gage.

The Shift at Murphy Correlates with the Lag





The Main Point:
The consistent flow rate, but increasing lag (which correlates with shift) seems to indicate that the greatest control on lag in 2015 was the aquatic growth in the river.

Conclusions

1) Lag Appears to be variable

2) In 2015 aquatic growth appears to control lag

3) **Discussion & Implementation**

- Any further analysis needed, or problems in methodology?
- Apply at Murphy Gage, by reconstructing flow into Swan Falls Reservoir.
- Should we consider lag adjustments this year?
- What level of reservoir fluctuation can we measure given lag and wind issues?