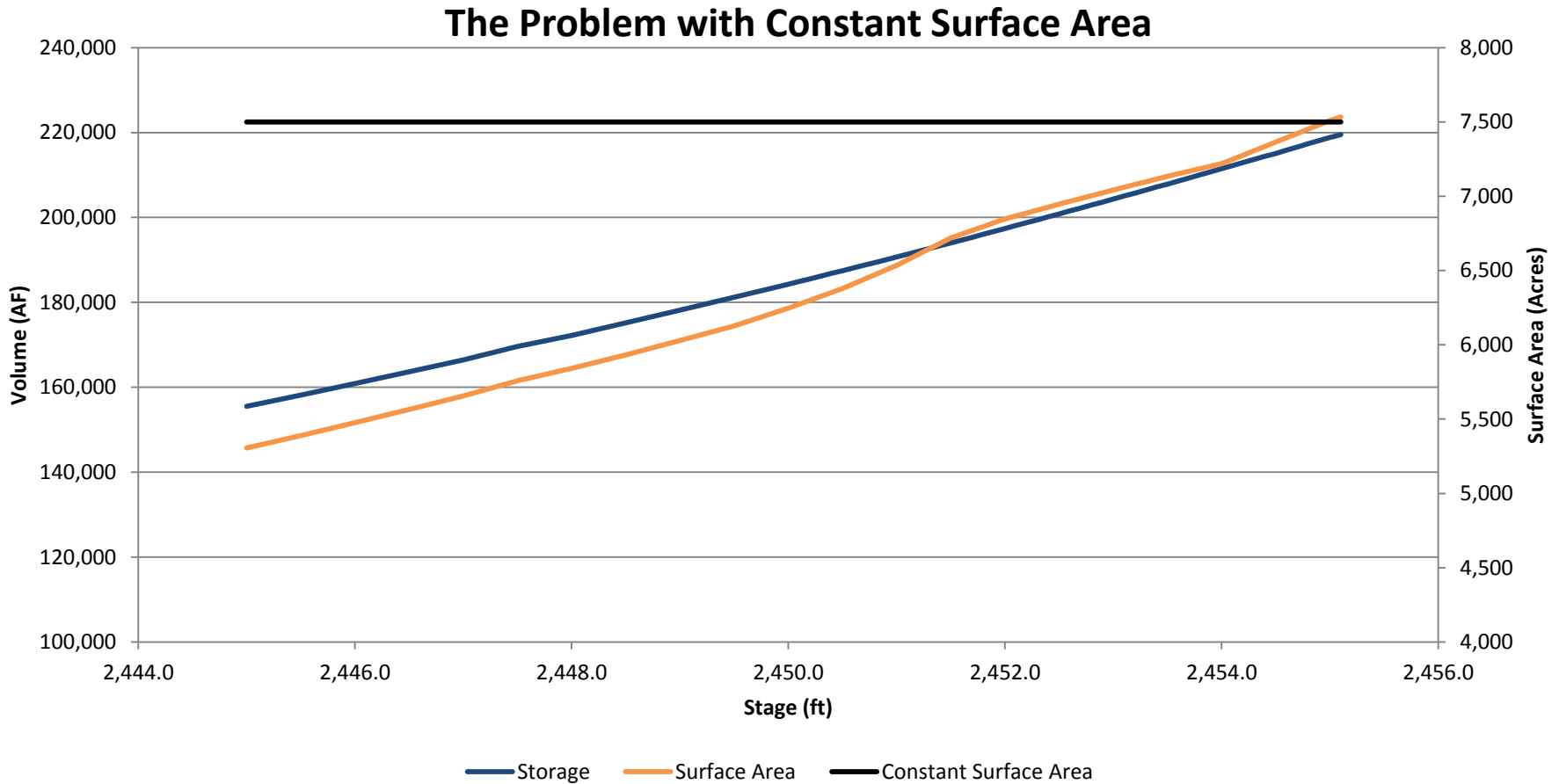


# Incorporation of Stage – Storage Relationship in AADF

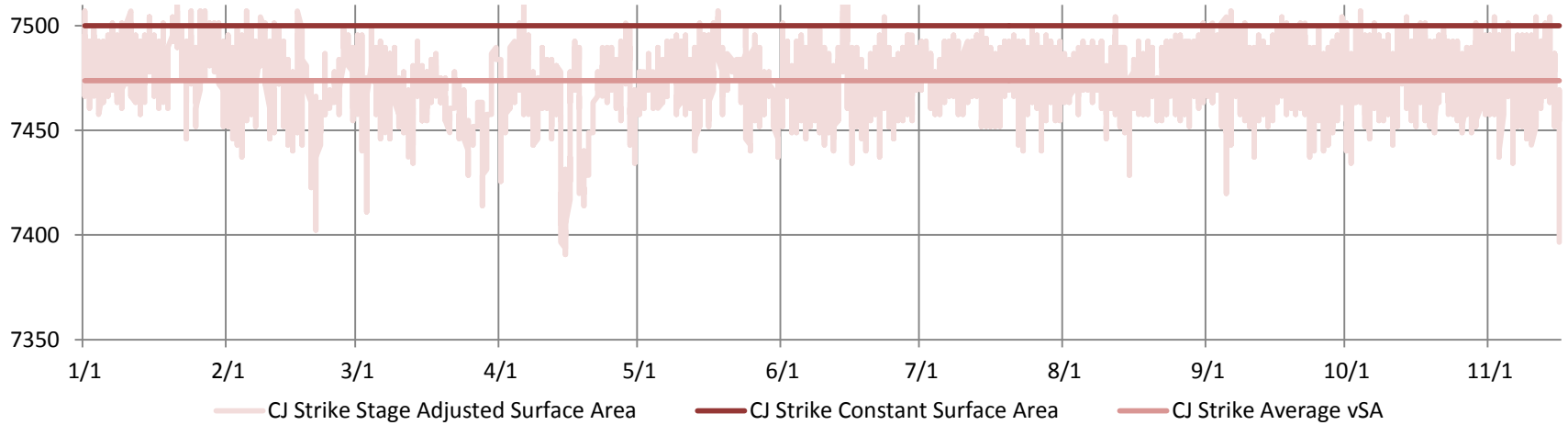
Dan Stanaway

Swan Falls Agreement Technical Work Group 12/1/2015

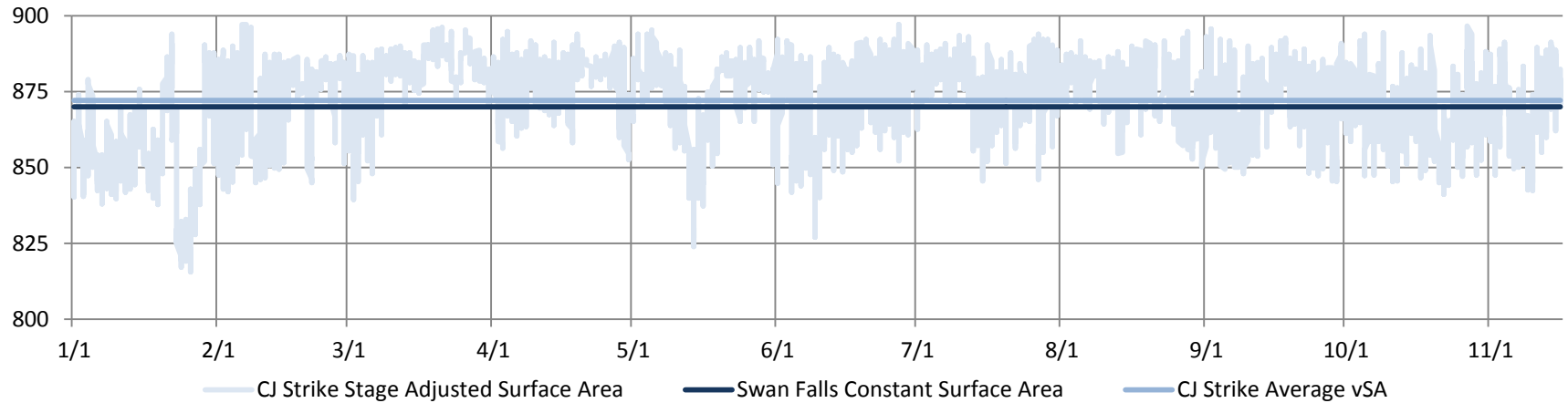
# Uncertainty of Current $\Delta$ Storage Method



## CJ Strike Constant Surface Area and Stage Adjusted Surface Area

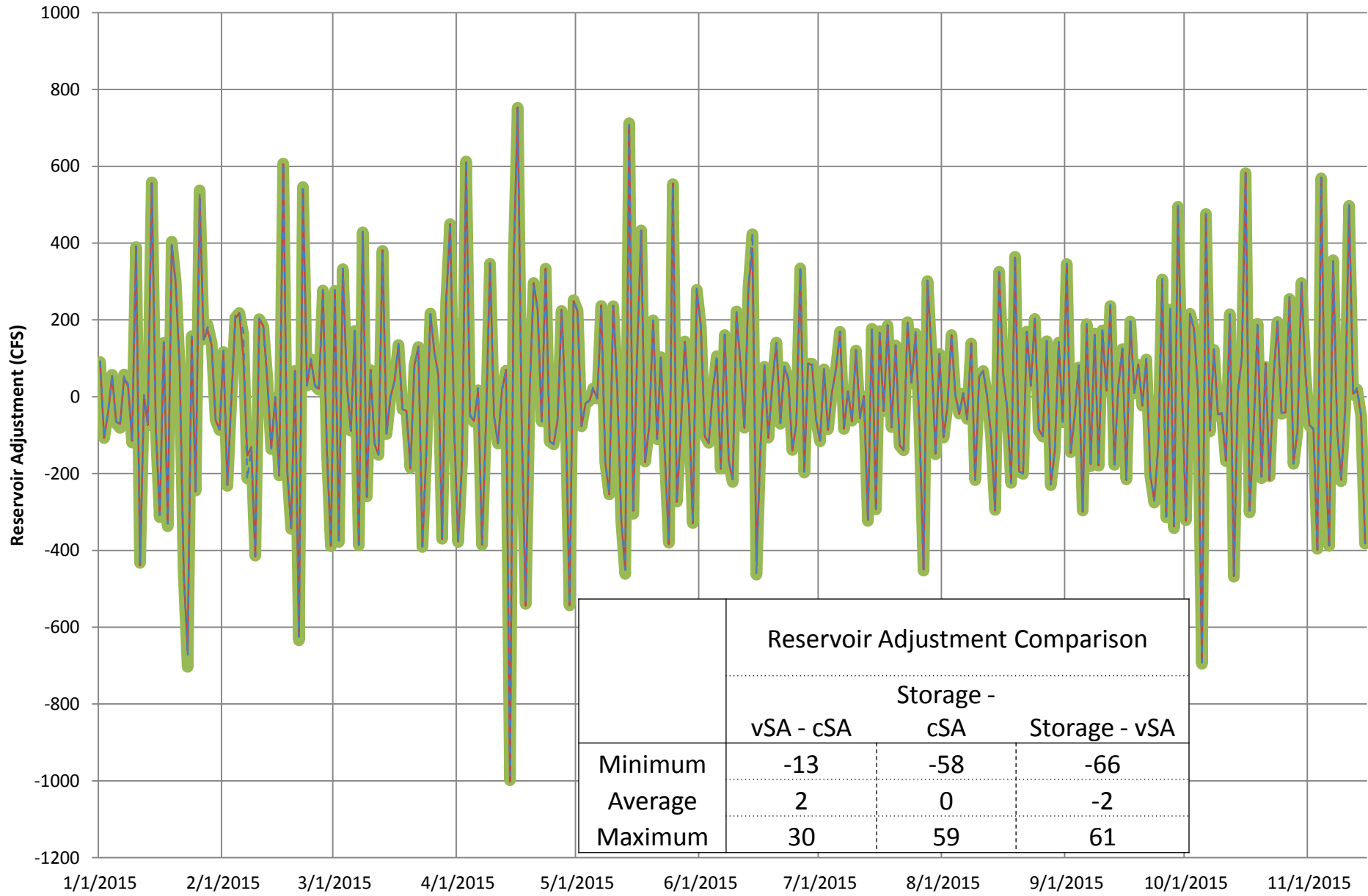


## Swan Falls Constant Surface Area and Stage Adjusted Surface Area



	Constant and Adjusted Stage Surface Area Comparison				
	Minimum SA	Average SA	Maximum SA	Average Error	Max Error
CJ Strike	7391	7474	7510	-26	-109
Swan Falls	816	872	897	2	-54

# Reservoir Adjustment Calculation Method Comparison

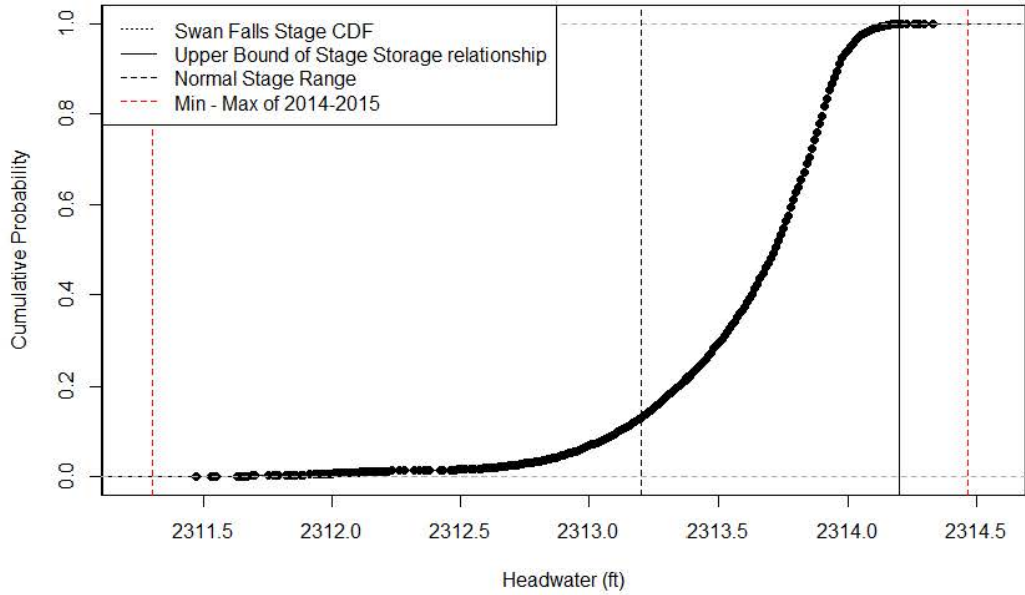


Reservoir Adjustment Comparison			
	Storage -		
	vSA - cSA	cSA	Storage - vSA
Minimum	-13	-58	-66
Average	2	0	-2
Maximum	30	59	61

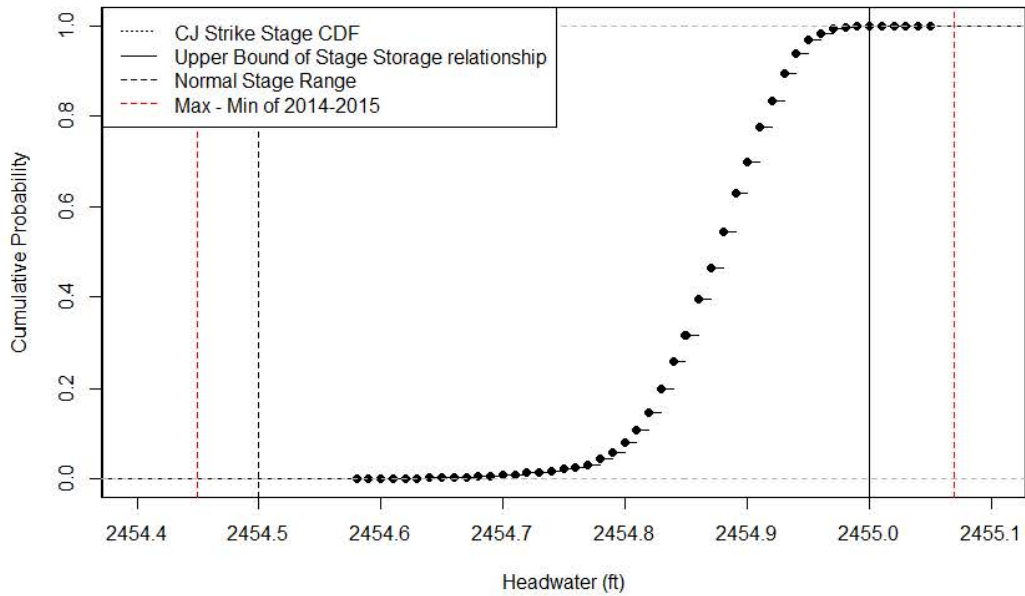
— 24 hr Reservoir Adjustment - Constant Surface Area  
- - - 24 hr Reservoir Adjustment - Stage Adjusted Surface Area

— 24 hr Reservoir Adjustment - Stage Adjusted Storage

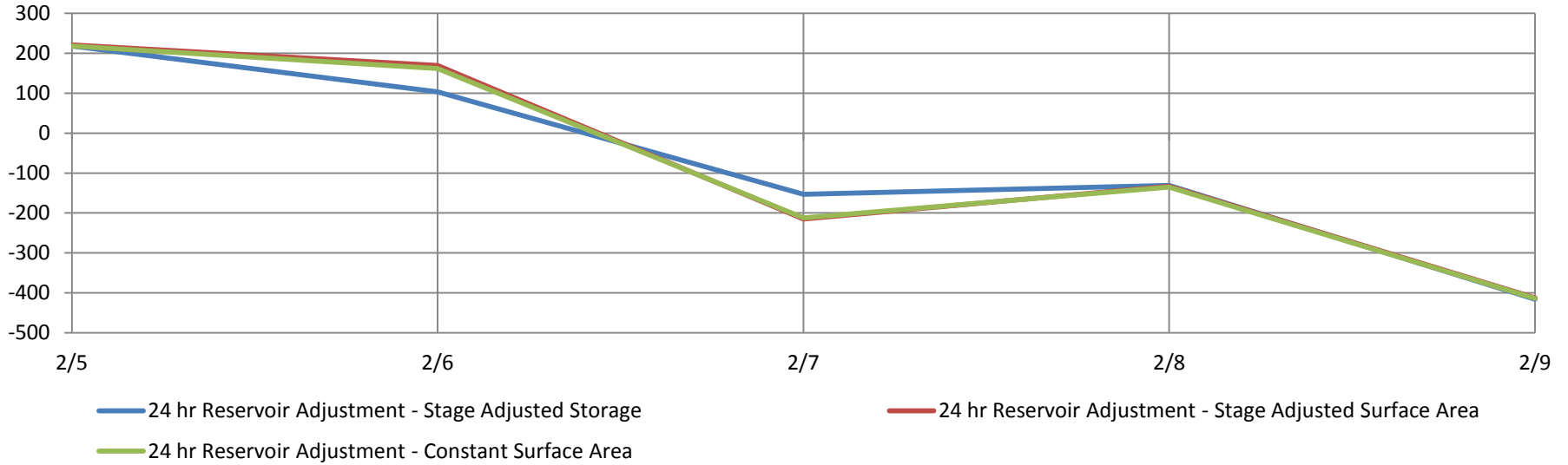
**Swan Falls Headwater Cumulative Distribution 2015**



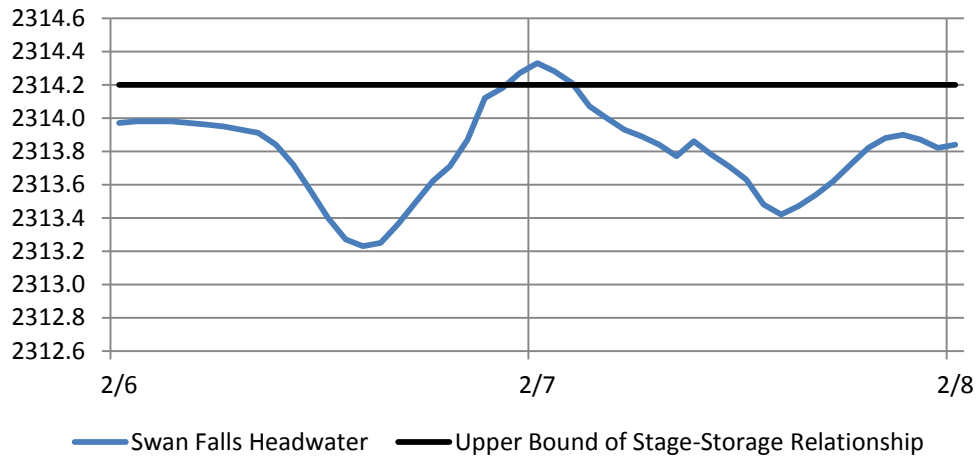
**CJ Strike Headwater Cumulative Distribution 2015**



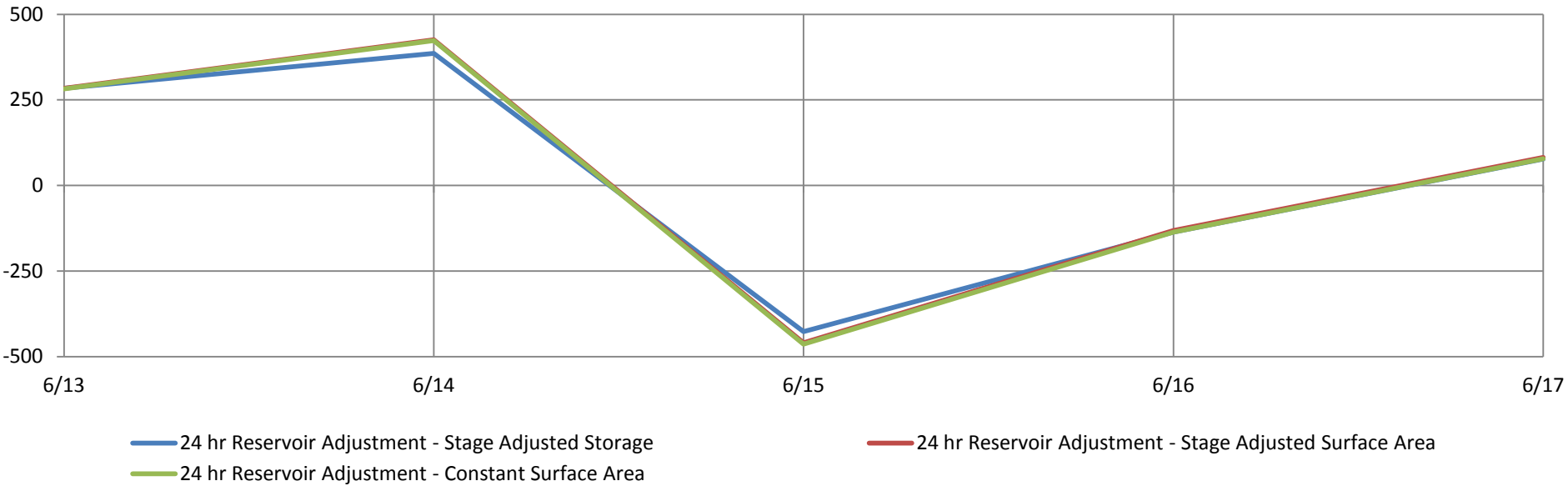
# Reservoir Adjustment Calculation Method Comparison



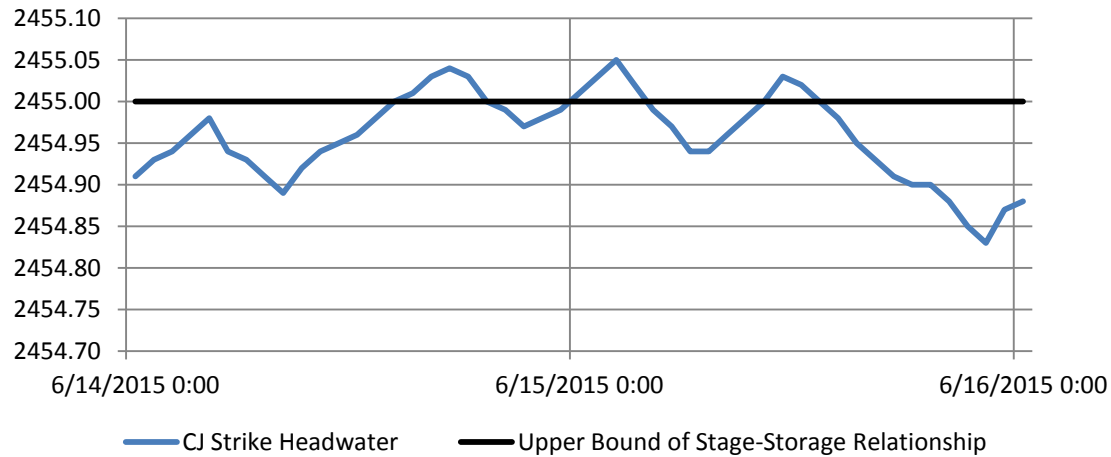
## Swan Falls Headwater



# Reservoir Adjustment Calculation Method Comparison

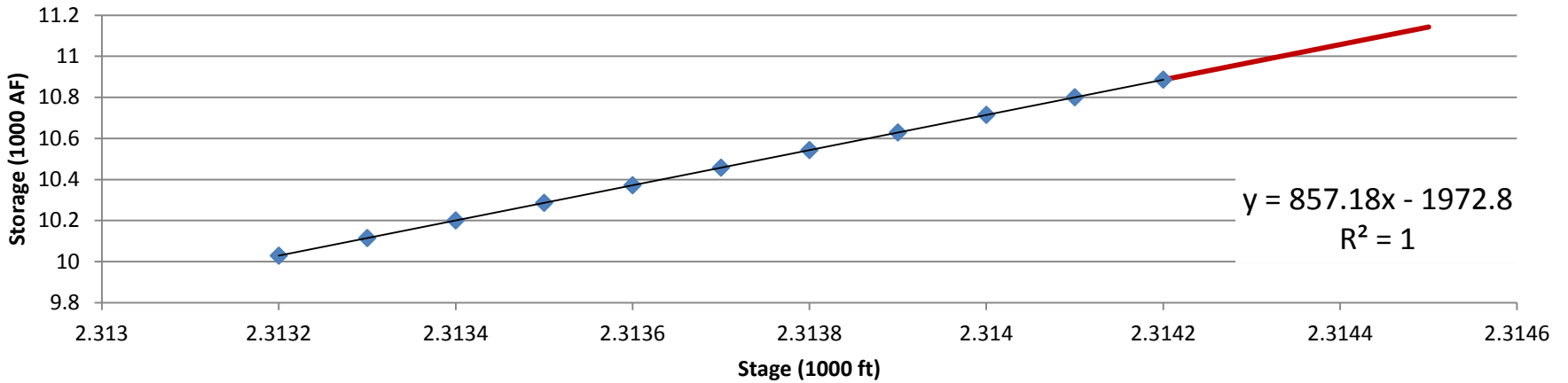


## CJ Strike Headwater



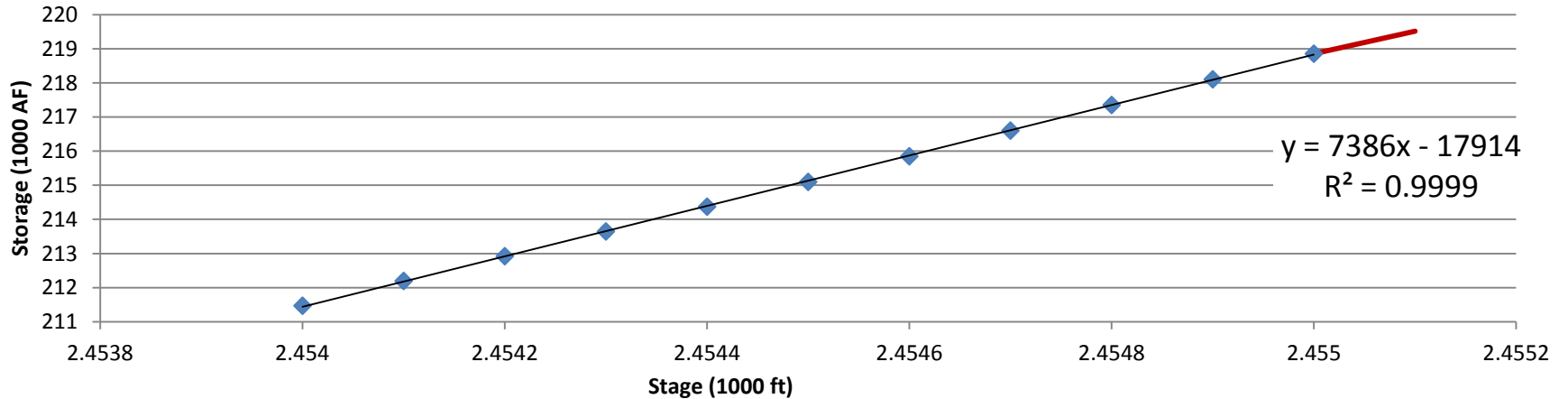


## Swan Falls Stage - Storage Relationship (2313.2 ft - 2314.5 ft)



◆ Swan Falls Stage-Storage Relationship (2313.2 ft - 2314.2 ft)

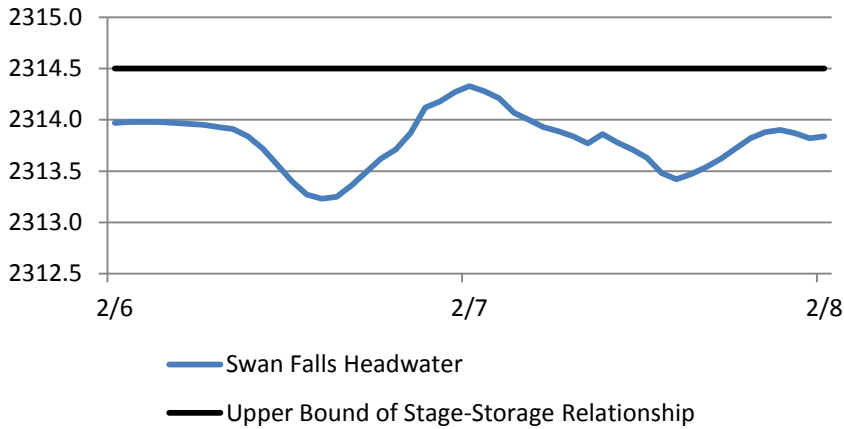
## CJ Strike Stage - Storage Relationship (2454.0 ft - 2455.1 ft)



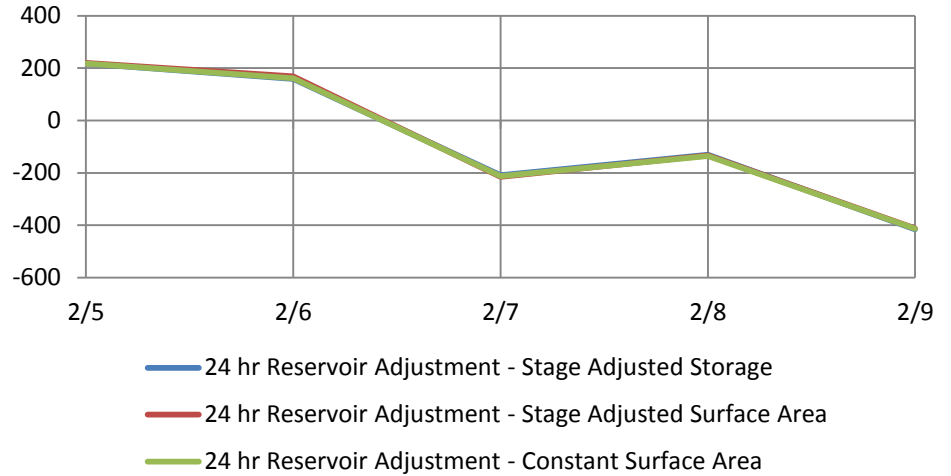
◆ CJ Strike Stage - Storage Relationship (2454.0 ft - 2455.0 ft)



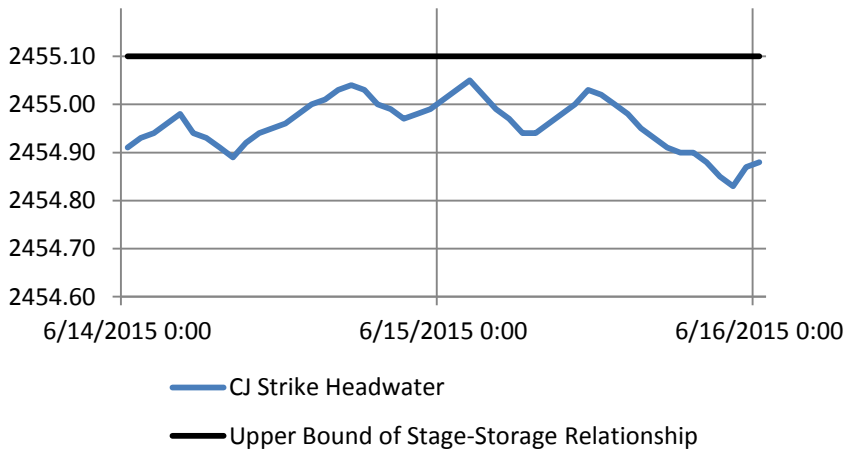
### Swan Falls Headwater



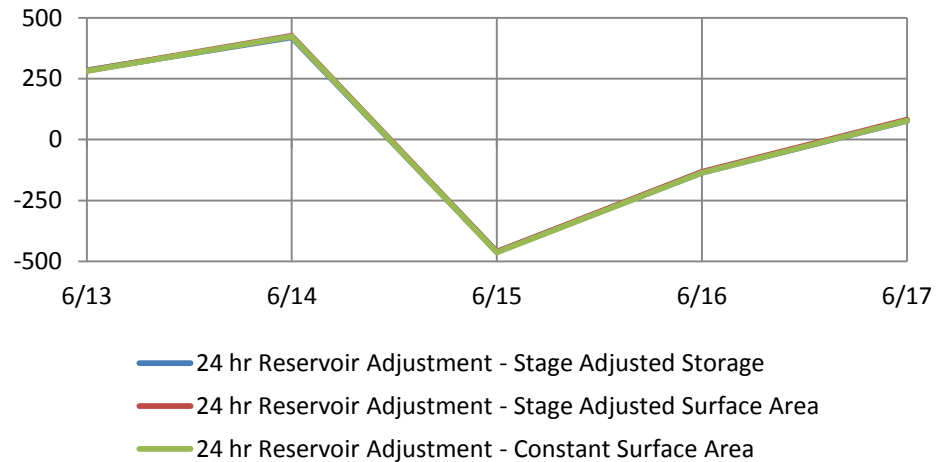
### Reservoir Adjustment Calculation Method Comparison



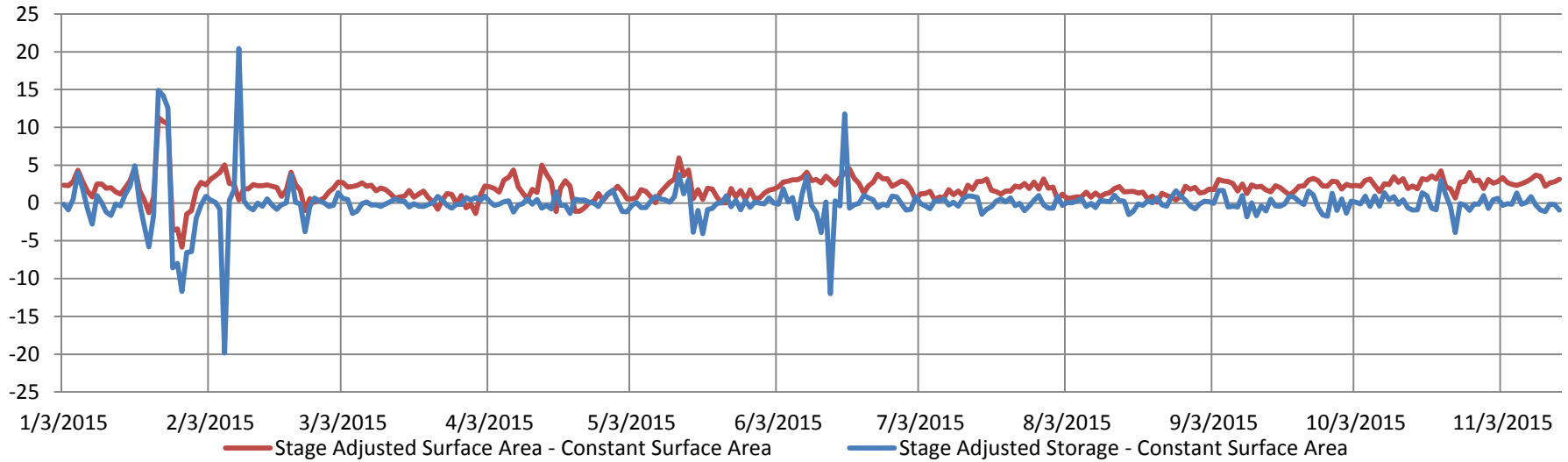
### CJ Strike Headwater



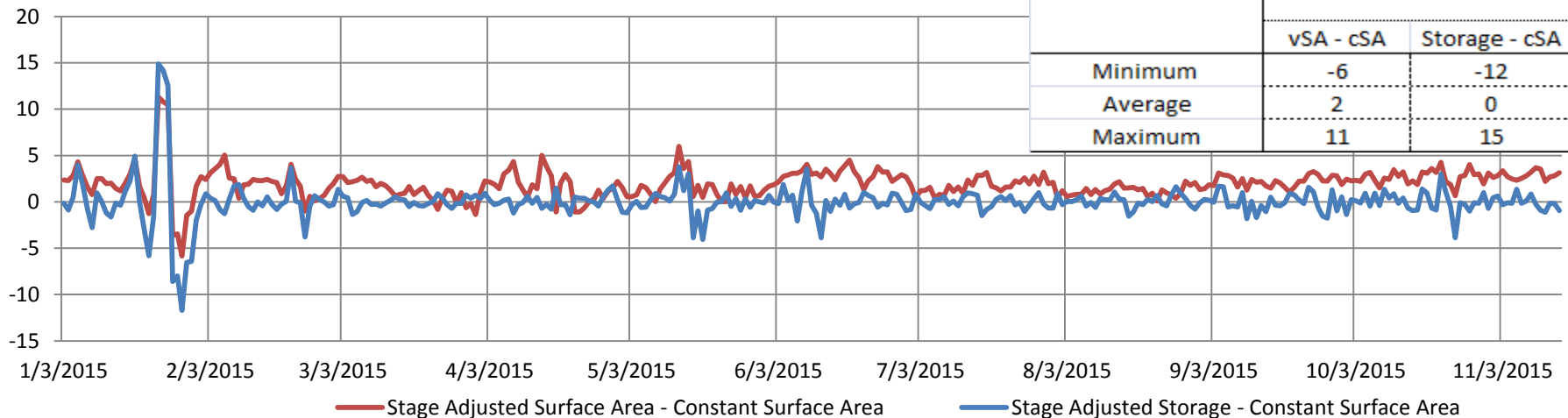
### Reservoir Adjustment Calculation Method Comparison



## Difference in AADF Calculation using Stage-Storage Relationships without extrapolation and Constant Surface Area



## Difference in AADF Calculation using Stage-Storage Relationships with extrapolation and Constant Surface Area



# Summary

- Recommend incorporating stage – storage relationship into AADF calculation
- The stage adjusted storage is most direct calculation
- Apply stage storage relationship with extrapolation to qualify stage measurements outside of LiDAR bounds
- Create notification in AADF calculation spreadsheet to alert in the event of stage outside of bounds