Monitoring Effects of Wildfire Mitigation Treatments on Water Budget Components: A Paired-Basin Study in the Santa Fe River Watershed, New Mexico

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GSA T104
From Pores to Mountains
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Acknowledgements

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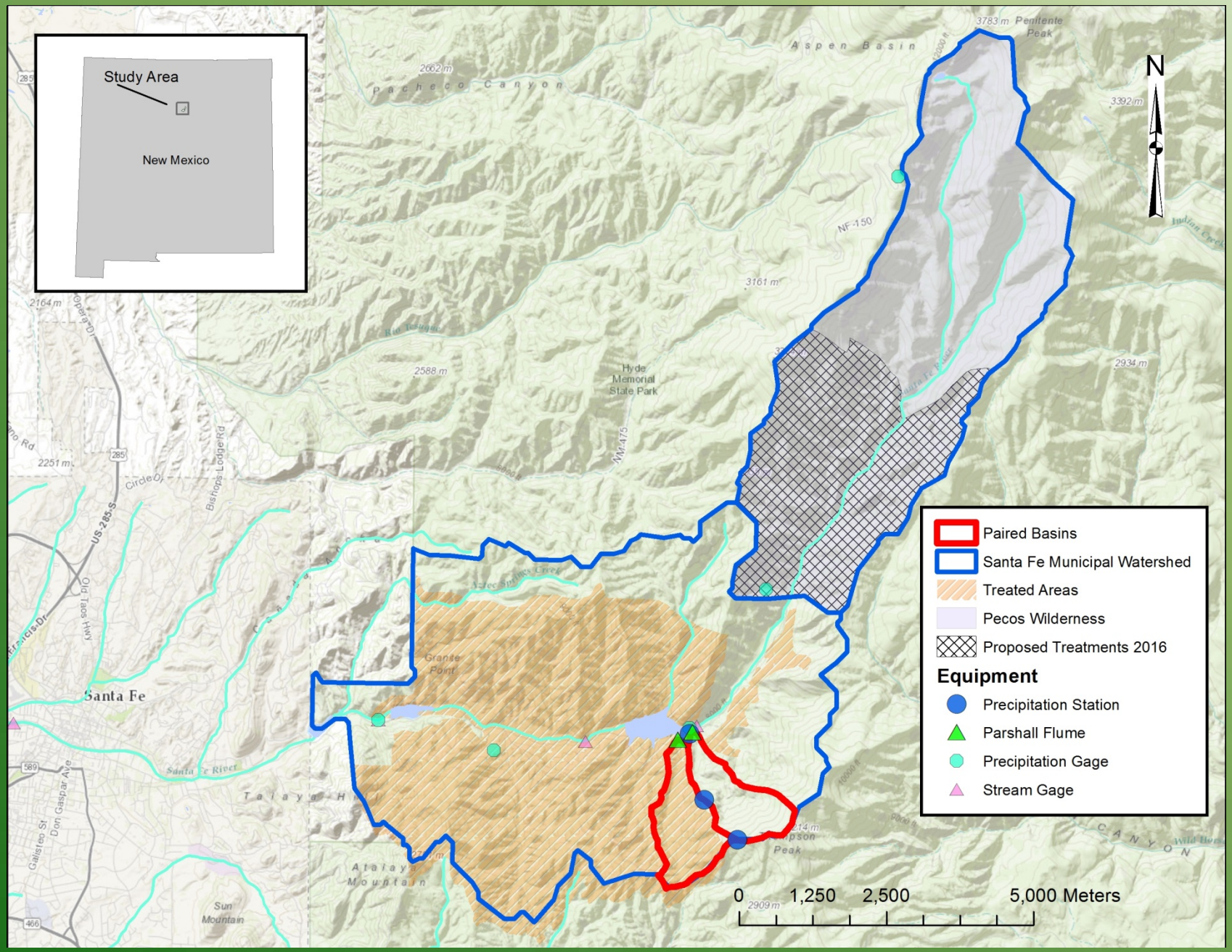
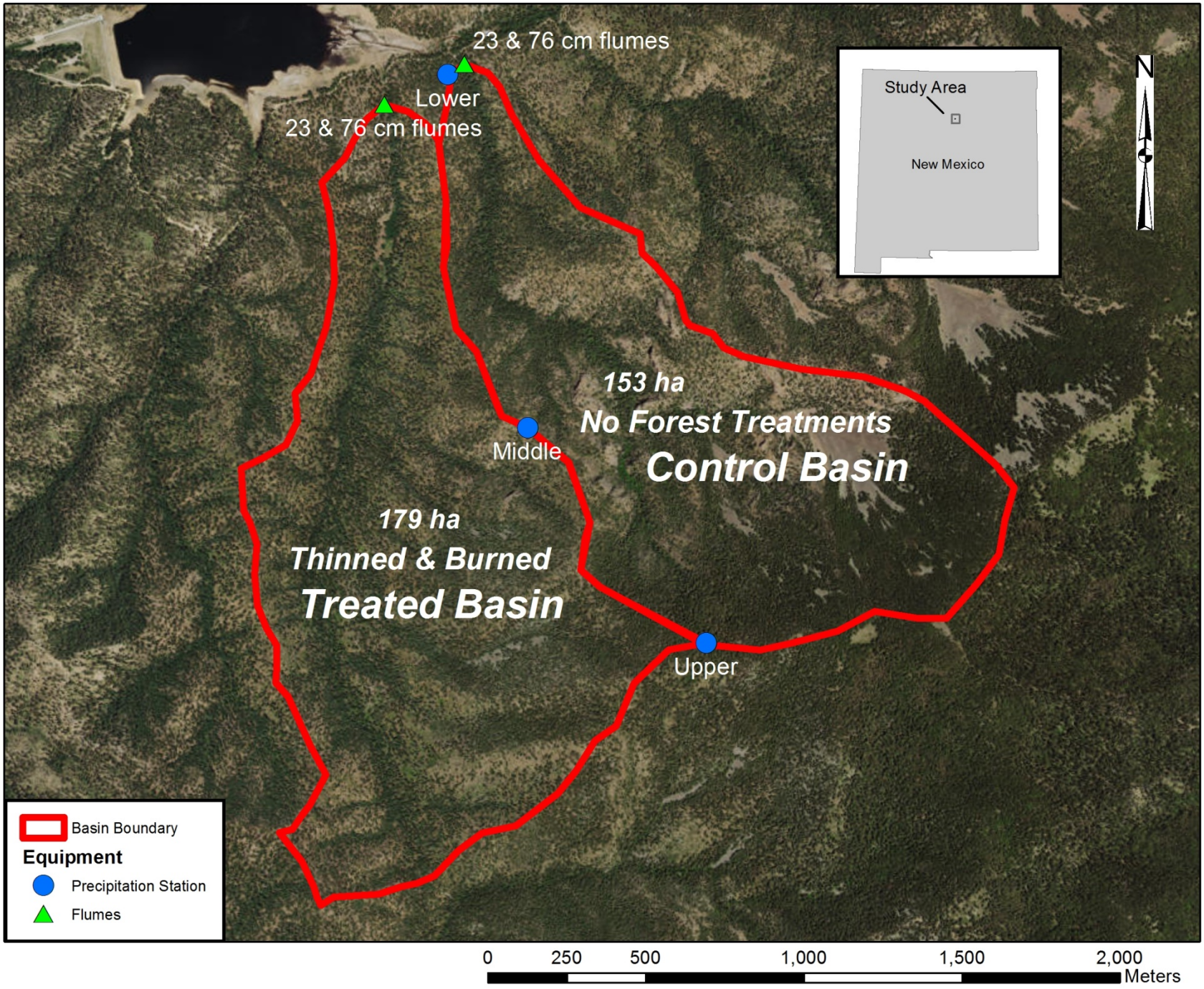
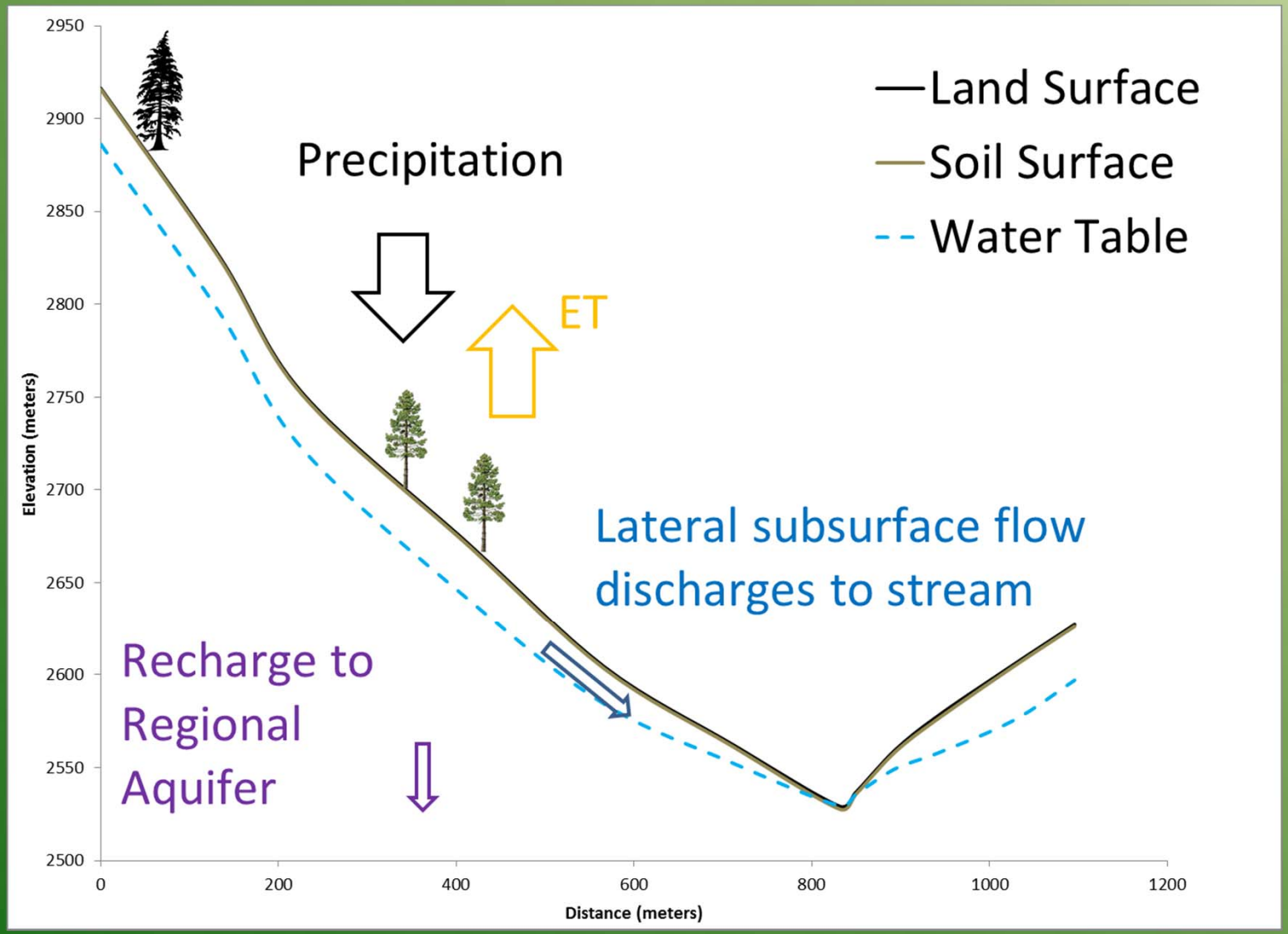

Study Area
New Mexico
N
Paired Basins
Santa Fe Municipal Watershed
Treated Areas
Pecos Wilderness
Proposed Treatments 2016
Equipment
Precipitation Station
Parshall Flume
Precipitation Gage
Stream Gage
0
1,250
2,500
5,000 Meters
Aspen Basin
Pacheco Canyon
Penitente Peak
Hyde Memorial State Park
Granite Point
Santa Fe
Talaya Hill
Atalaya Mountain
Sun Mountain
Santa Fe River
NF-150
NM-475
US-285-S
Old Taos Hwy
Bishops Lodge Rd
Galisteo St
Don Gaspar Ave


23 & 76 cm flumes
Lower
23 & 76 cm flumes
Study Area
New Mexico
N
153 ha
No Forest Treatments
Control Basin
Middle
179 ha
Thinned & Burned
Treated Basin
Upper
Basin Boundary
Equipment
Precipitation Station
Flumes
0
250
500
1,000
1,500
2,000
Meters

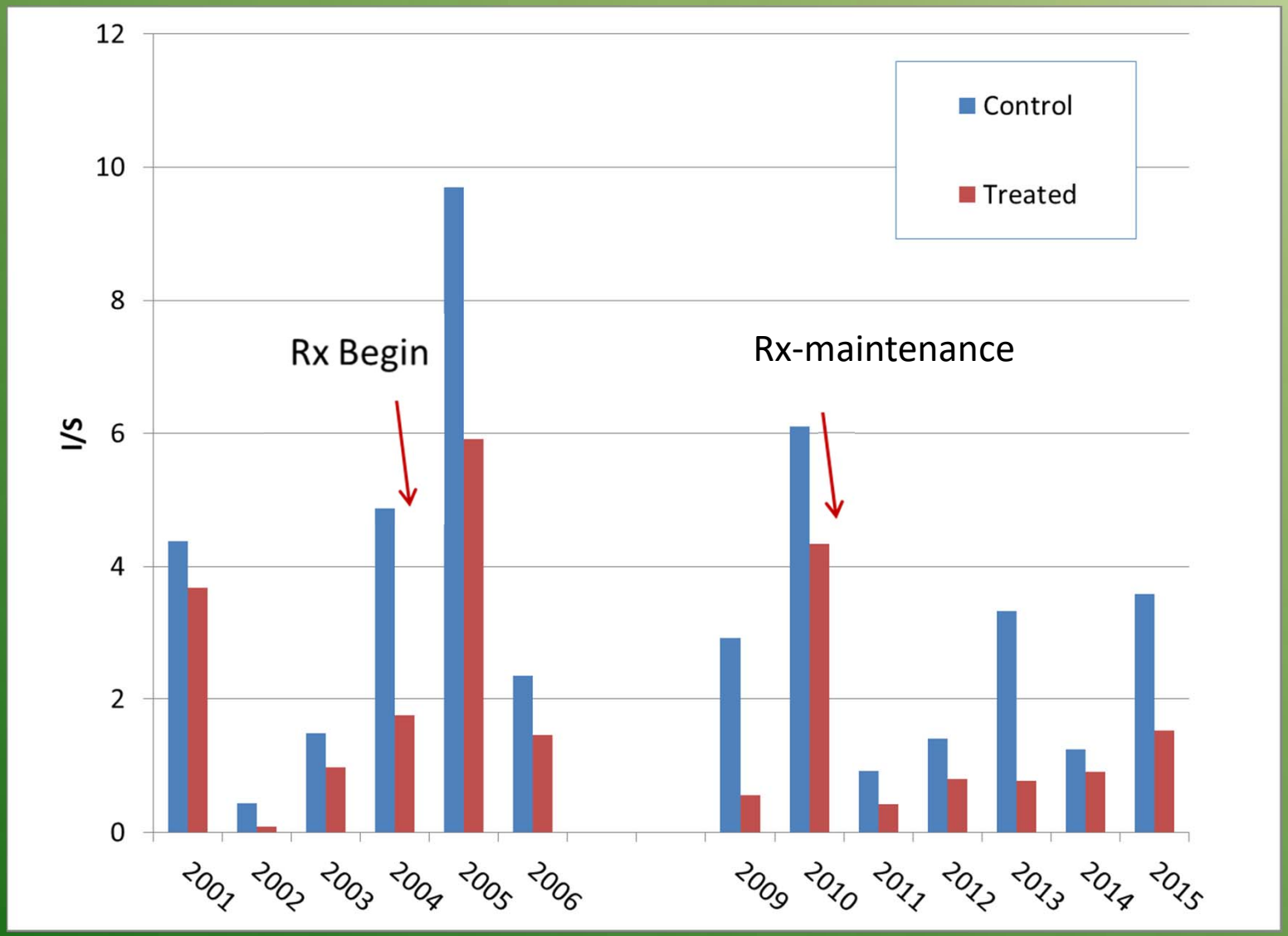
Specific Questions

- *Will the total surface runoff volume change following thinning?*
- *Will the total amount of groundwater recharge change following thinning?*
- *Will the rate and timing of surface runoff change?*

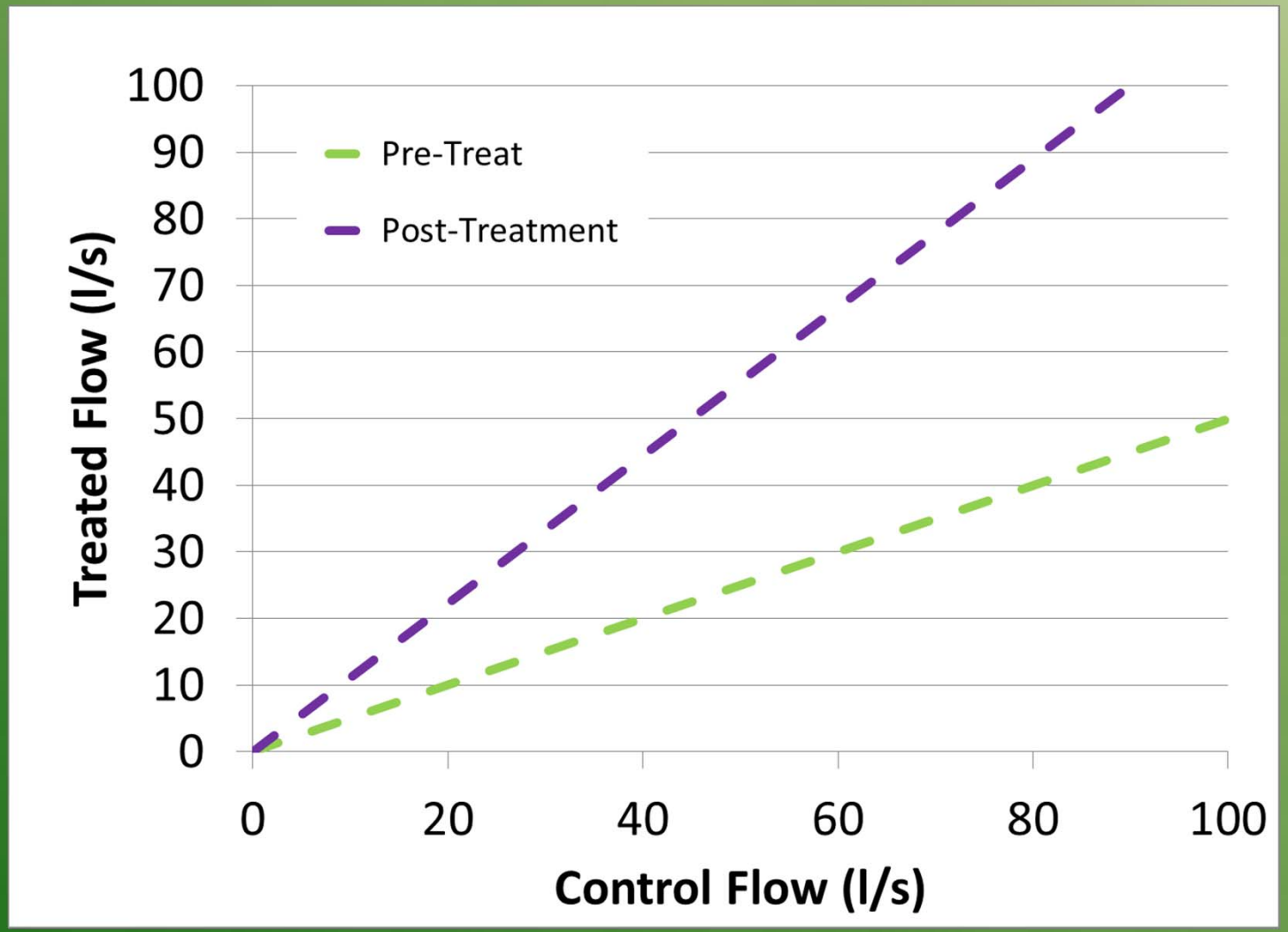
Cross-Section of Treated Basin



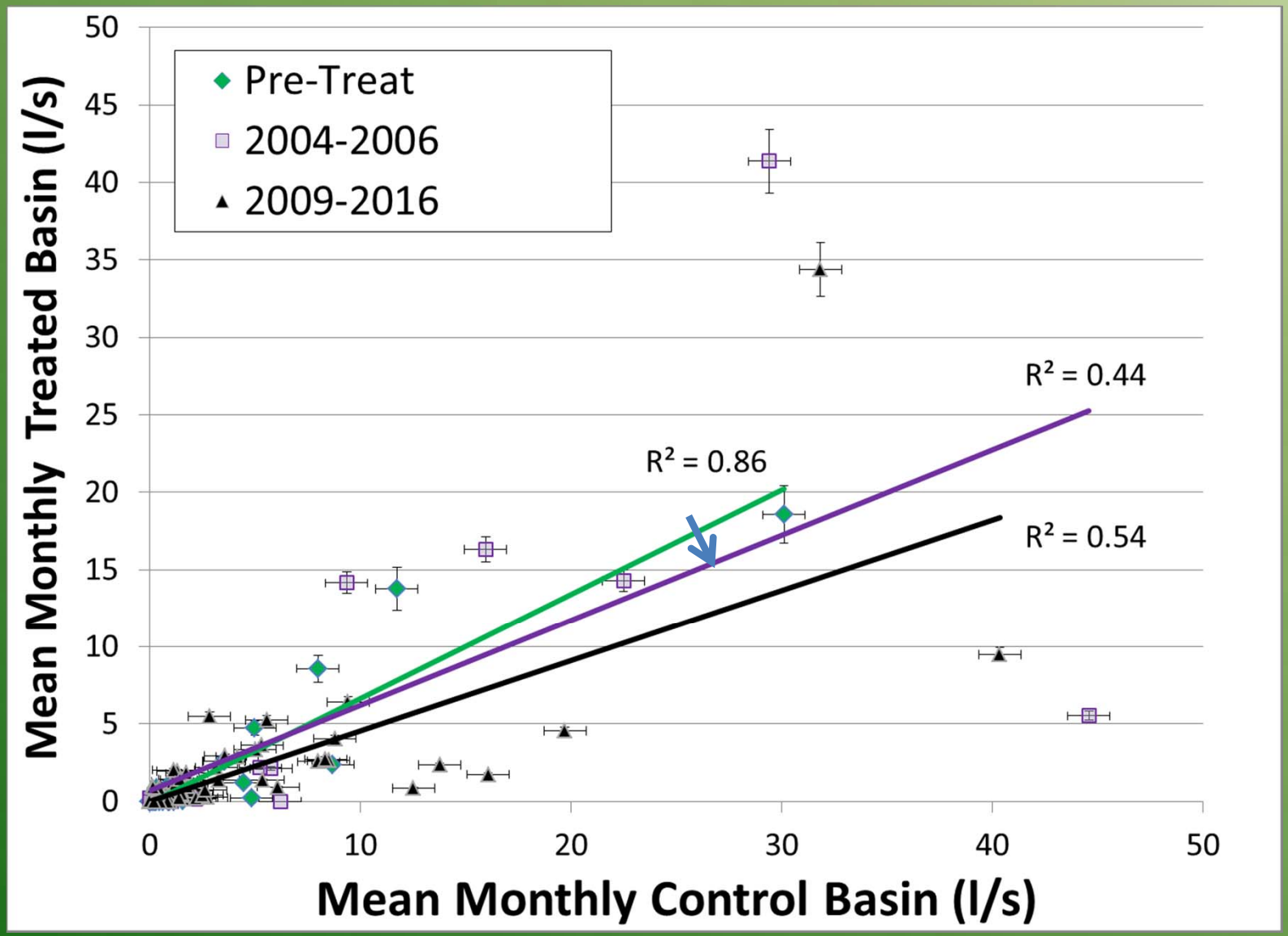
Average Flow by Water Year



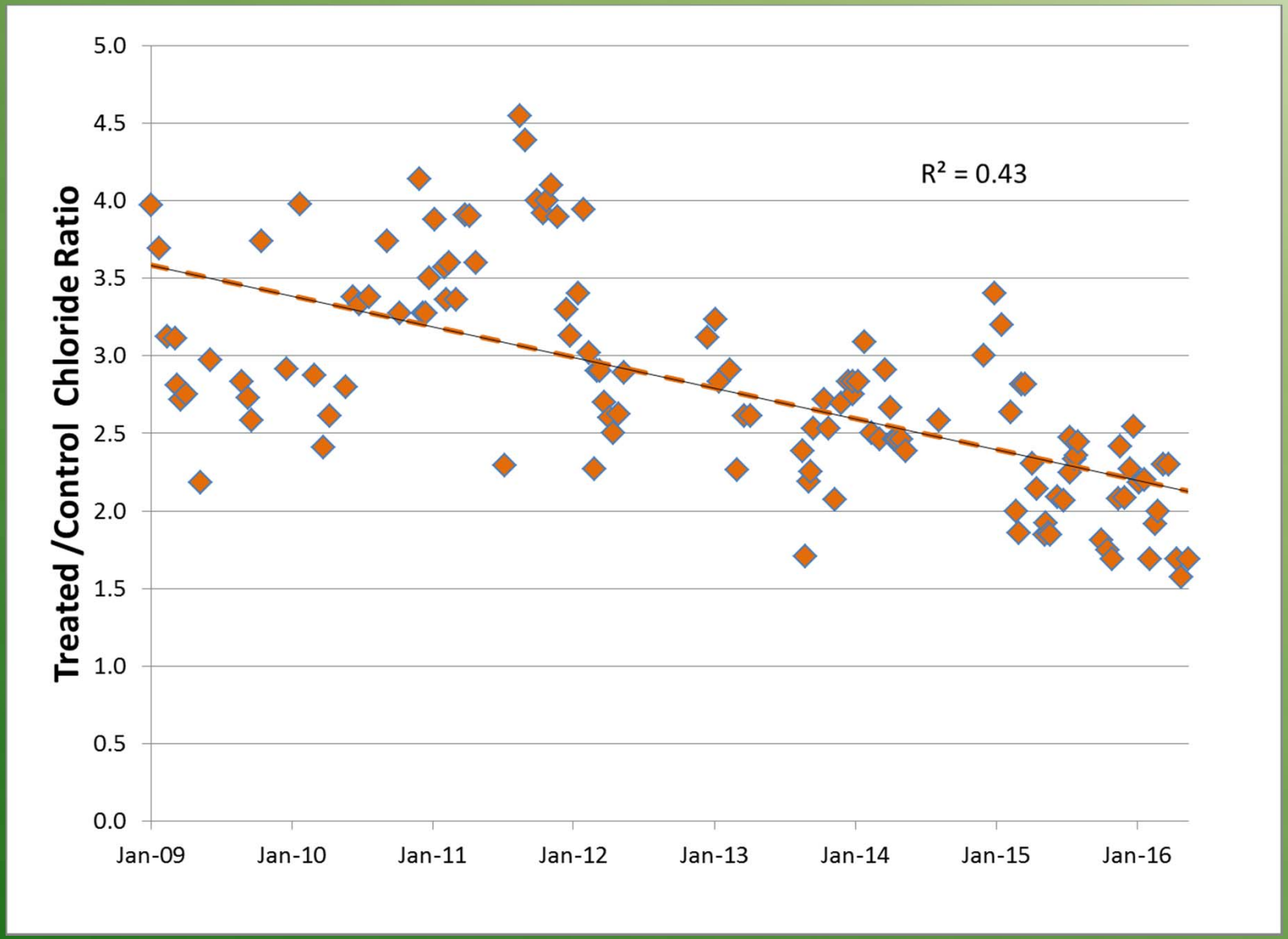
Conceptual Pre- and Post-Treatment



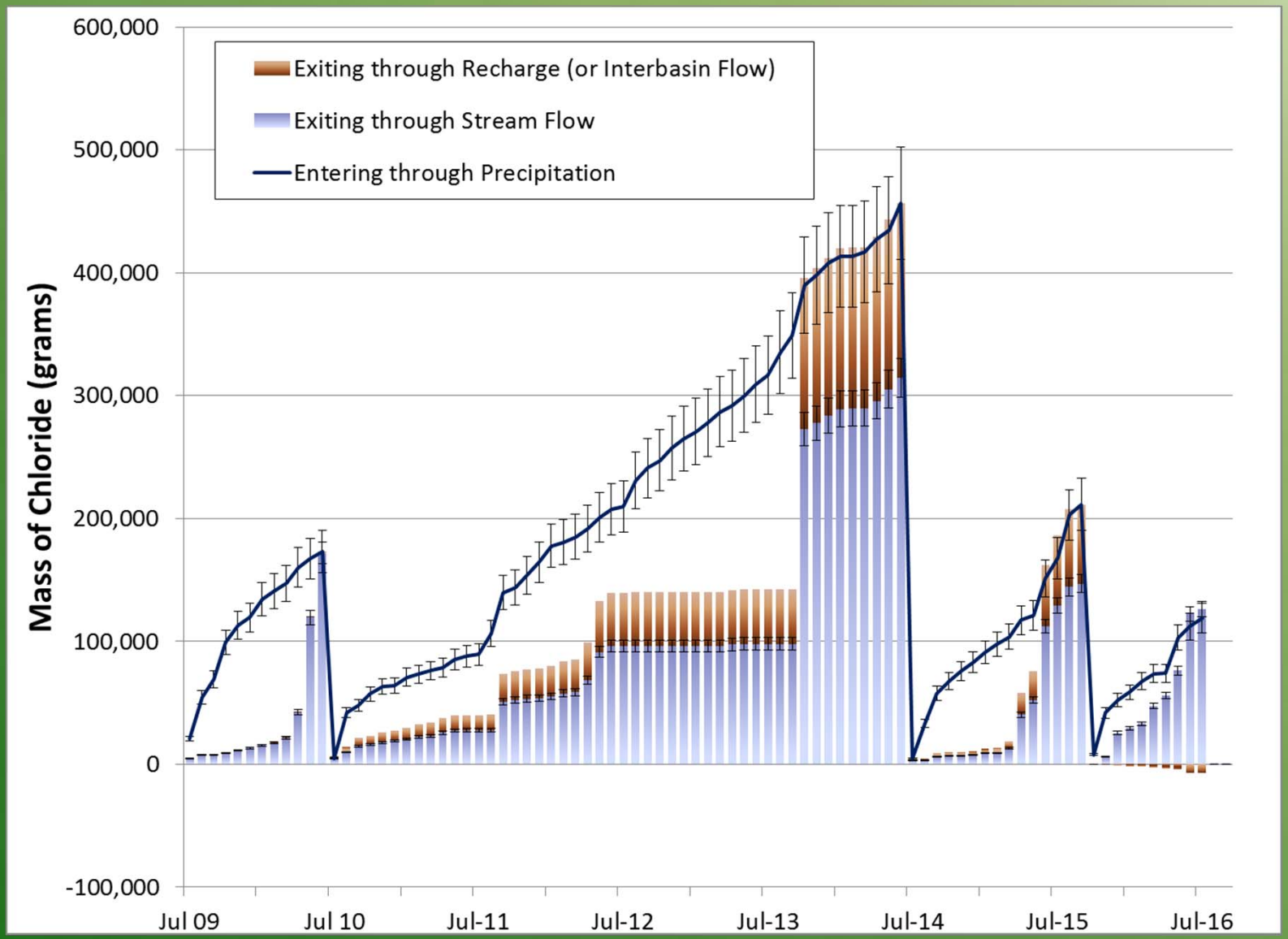
Mean Monthly Flow: Before and After



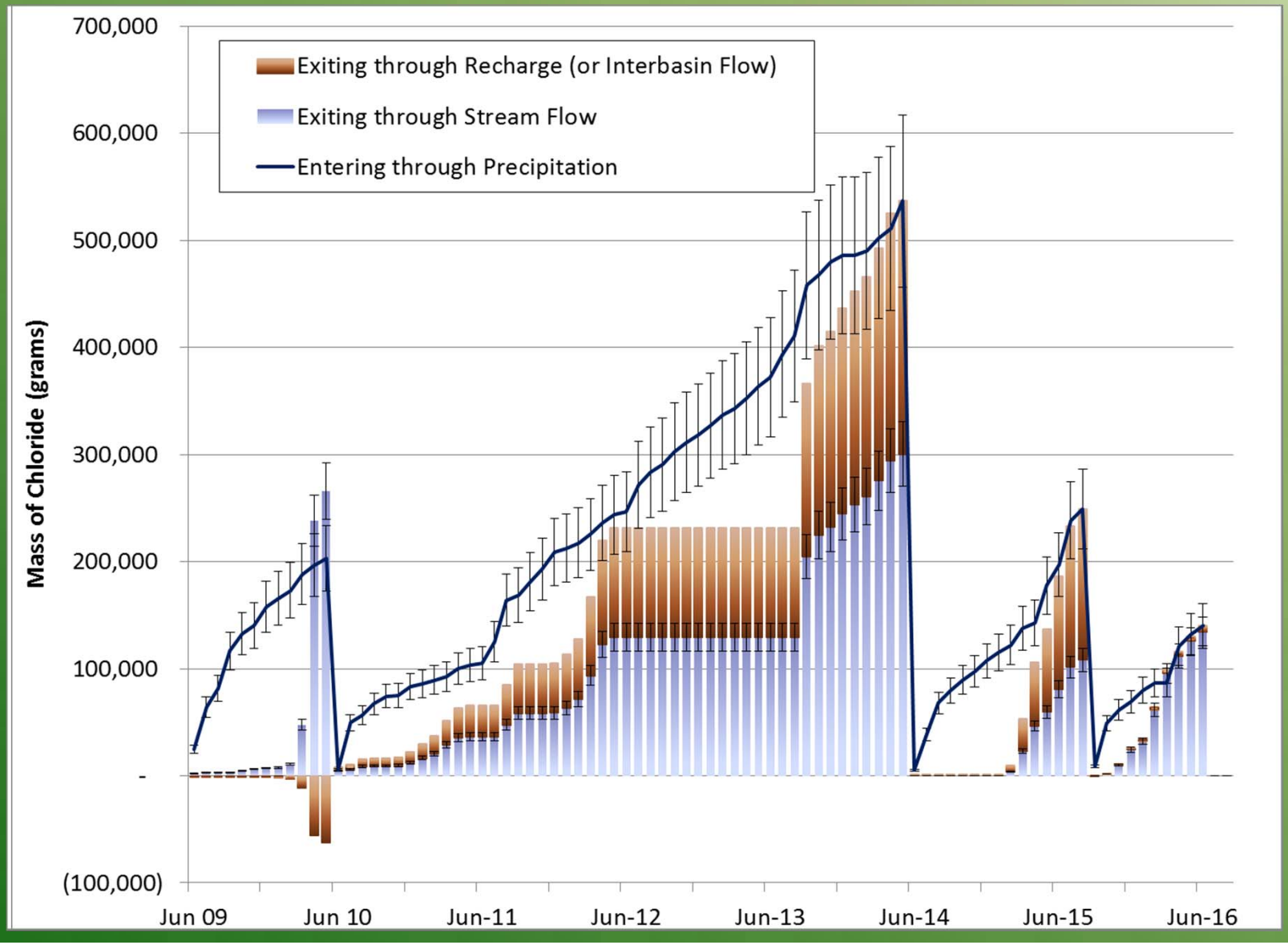
Chloride Ratio: Treated Stream/Control Stream



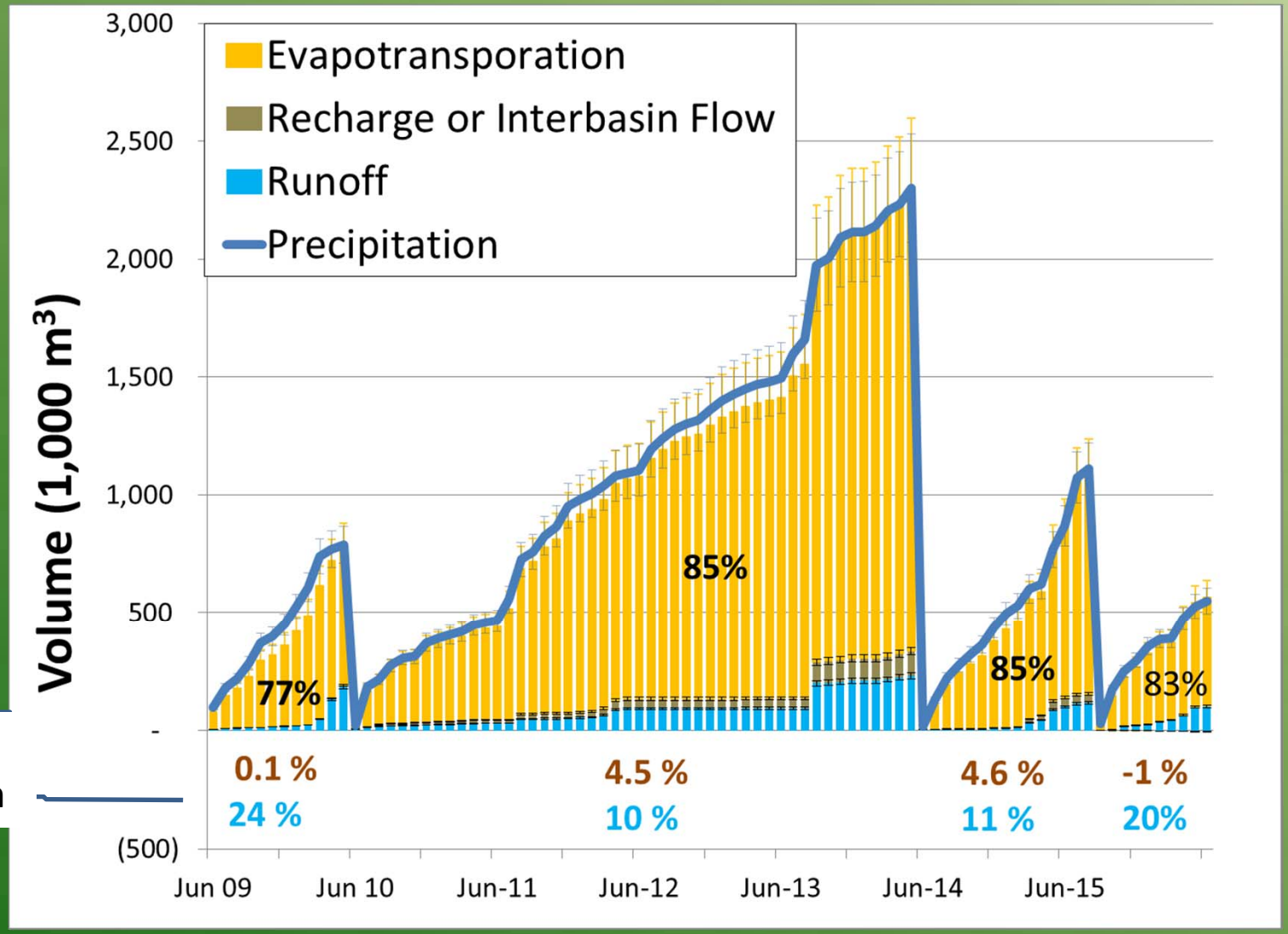
Integration Periods-Control Basin



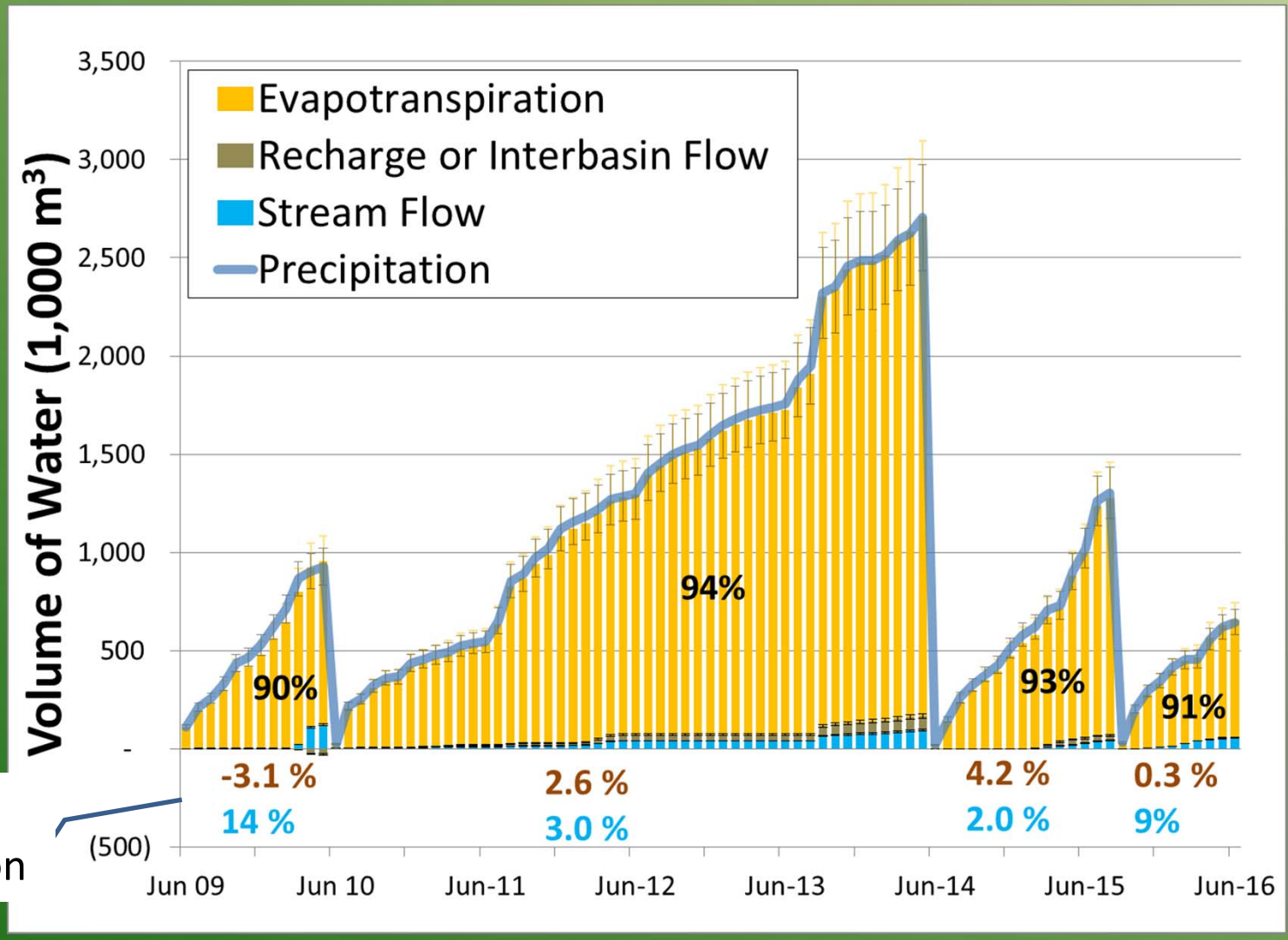
Integration Periods –Treated Basin



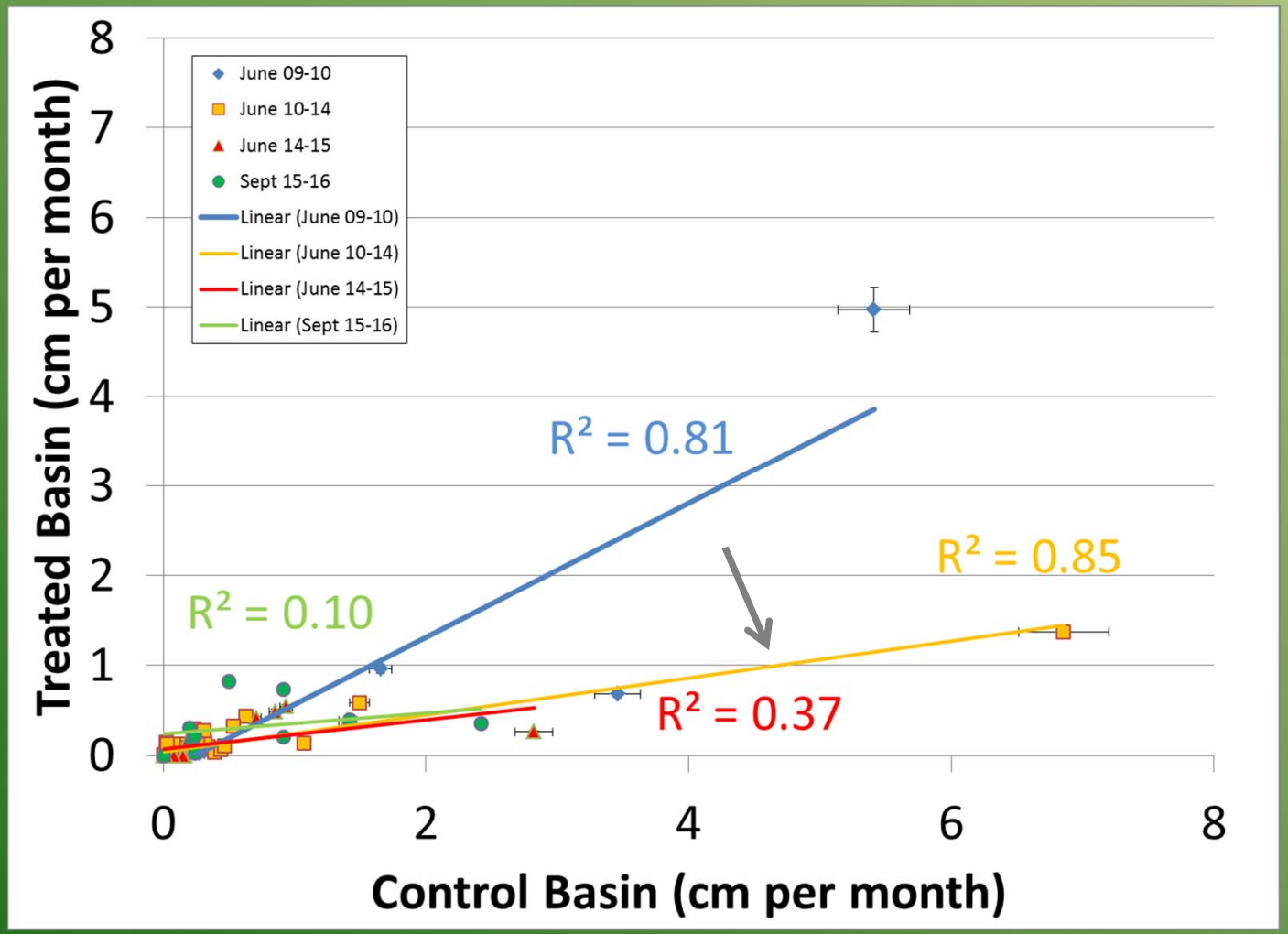
Cumulative Water Budget Control Basin



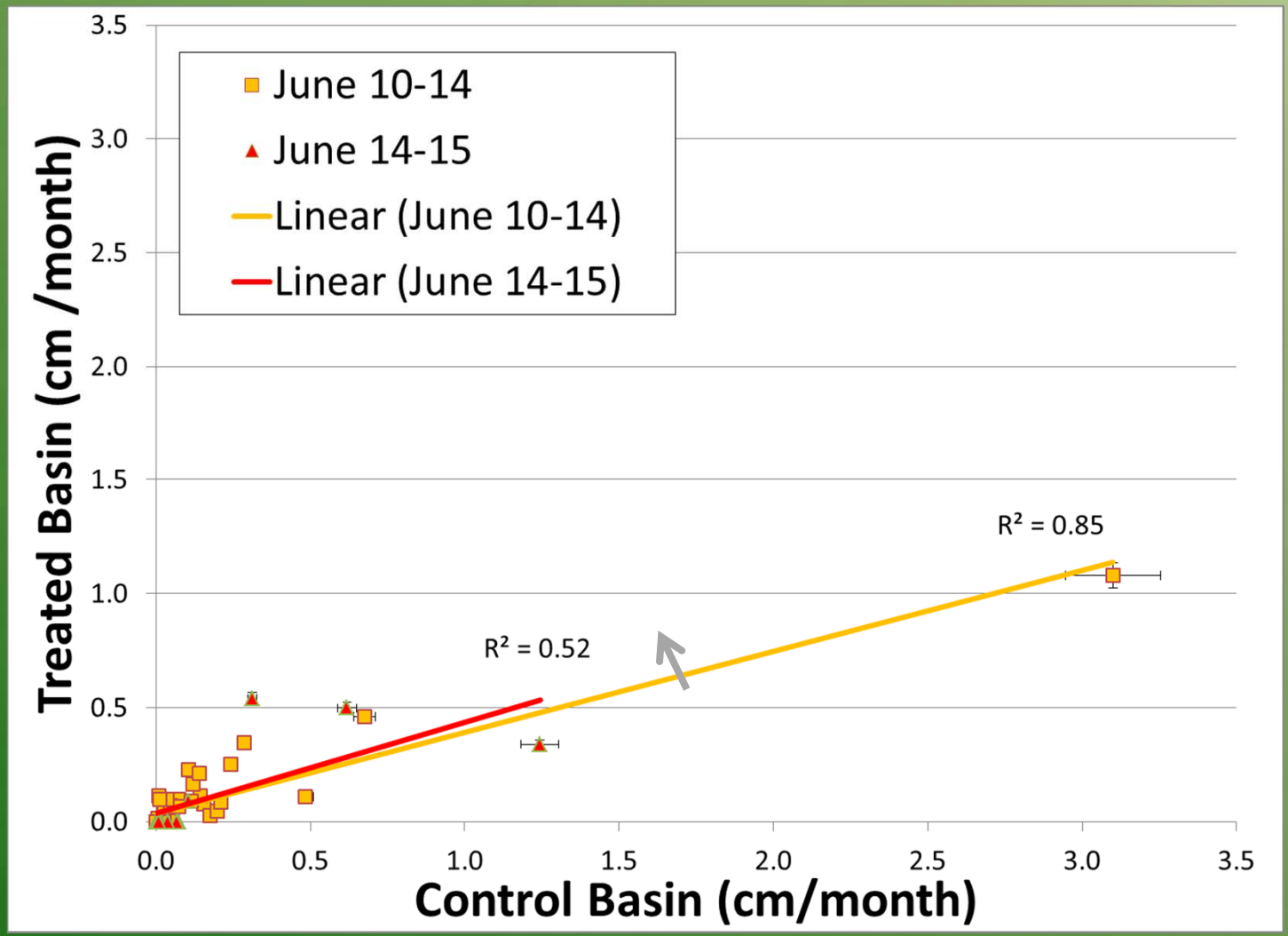
Cumulative Water Budgets
Treated Basin



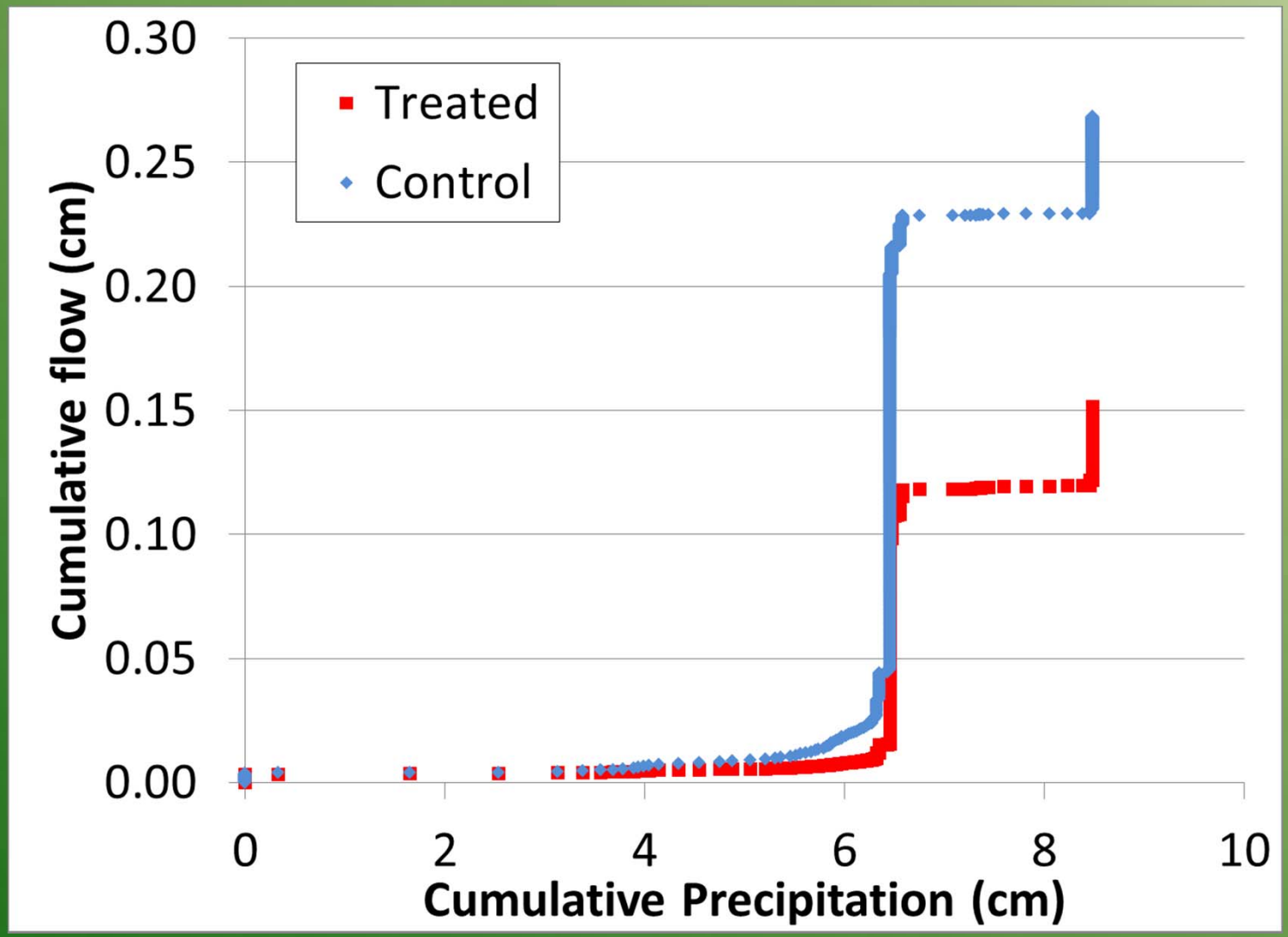
Decreasing Runoff in Treated Basin as Compared to Control Basin



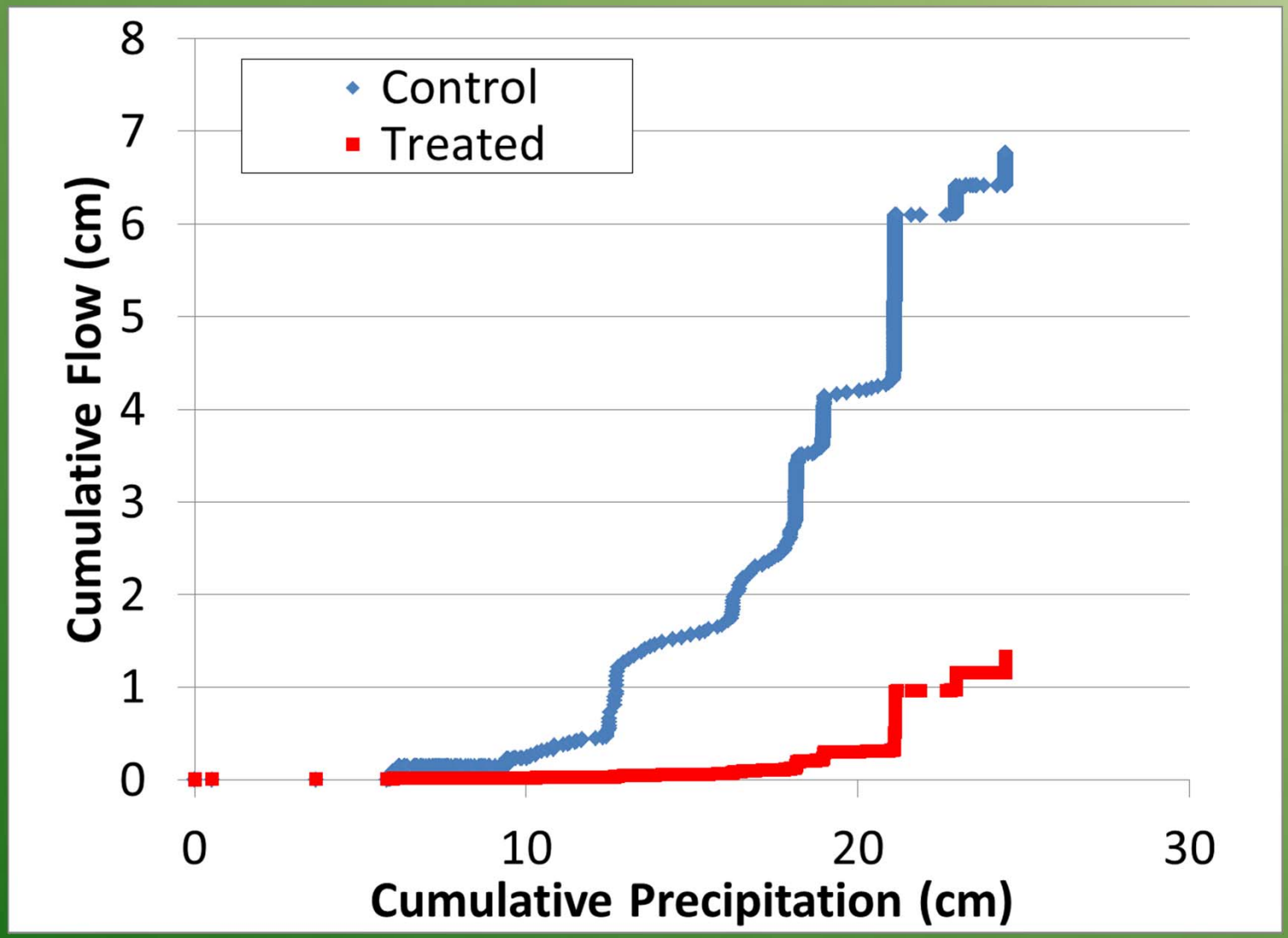
Increasing Recharge in Treated Basin as compared to Control Basin



June 2003 Storm Response



September 2013 Storm Response



Conclusions

Parameter	Treated vs Control	Basis
ET	Decreasing	Chloride ratio appears to be declining
Runoff	Decreasing?	Flow in treated basin is progressively less with each of the dry integration periods, but a series of wet years are needed to confirm
Recharge	No change-Increasing?	Cross plot of T v C monthly recharge slightly higher
Storm Runoff	Intensity Decreasing	Based on storm response pre and post-treatment