

Historical Trends in Delta Outflow and Fall X2

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On behalf of Contra Costa County, Contra Costa
County Water Agency, and Solano County

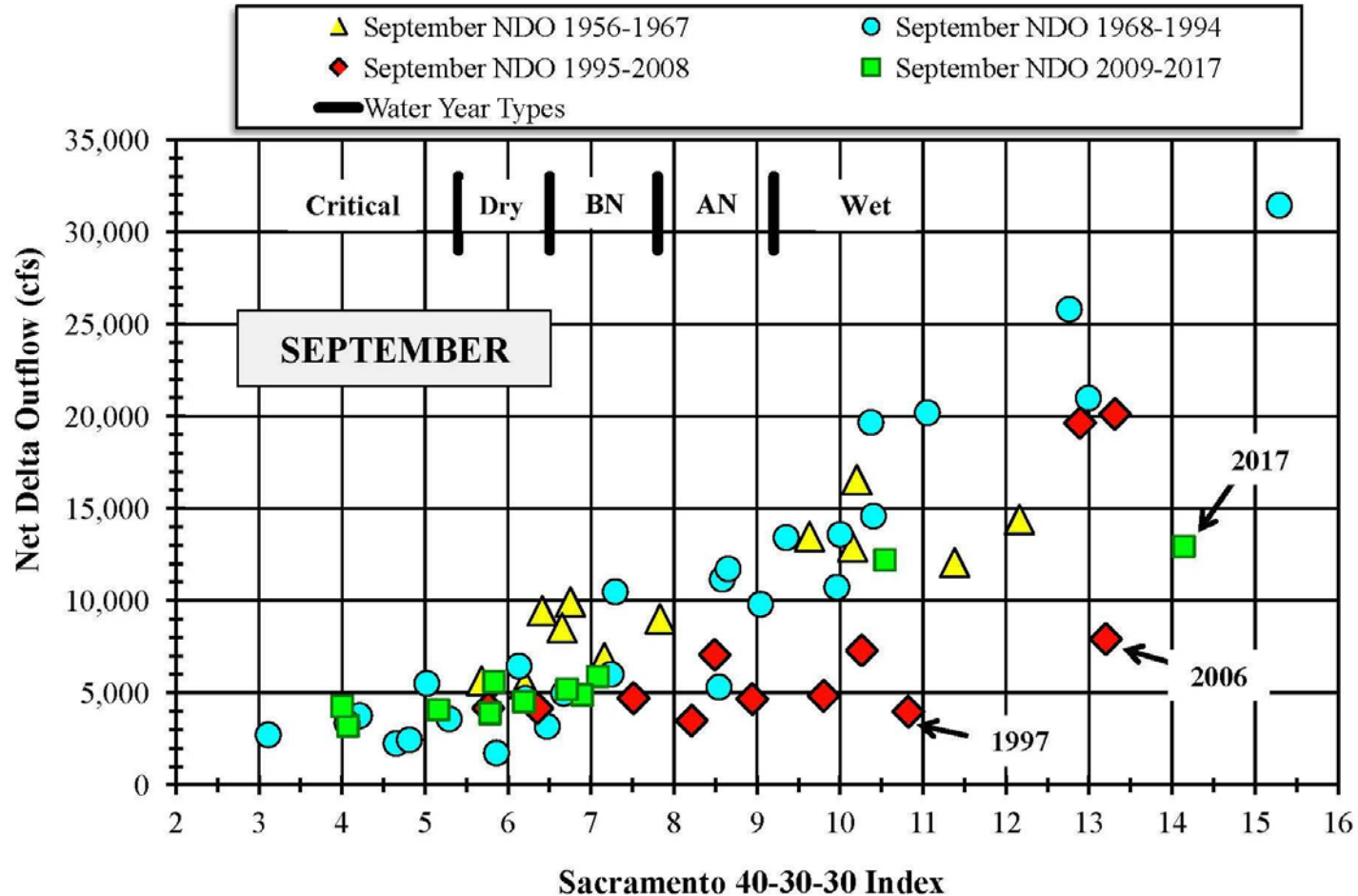
*Part 2 Sur-Rebuttal
CWF Hearing before SWRCB
Sacramento, 2018*

Dr. Hutton's analysis of historical trends in Delta outflow and Fall X2 masks actual trends

- Dr. Hutton criticized findings in 2010 Delta Flow Criteria Report and Phase II Scientific Basis Report
- Dr. Hutton opined (DWR-1224-revised, page 4):
 - ❖ No statistically significant long-term trend in Delta outflow
 - ❖ No long-term increasing trend in Fall X2
- Dr. Hutton's analysis of time series without taking into account variations in water year runoff masks recent trends in Fall outflow and Fall X2
- An analysis of historical data as a function of Sacramento 40-30-30 water year index is presented

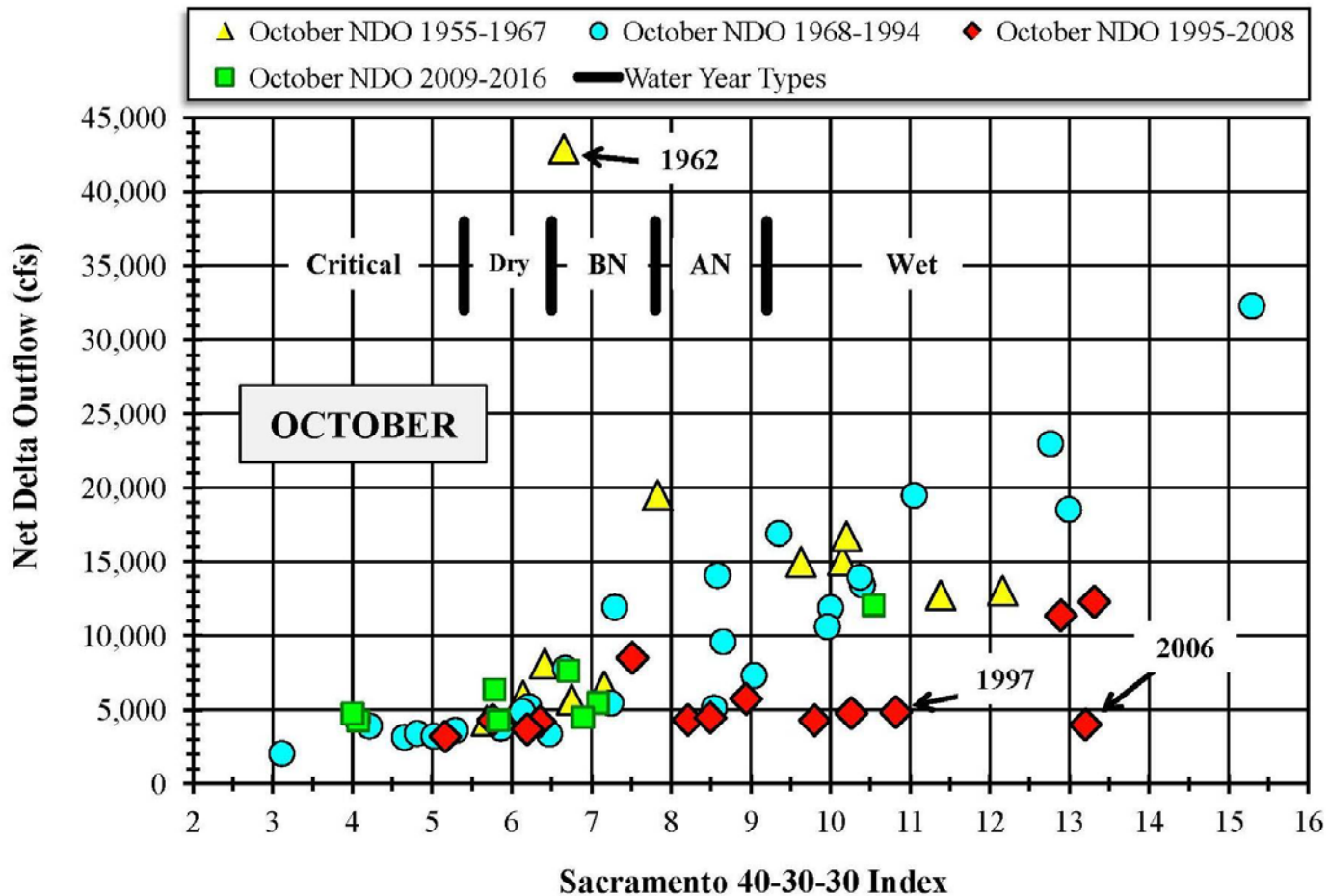
Historical September Delta outflow reduced dramatically after implementation of Spring X2 in 1995

September Delta Outflow

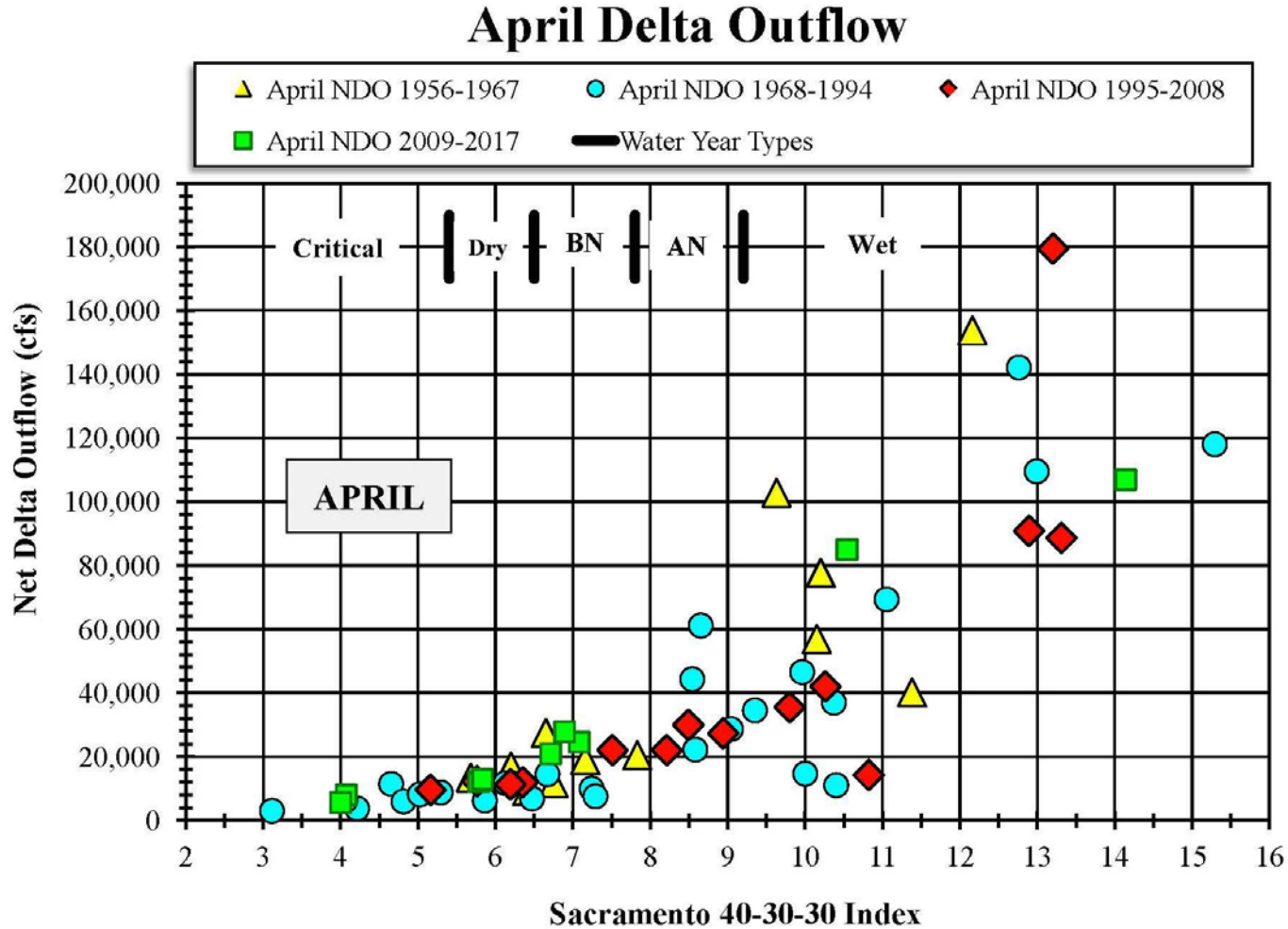


October Delta outflow also reduced dramatically after implementation of Spring X2 in 1995

October Delta Outflow

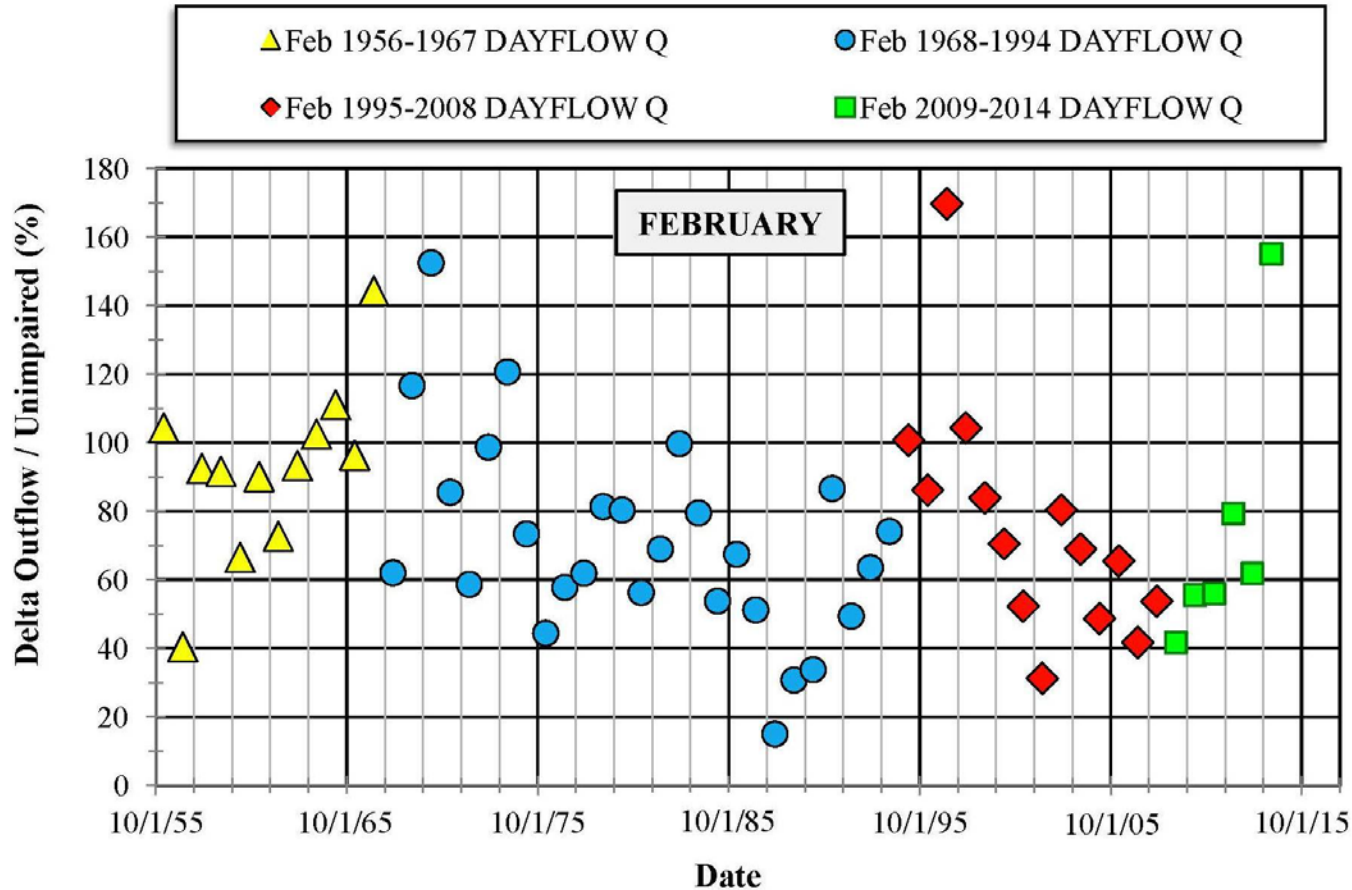


No obvious change in Delta outflow in Spring after implementation of Spring X2 in 1995

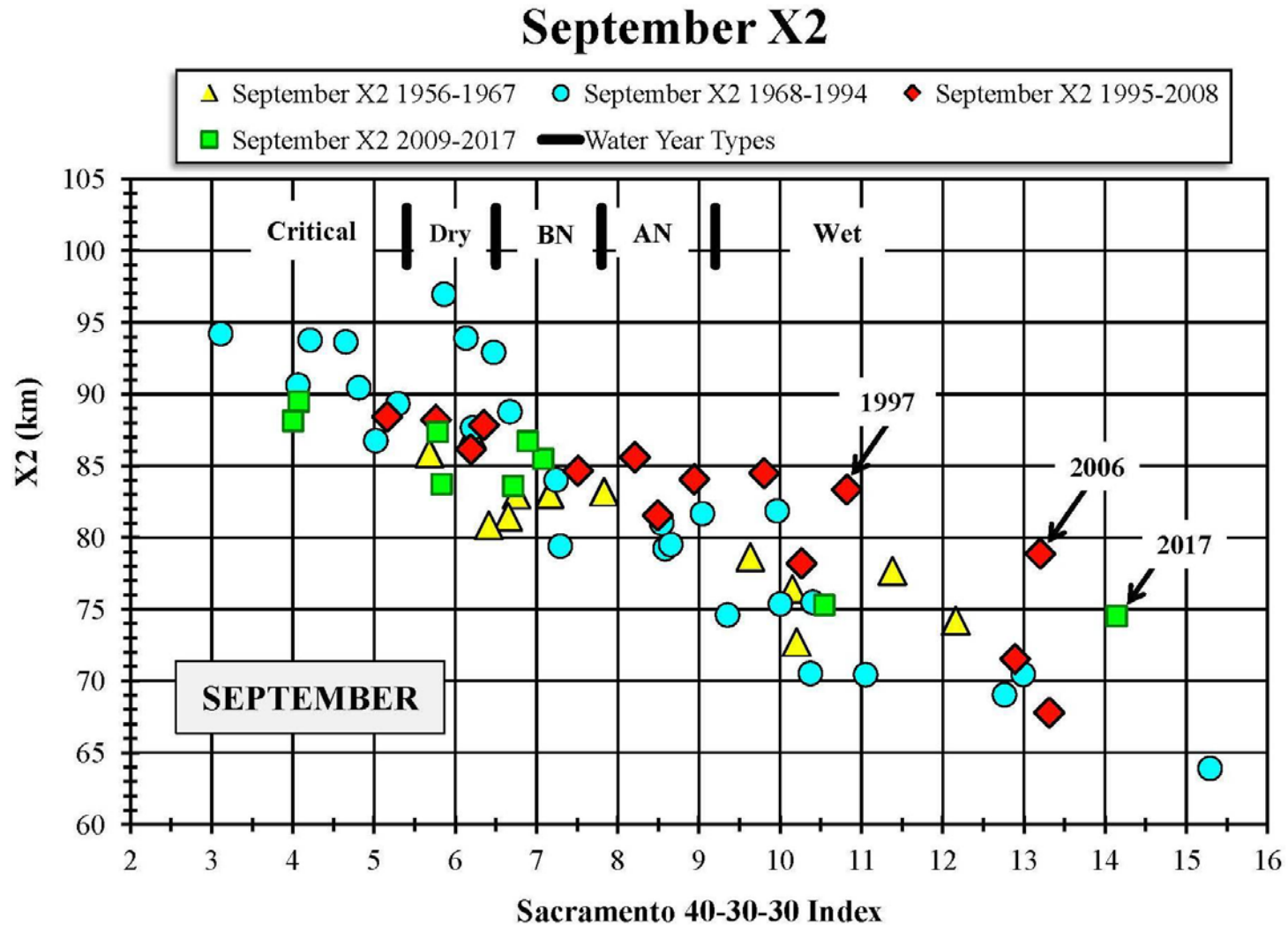


February Delta outflow as a percentage of unimpaired outflow decreases during 1968-1994

Percentage of Unimpaired Delta Outflow

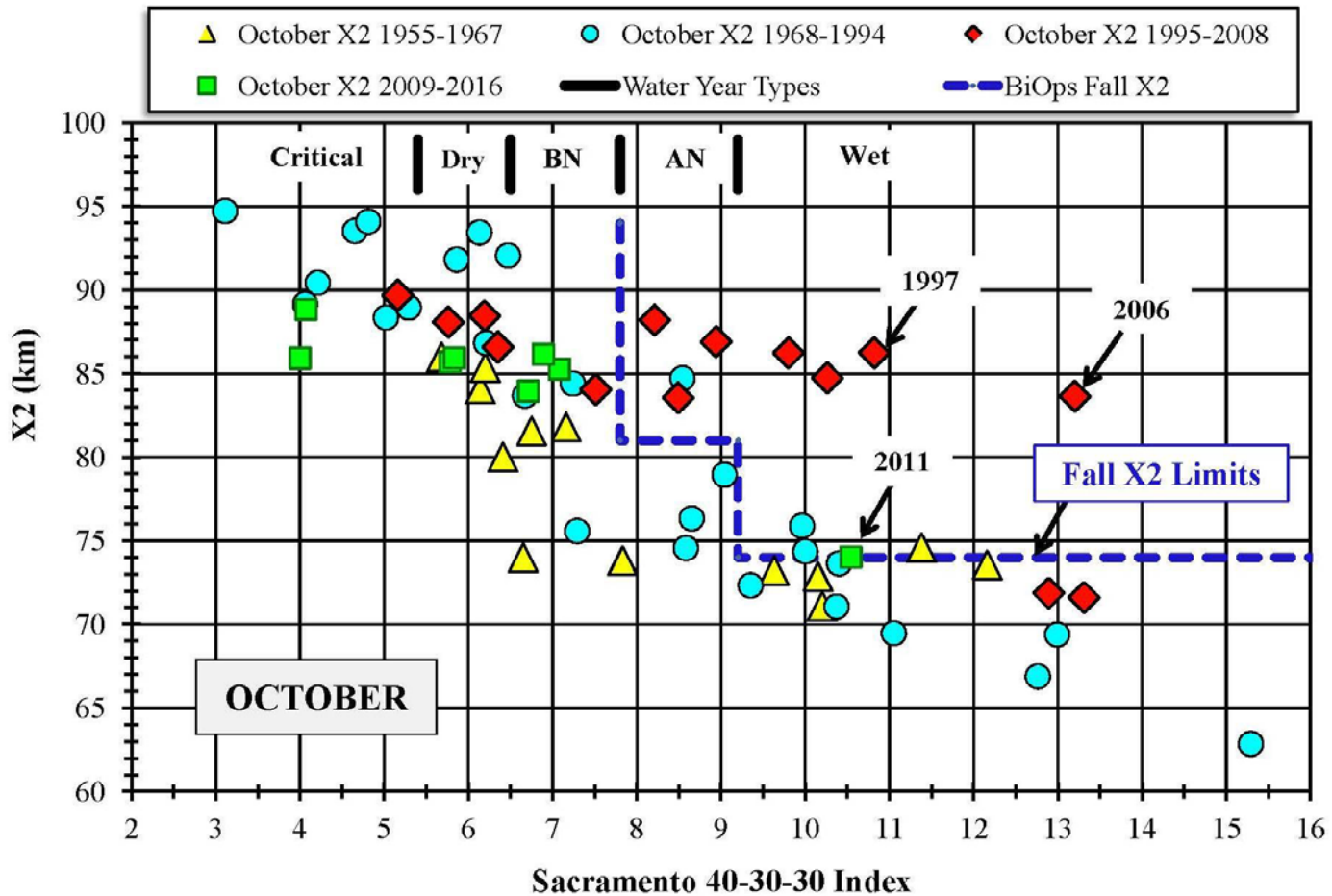


September X2 increased after 1995



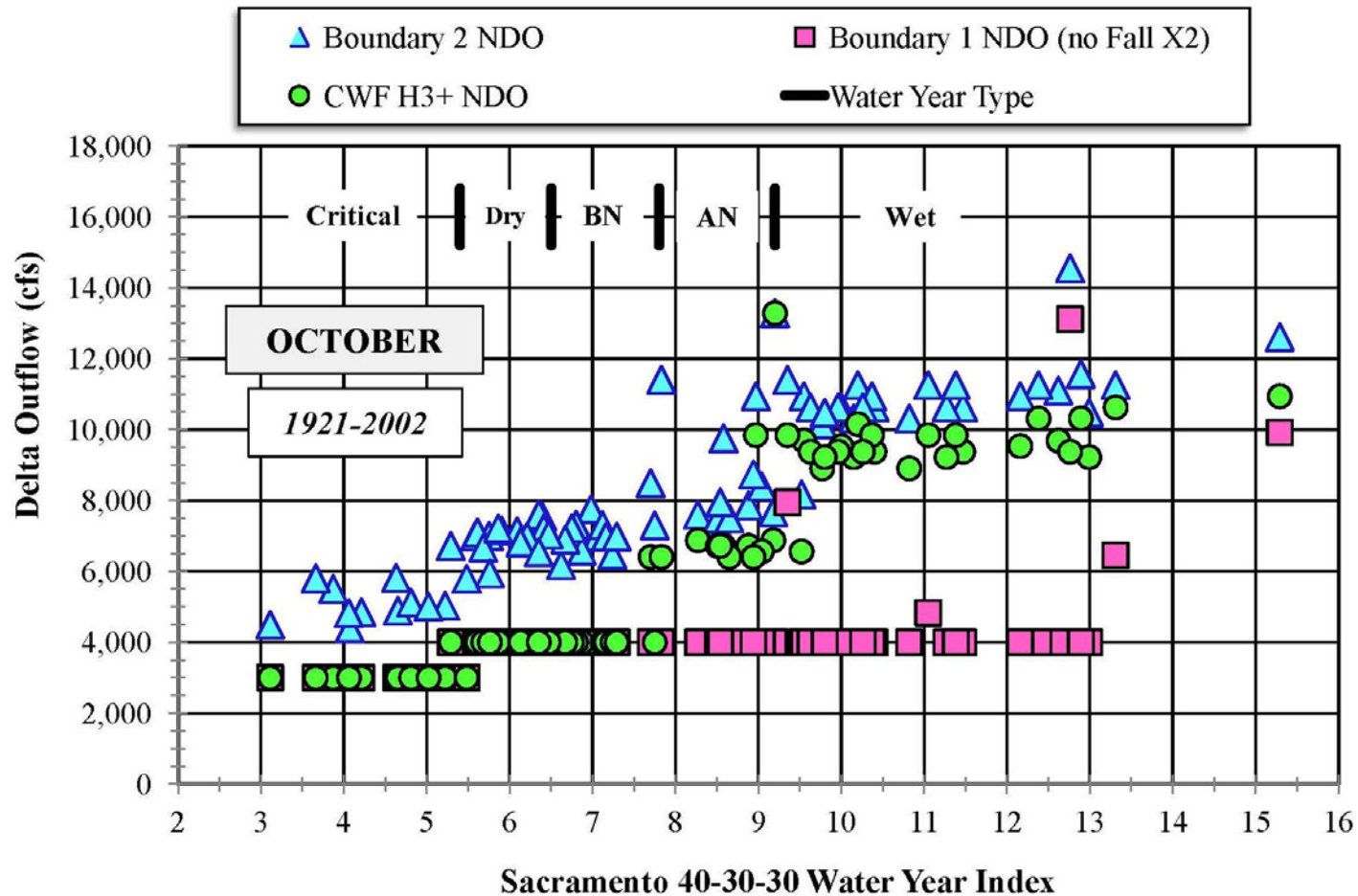
Increase in Fall X2 after 1995 even more obvious in October. Fall X2 limits will correct this.

October X2



CWF Modeling with and without Fall X2 show similar trends in Delta outflow during the Fall

October Delta Outflow



Conclusions

1. Plots of Delta outflow as a function of water year index show trend over time in the fall.
2. Fall Delta outflows reduced substantially after implementation of Spring X2 (Feb-June) objective in 1995.
3. Unintended consequence of restoring Delta ecosystem in spring but not protecting flows or X2 in summer and fall.
4. Plots of X2 as a function of water year index show Fall X2 increased during the 14-year period (1995-2008.)
5. Only two wet years and no above normal years since 2008 so Fall X2 limits not tested.
6. Fall X2 limits will avoid repeat of 1995-2008 and improve Delta water quality.