

# CALIFORNIA WATER FIX

South Delta Water Agency Parties  
Case-In-Chief Part 1b

TESTIMONY OF TOM BURKE, M.S. P.E.

# Central and South Delta Issues

- ▣ The Central and Southern Delta
  - An Existing Stressed System
  - Existing Stressors
    - ▣ Water Quality
    - ▣ Temperature
    - ▣ Stage
    - ▣ Algal Blooms

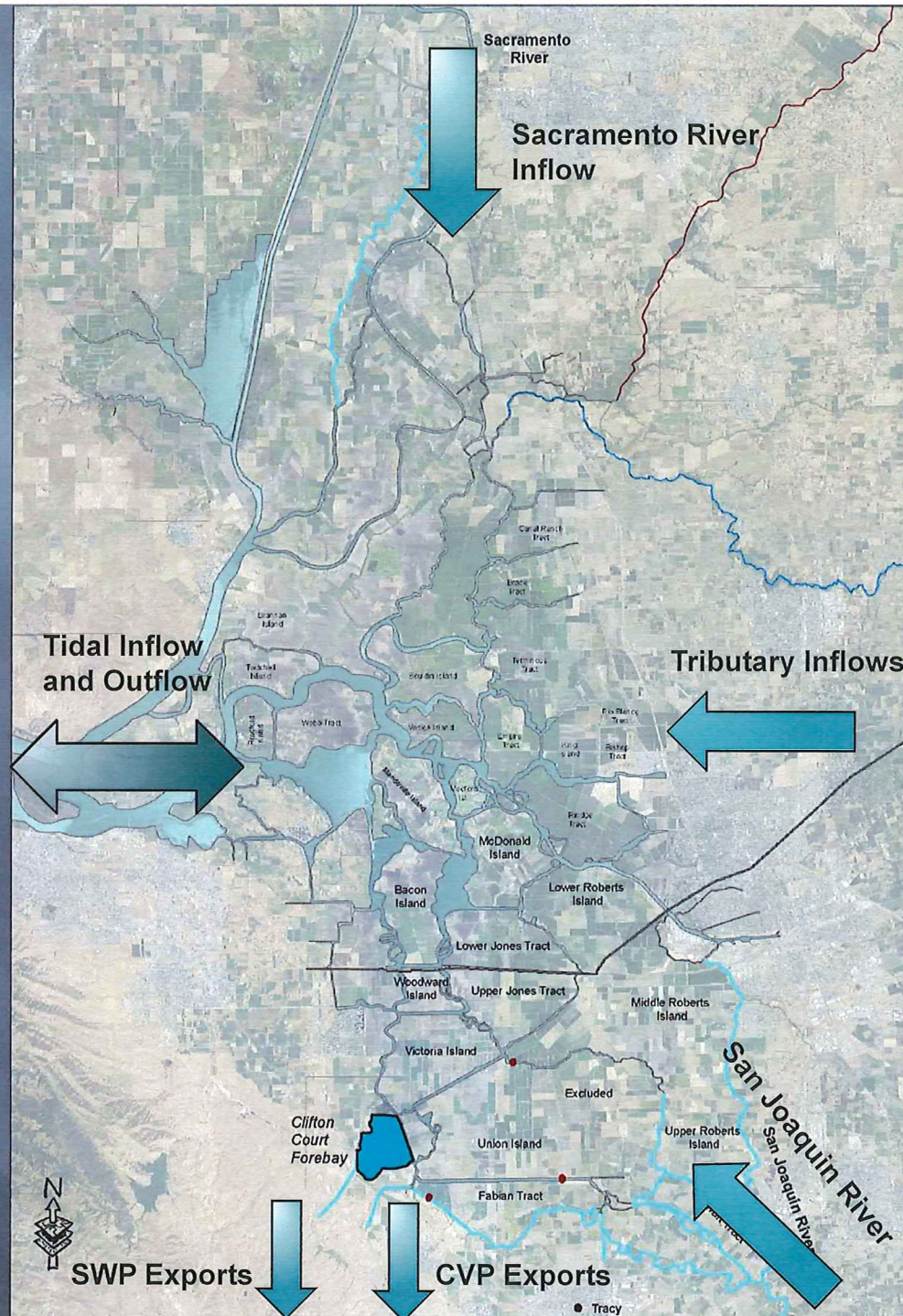
# Analysis

- ▣ Evaluated the Impact of the CWF on the hydrodynamics and water quality in the Central and South Delta
  - Effect on Salinity
  - Effect on River Stage
  - Effect on Residence Time

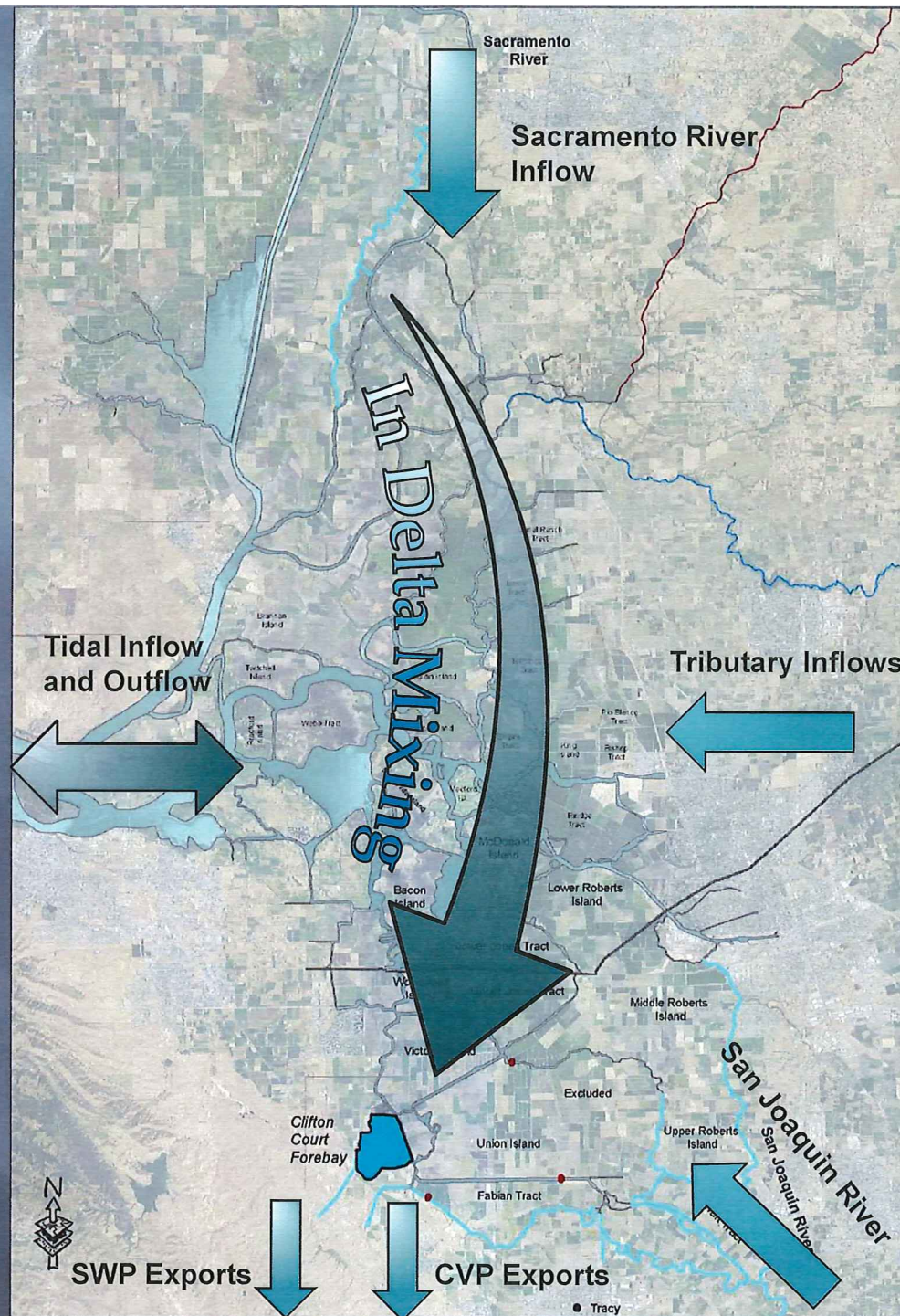
# CWF System Components

- ▣ Diversions
- ▣ Tunnels
- ▣ 4 Scenarios
  - B1
  - H3
  - H4
  - B2
  - NAA

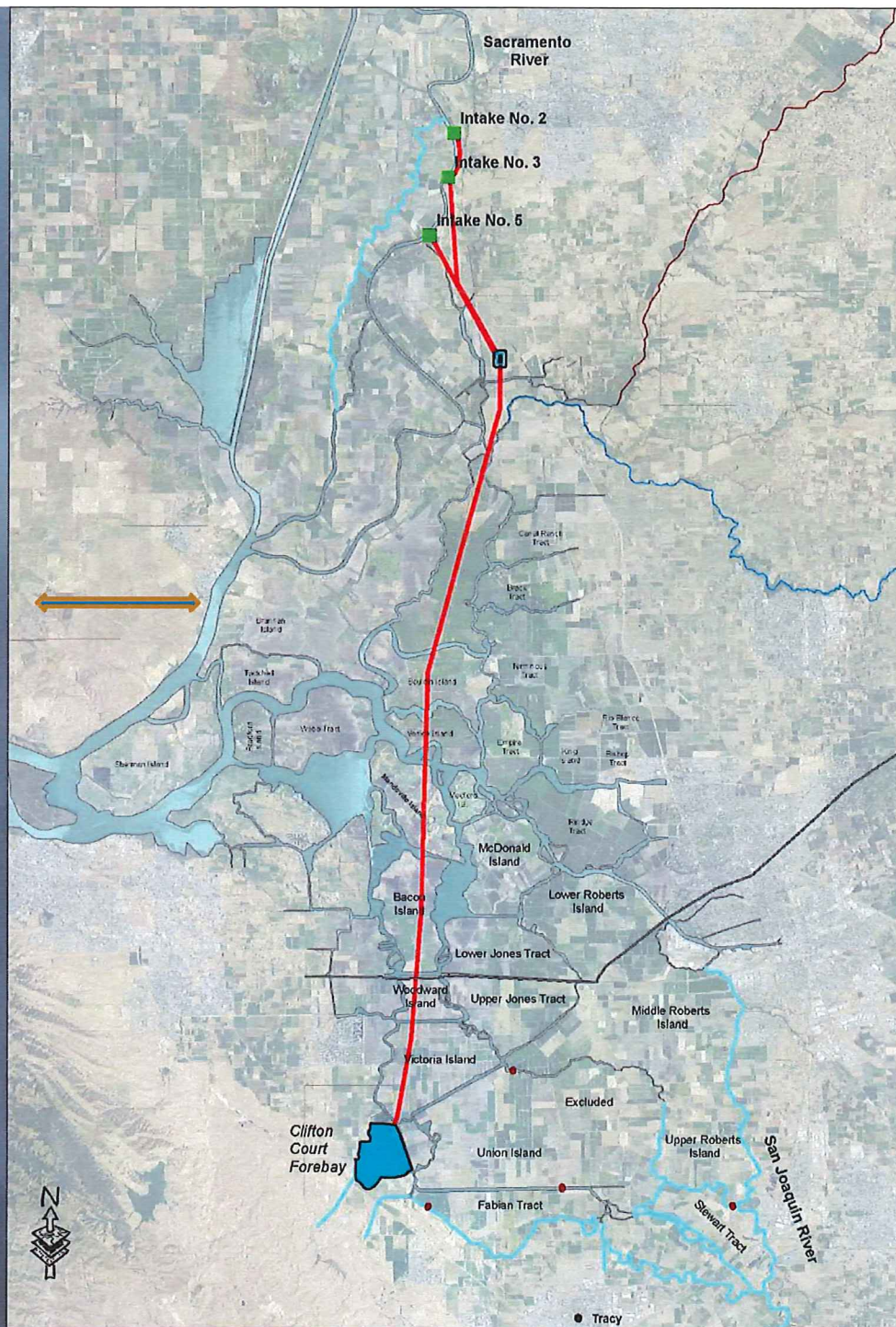
# Delta Schematic



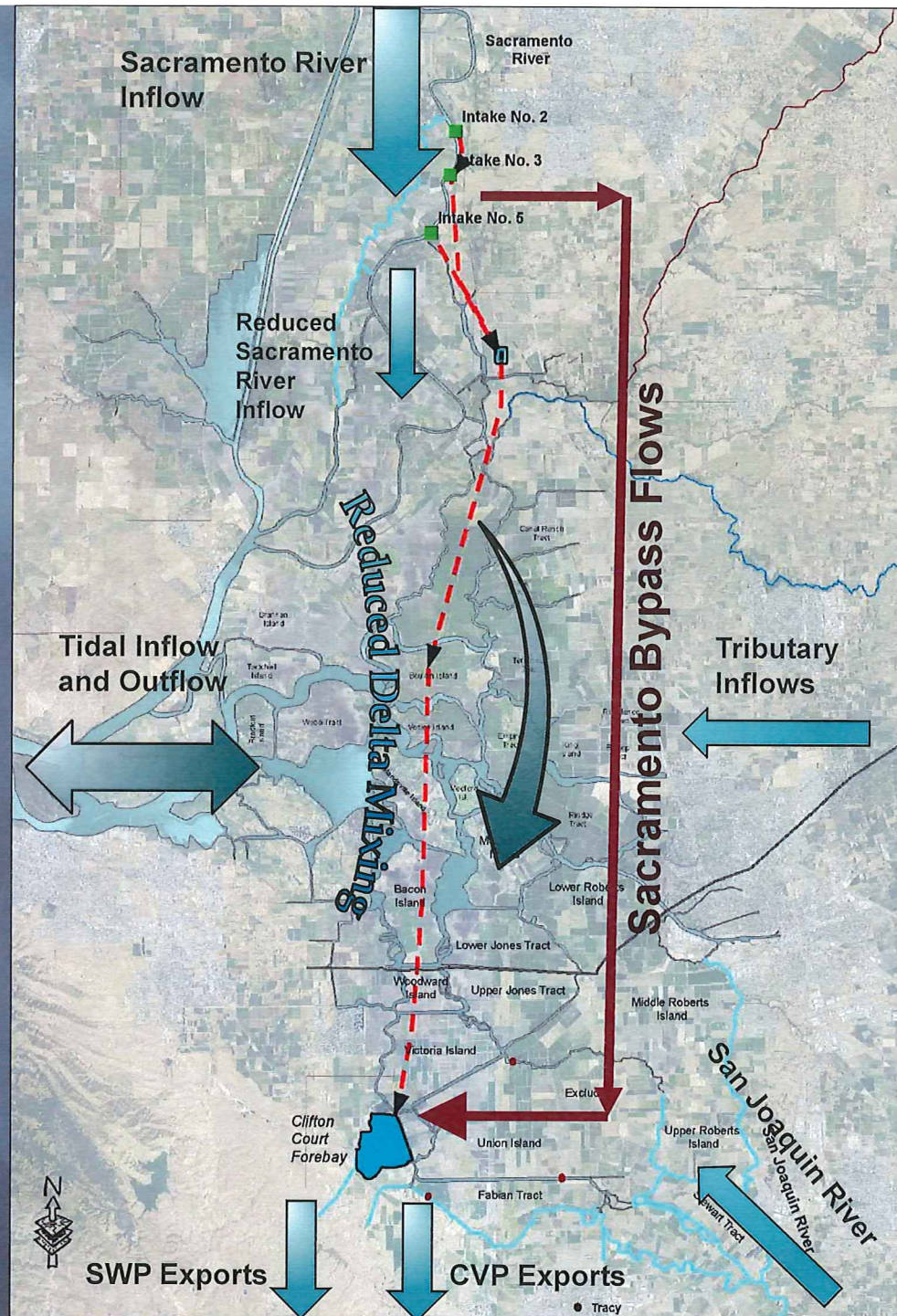
# Delta Schematic



# CFW Schematic



# CFW Schematic





# Approach To Analyzing Reduced Sacramento Inflows

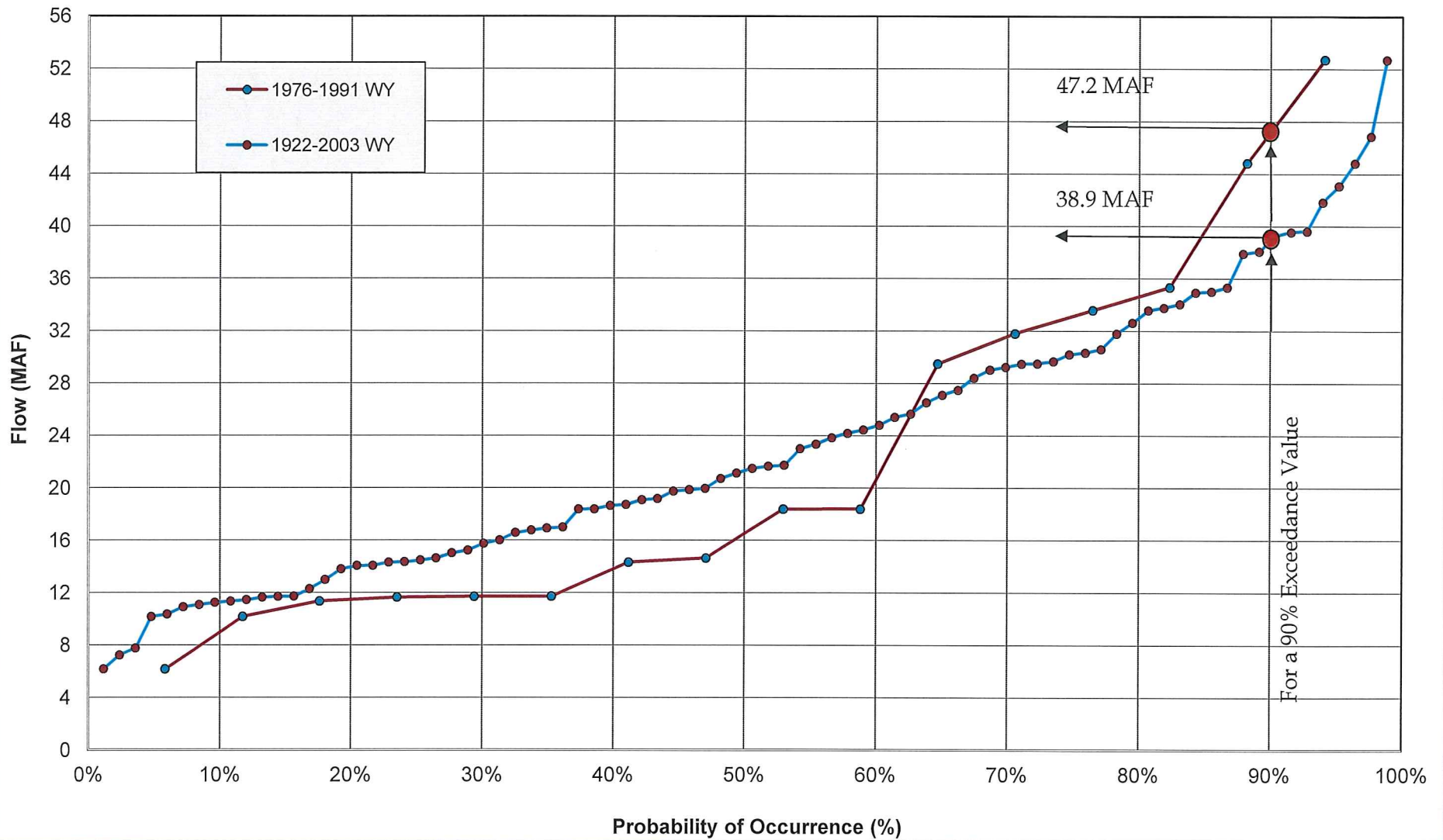
- ▣ Use Existing Models
- ▣ Set NAA at the Baseline
- ▣ Evaluate on a 15-minute and Daily Timeframe

# Modeling Timeframe

- ▣ CALSIM II
  - 82 Years
  
- ▣ DSM2
  - 16 Years
  
- ▣ Hydrologic Similarity Between Time Periods

# Probability Comparison

Figure 3-1 Comparison of the 8-River Runoff For The 1976-1991 Period and the 1922-2003 Period

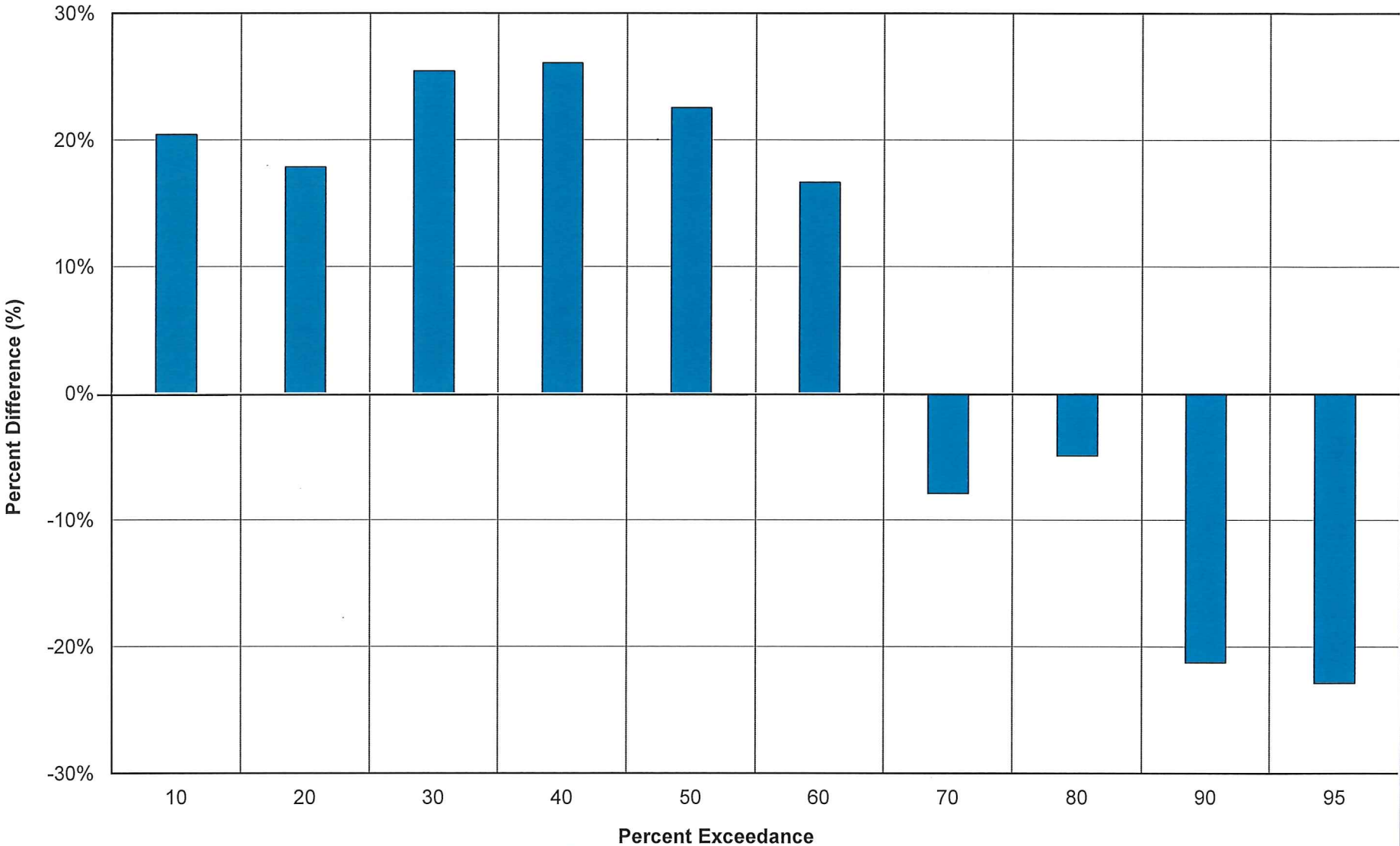


## Difference in Exceedance Predictions

<b>% Exceedance</b>	<b>Water Year 1922 - 2003</b>	<b>Water Year 1976 - 1991</b>	<b>% Difference</b>
<b>10</b>	11.27	8.97	20.4%
<b>20</b>	13.96	11.47	17.9%
<b>30</b>	15.71	11.71	25.5%
<b>40</b>	18.67	13.8	26.1%
<b>50</b>	21.31	16.51	22.5%
<b>60</b>	24.73	20.61	16.7%
<b>70</b>	29.26	31.57	-7.9%
<b>80</b>	33	34.63	-4.9%
<b>90</b>	38.91	47.18	-21.3%
<b>95</b>	42.88	52.69	-22.9%

# Difference in Exceedance Predictions

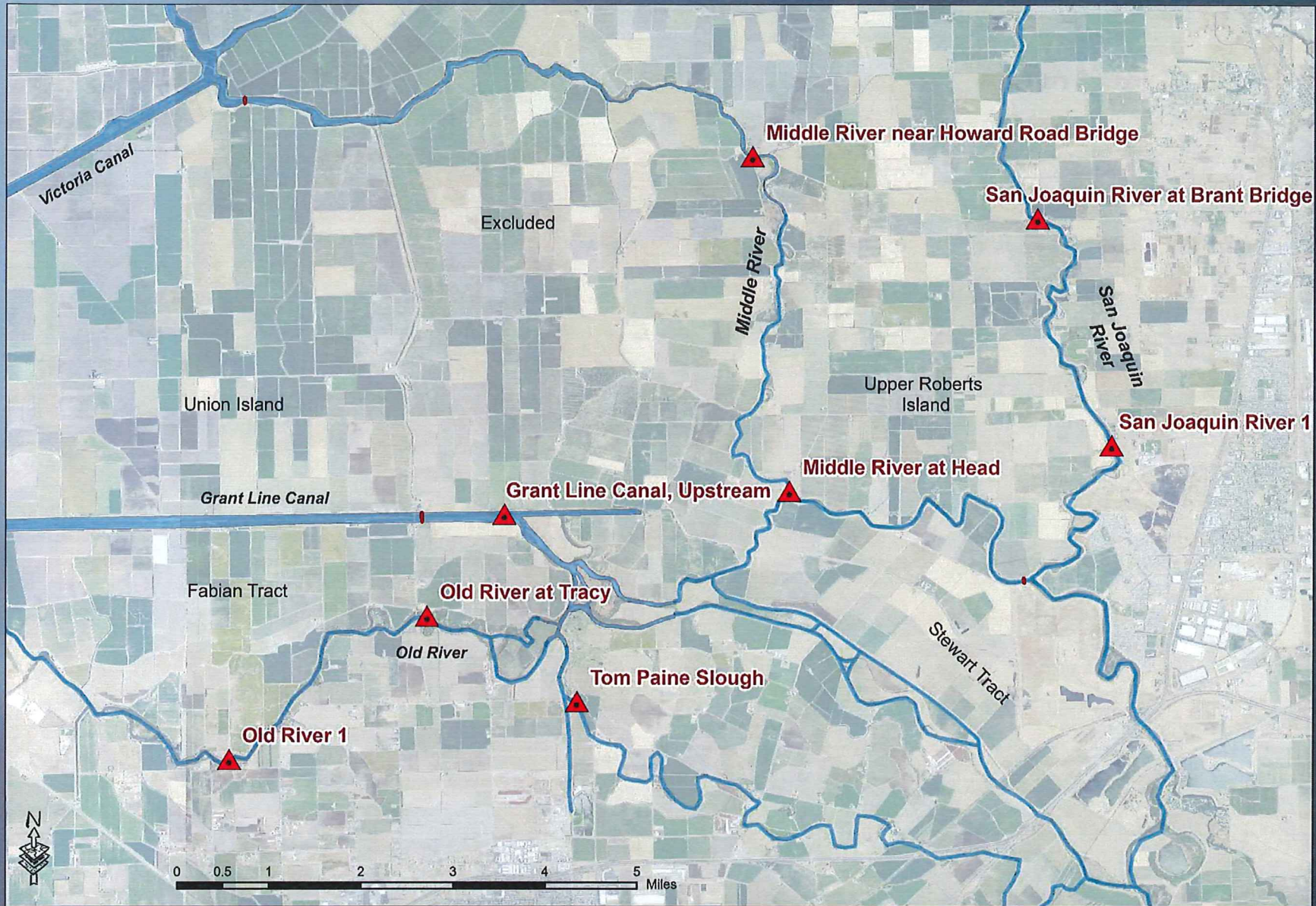
Exceedance Based on CALSIM II 82 Year Period vs Exceedance Based on DSM2 16 Year Period



# Selection of Analysis Points

- ▣ South Delta
- ▣ Central Delta
- ▣ Distribution and Problem Areas

# Detailed Analysis Points - 1

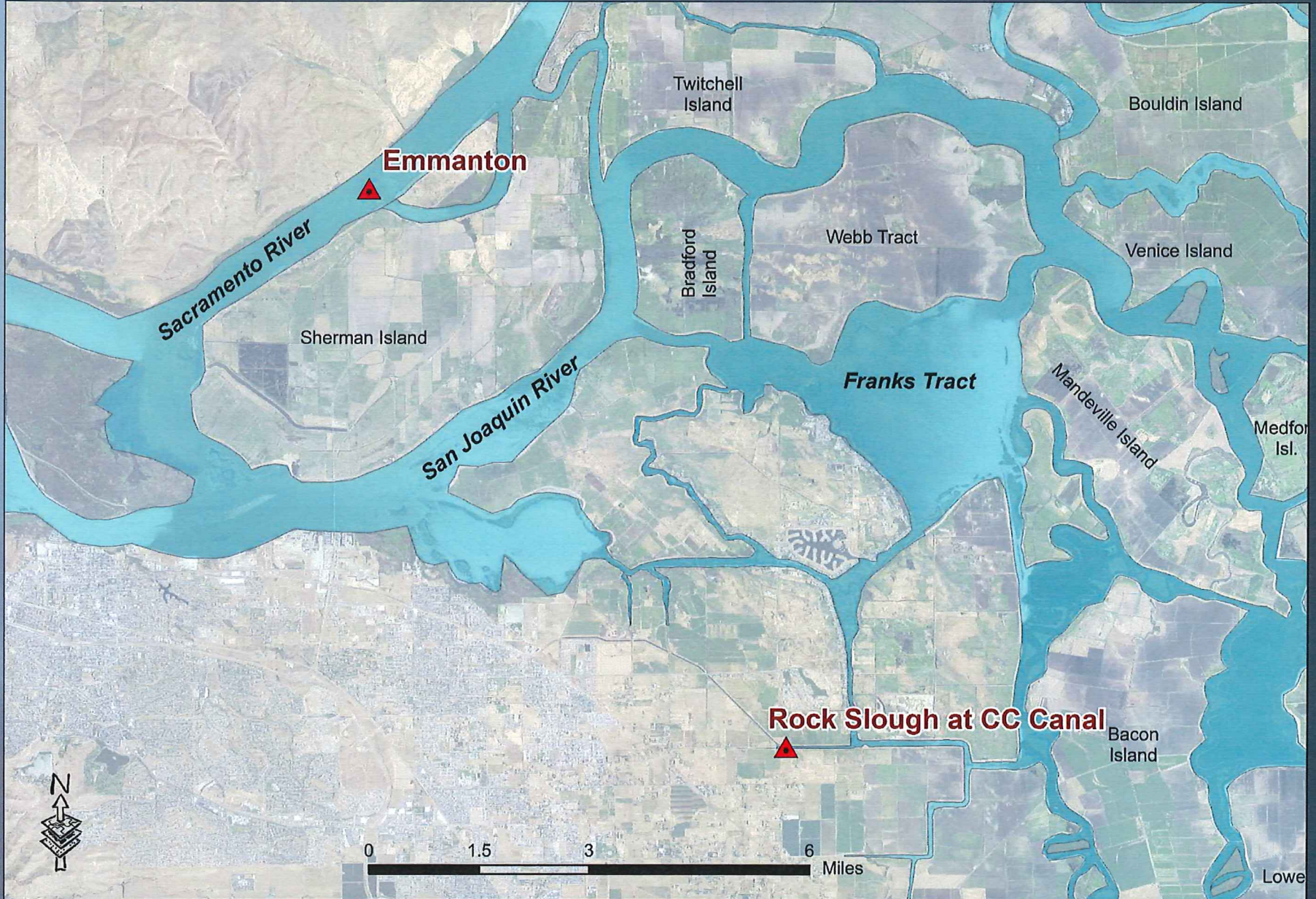


## Detailed Analysis Points - 2





# Detailed Analysis Points - 3

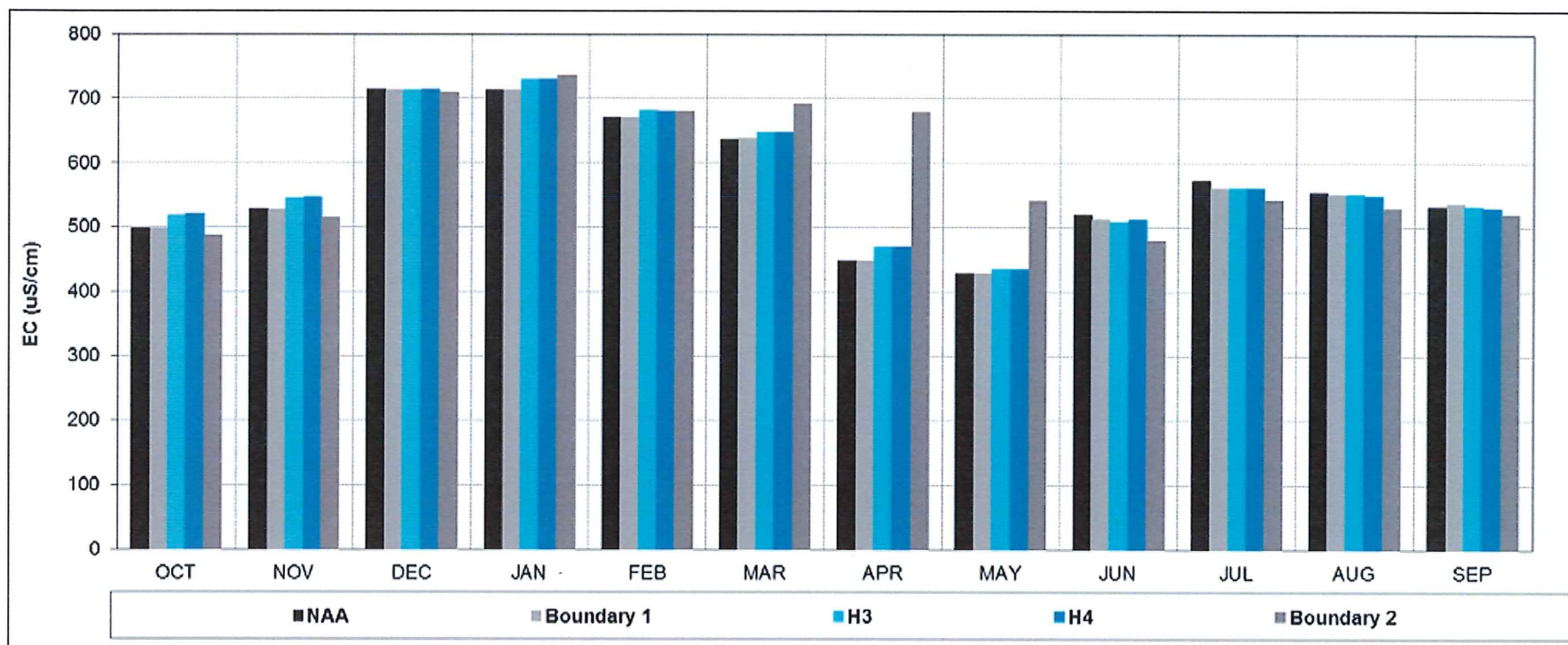


# Differences in Approach To Impact Analysis

- ▣ Timescale of Importance
  
- ▣ Averaging

# Monthly Average EC Old River at Tracy Road

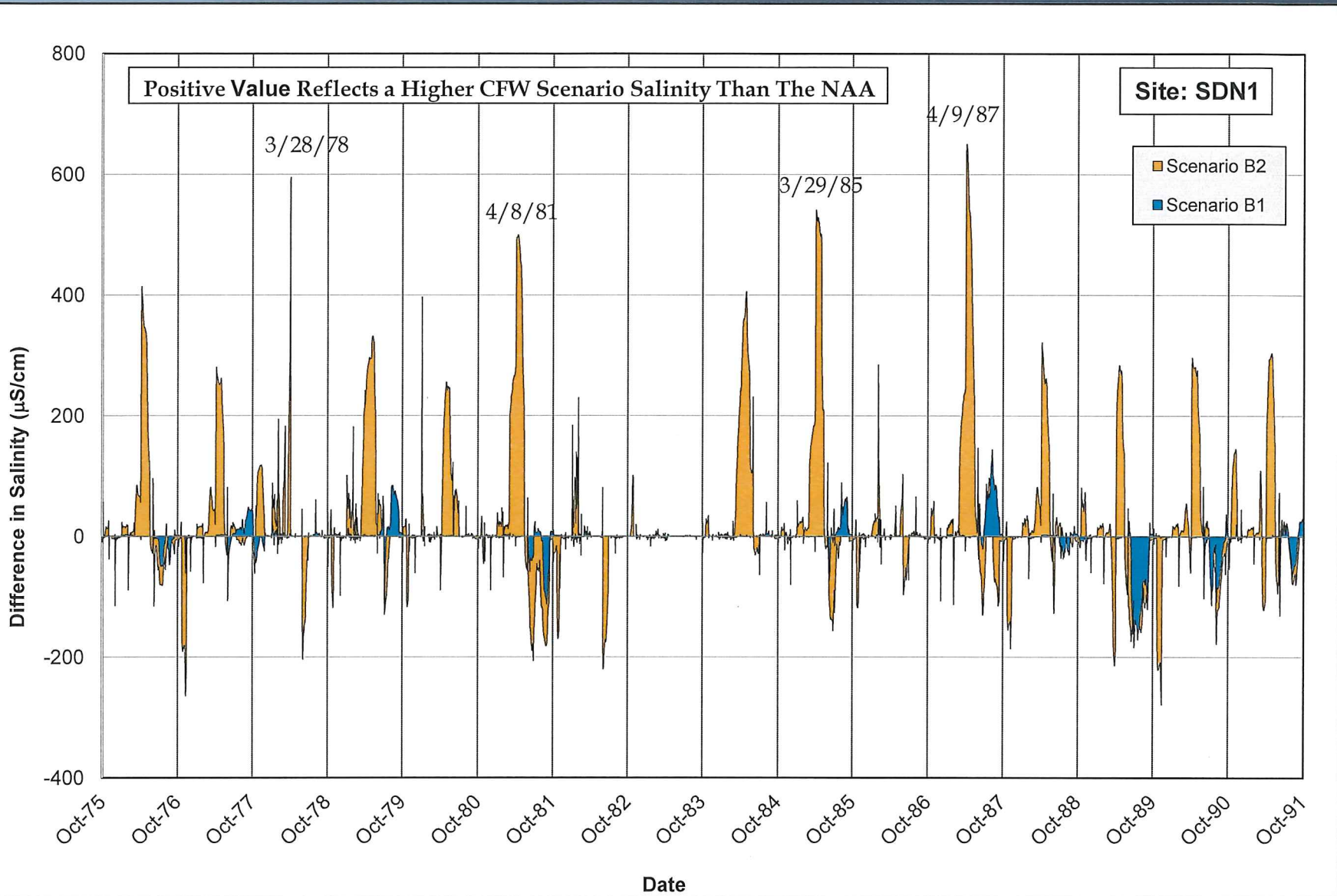
Figure EC5: Monthly Average EC at Old River at Tracy Road



*\*Model results are used for comparative purposes and not for predictive purposes*

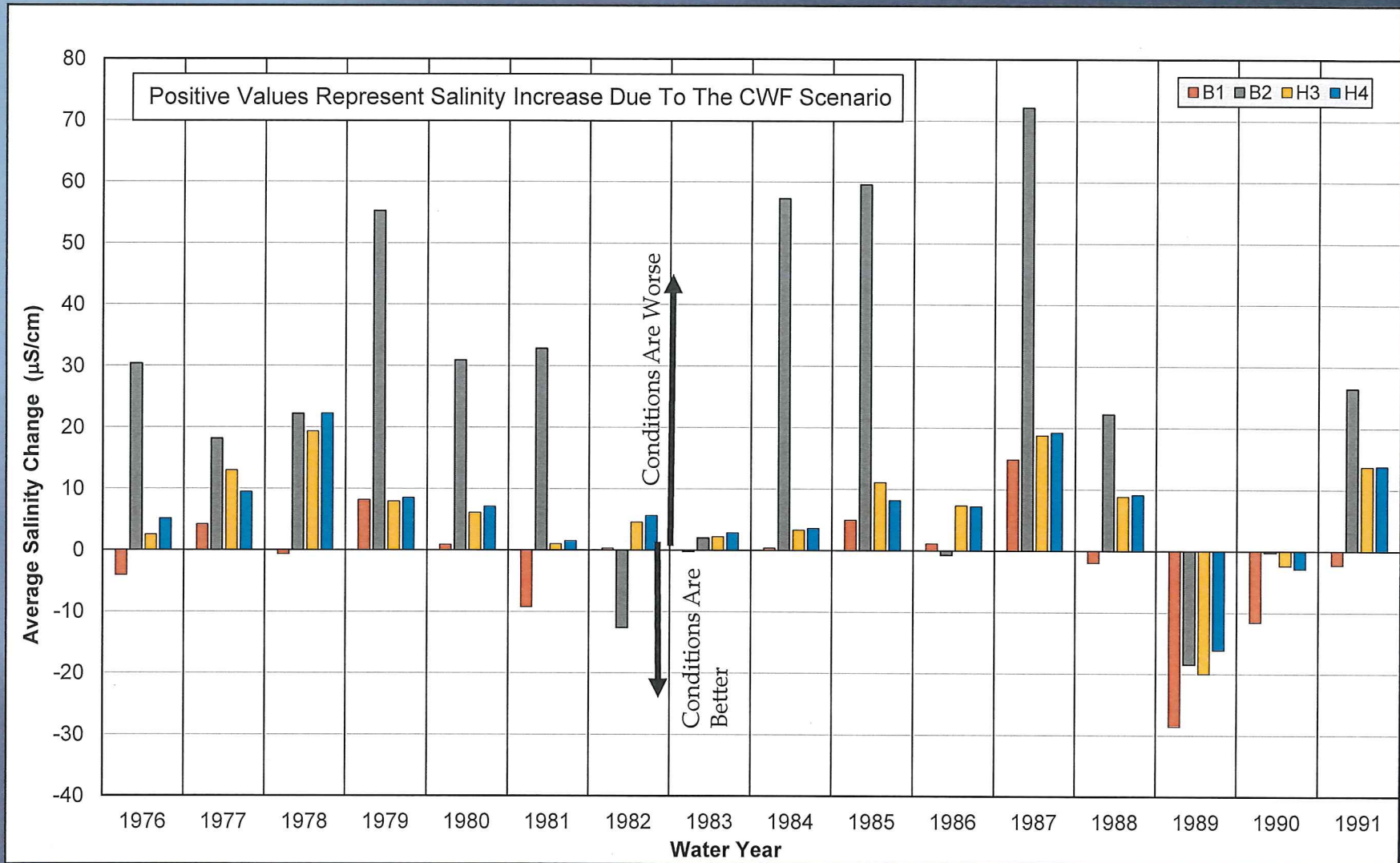
From DWR Exhibit 513, Figure EC-5

# Difference between Mean Daily CWF and NAA Site: SDN1, Old River at Tracy

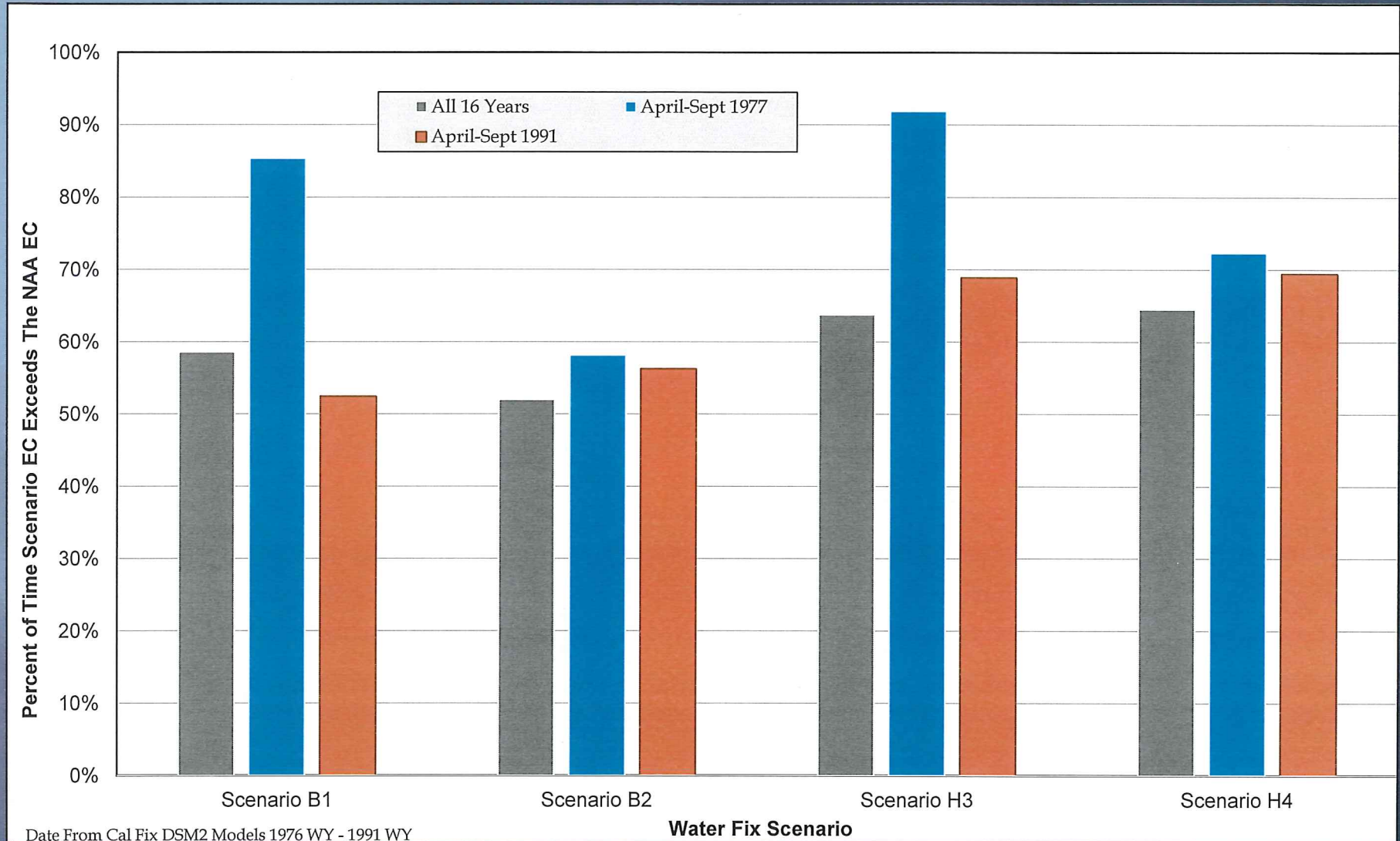


# Average Annual Salinity for CWF Scenarios As Compared to the NAA

## Site: SDN1, Old River at Tracy

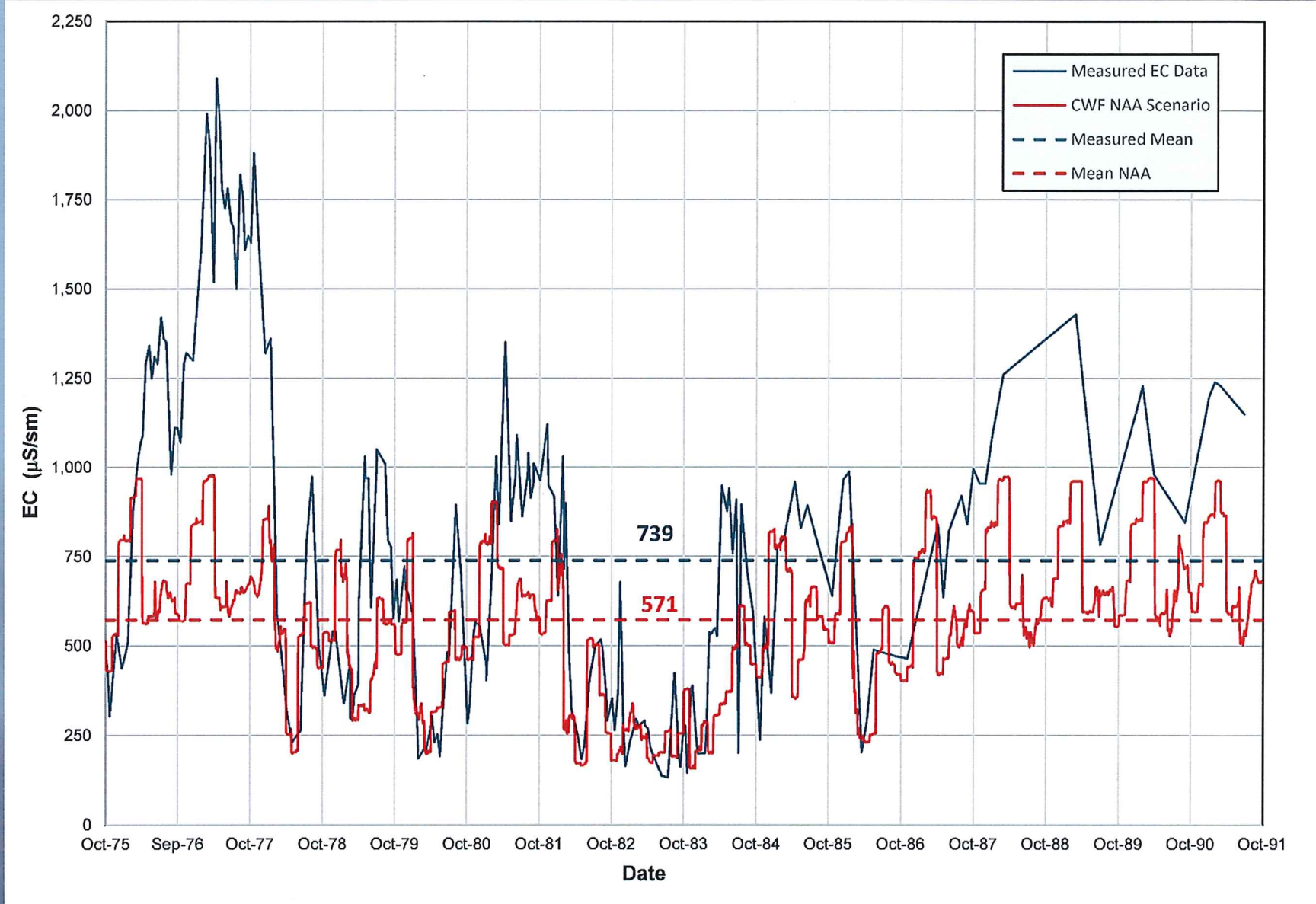


# Percent of Time the Daily Average EC of the WaterFix Scenarios Exceeds the EC of the NAA Site: SDN1, Old River at Tracy

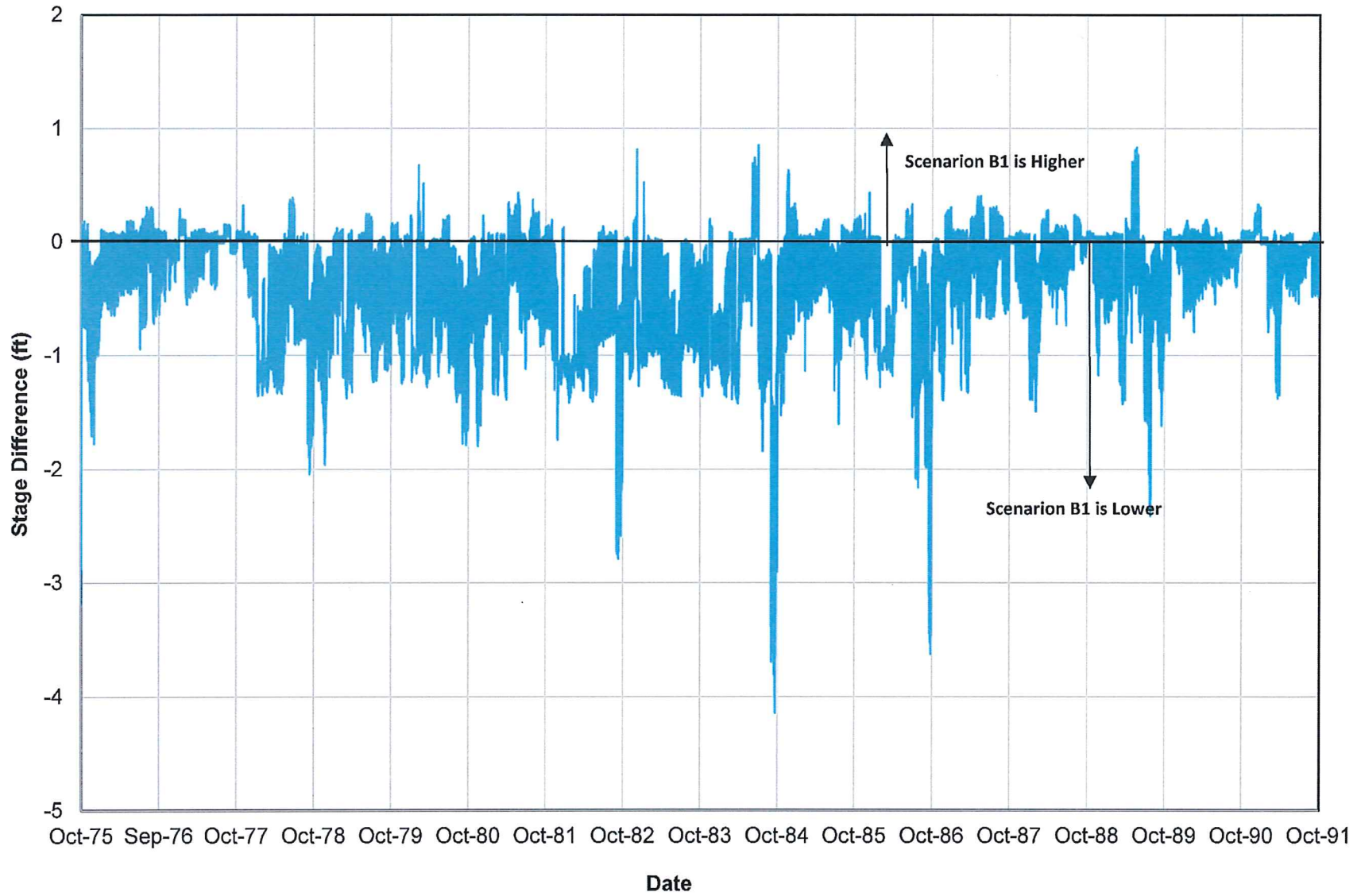


Date From Cal Fix DSM2 Models 1976 WY - 1991 WY

# Measured Salinity at Old River at Tracy and Predicted Salinity from the NAA

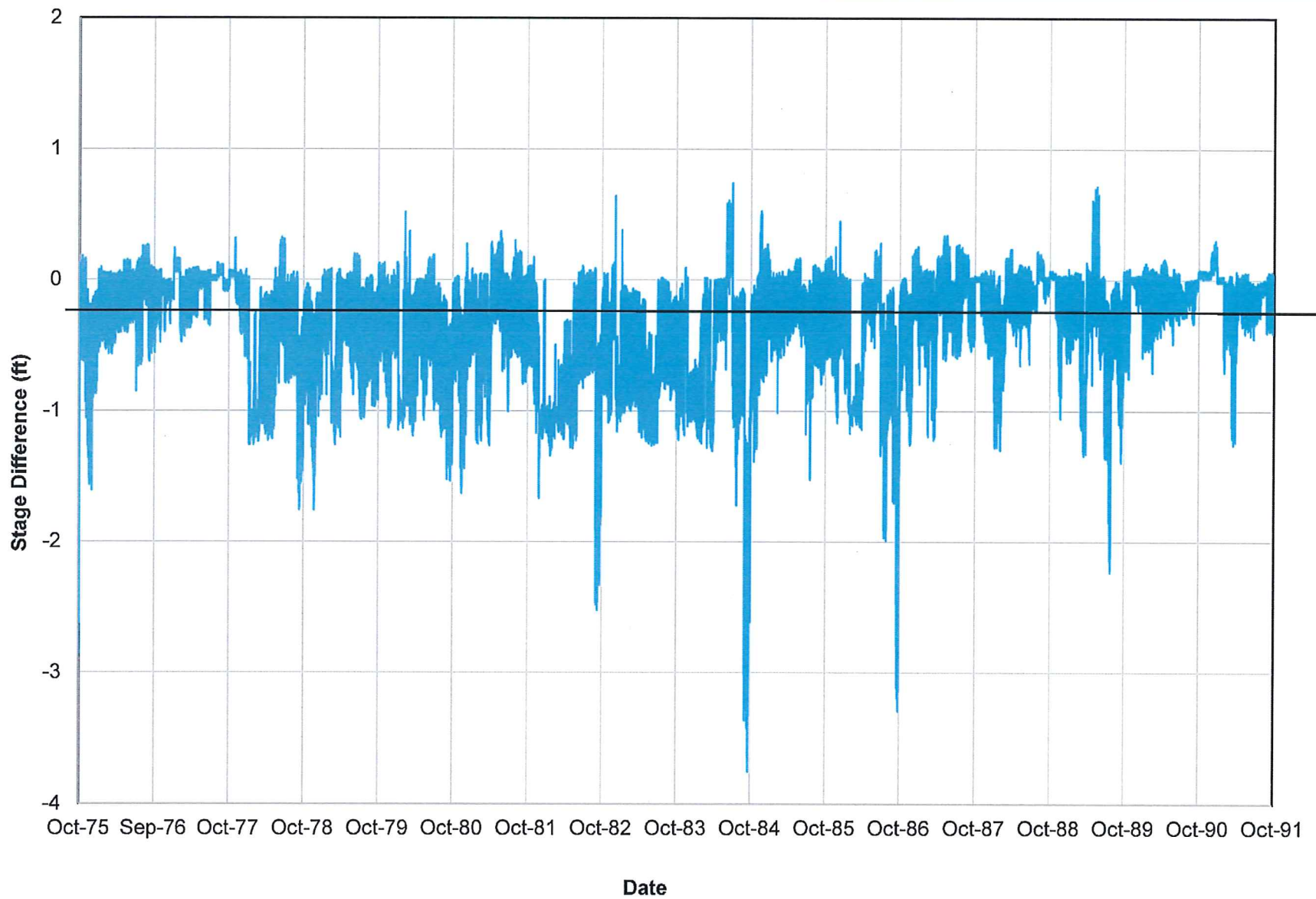


## Stage Difference DS of NDD No. 5

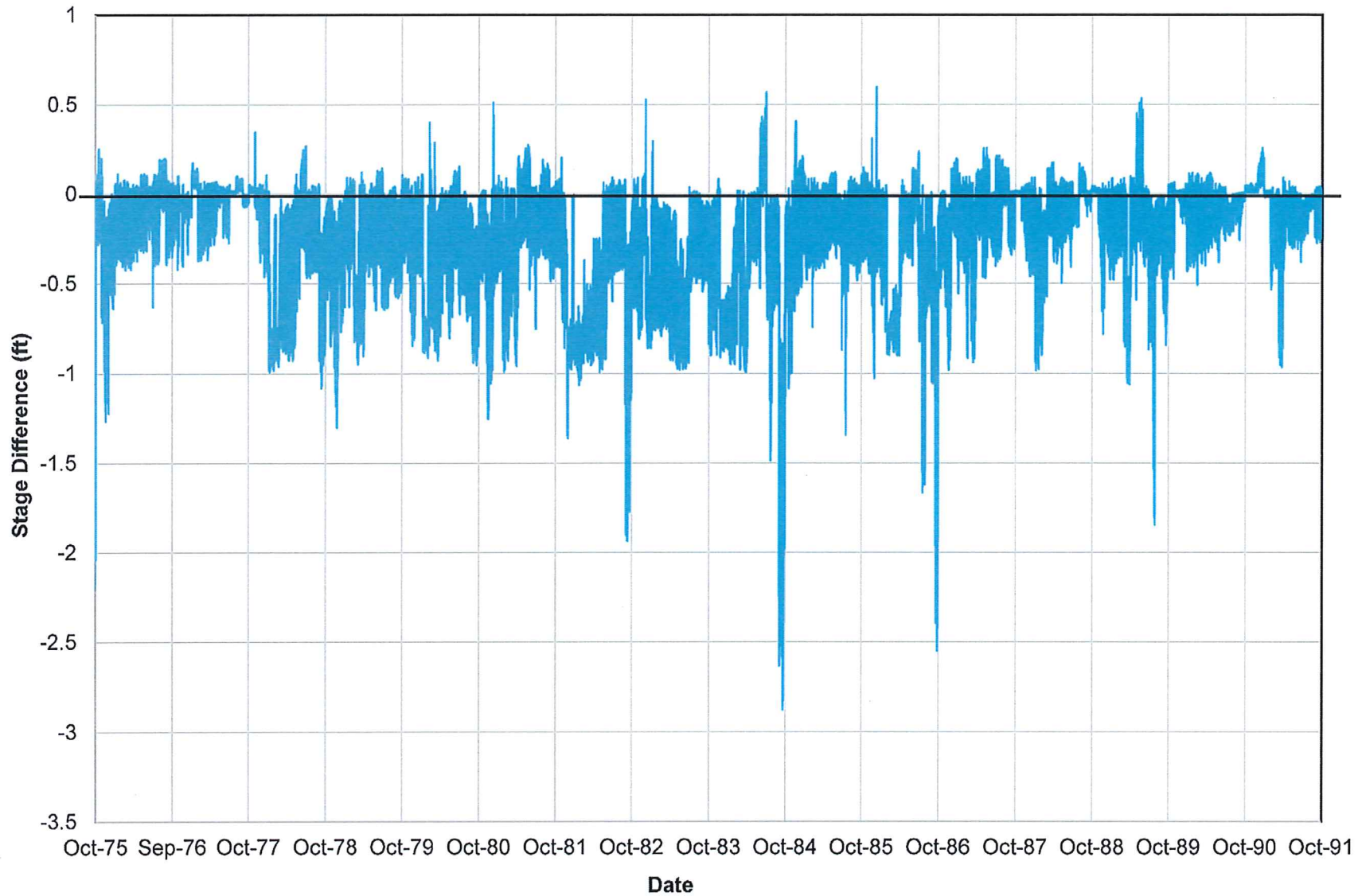




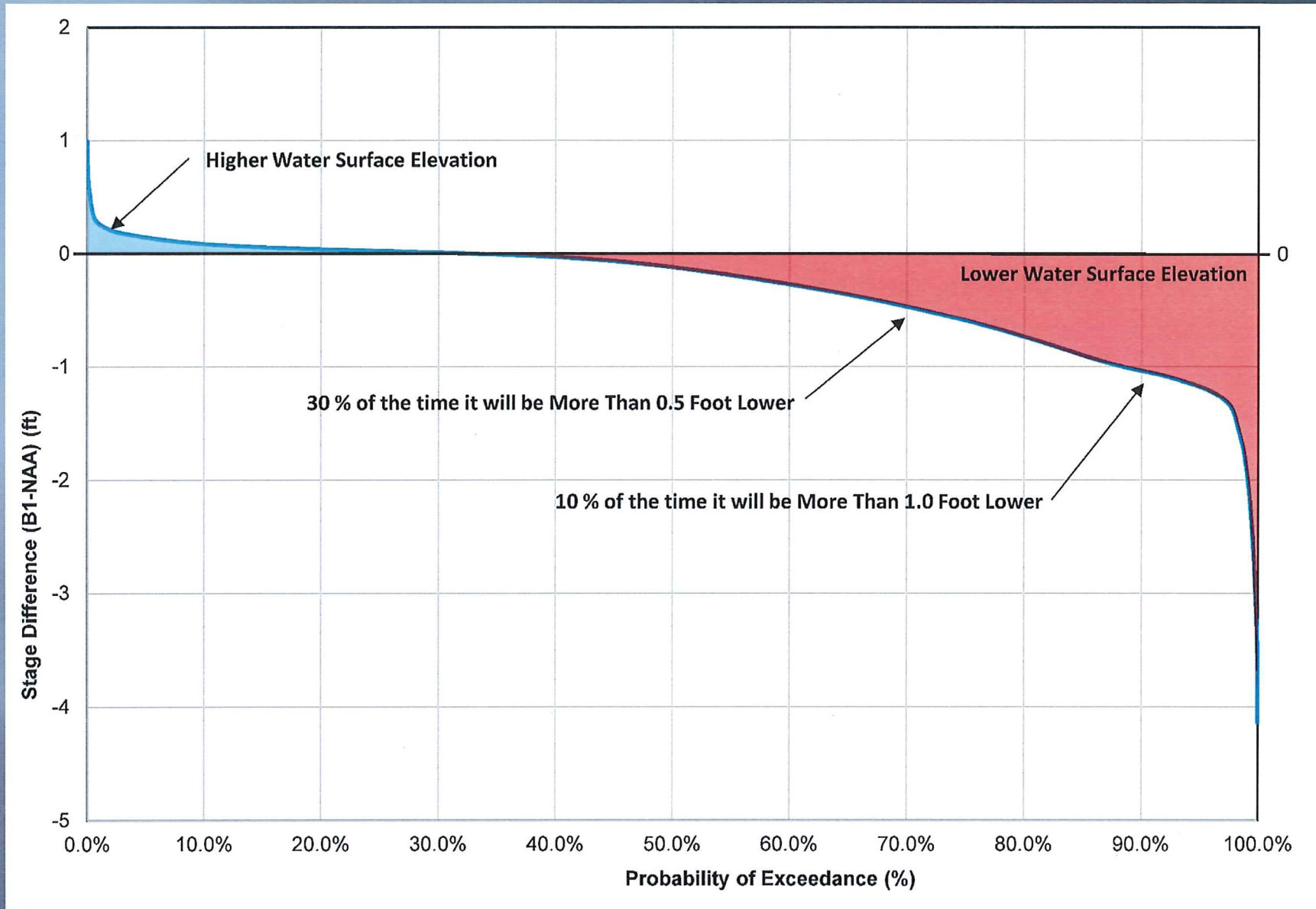
## Stage Difference 3 Miles DS of NDD



## Stage Difference 9 Miles DS of NDD



# Probability of Exceedance For Stage Change Due To The CWF



## Change In Residence Time

### Reduction in Flushing Flow For The CWF Scenarios As Compared To The NAA During a Dry Year.<sup>1</sup>

Scenario	Middle River	Old River
B1	-1.5 %	4.4 %
B2	-9.5 %	-42.0 %
H3	-4.3 %	-0.9 %
H4	-4.5 %	-1.2 %

1. A negative value indicates a reduction in volume moving through the system and a positive value indicates an increase in volume moving through the river.

# Conclusions

- ▣ The CWF will result in an Increase in Salinity in the Central and South Delta
  - Averaging Masks The True Increase
  - Sometimes High and Sometimes Low, But Generally Results in an Increase 50% of the Time

## Conclusions (Cont.)

- ▣ Stage in the Sacramento River Will Decrease DS of the NDD's
  - Up to 4' DS of the Diversion
  - Up To 3.7 ' 3 Miles DS of the Diversion
  - Up To 2.9' 9 Miles DS of the Diversion

## Conclusions (Cont.)

- ▣ Residence Time Will Increase in the Central and South Delta