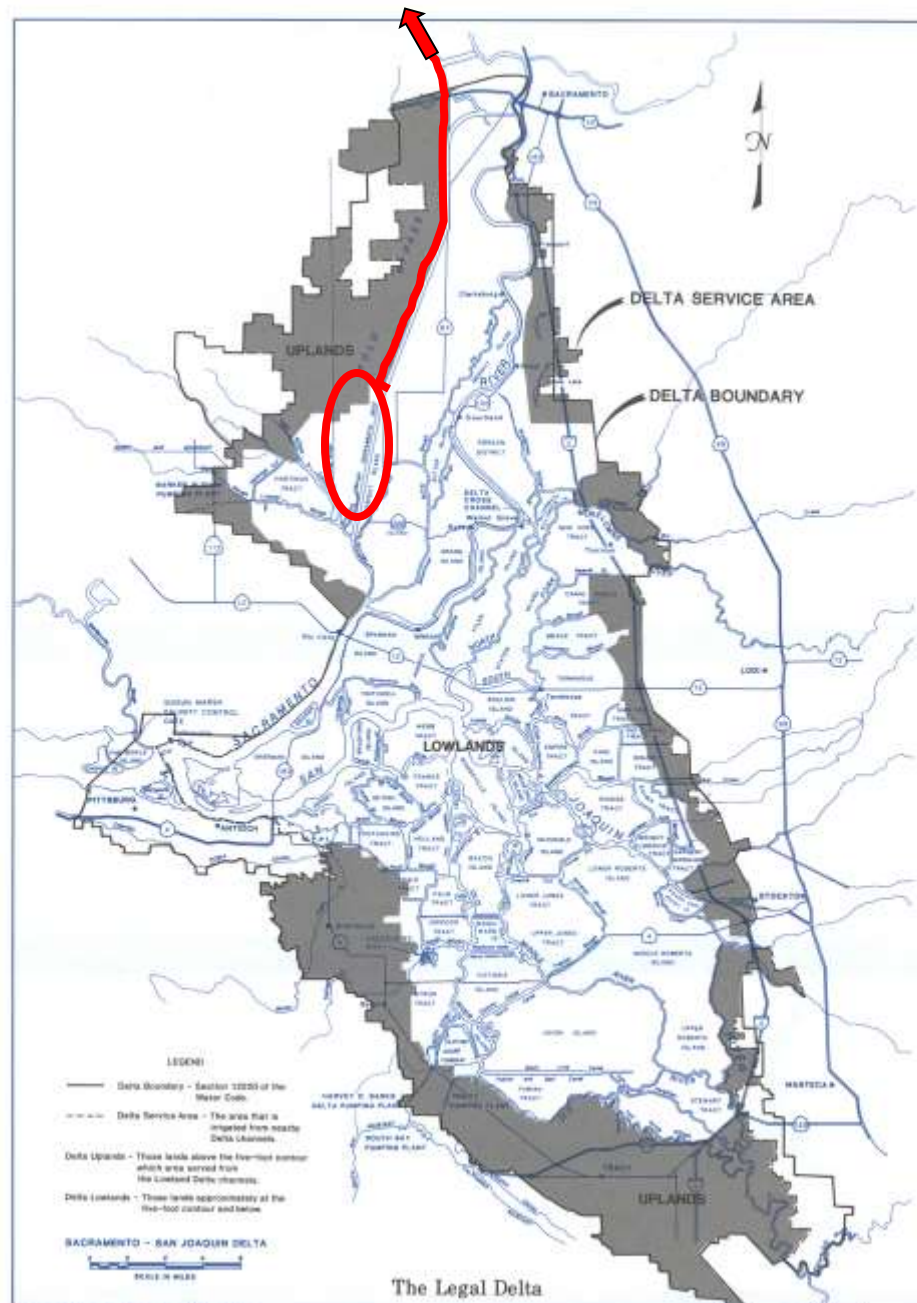


# Nutrient & Chlorophyll Concentrations in the Lower Yolo Bypass

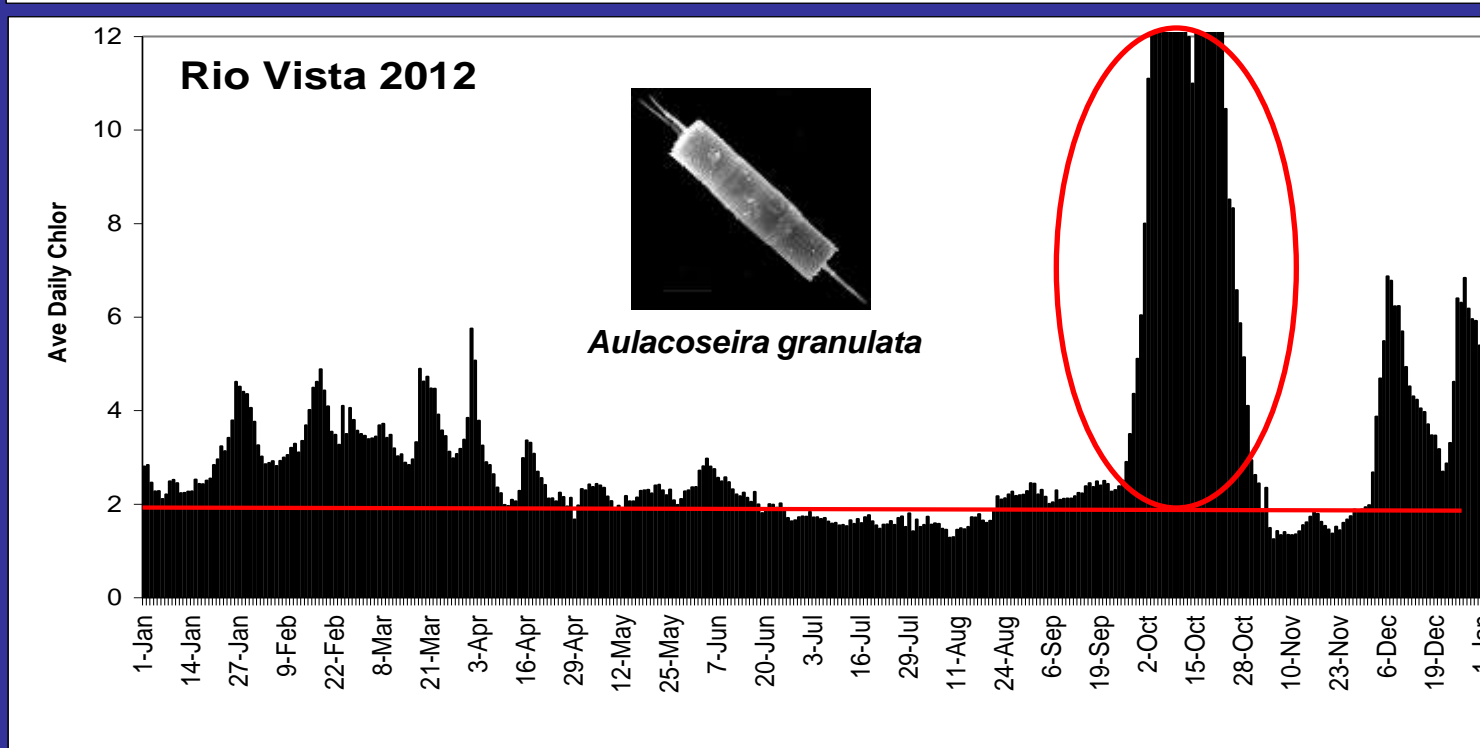
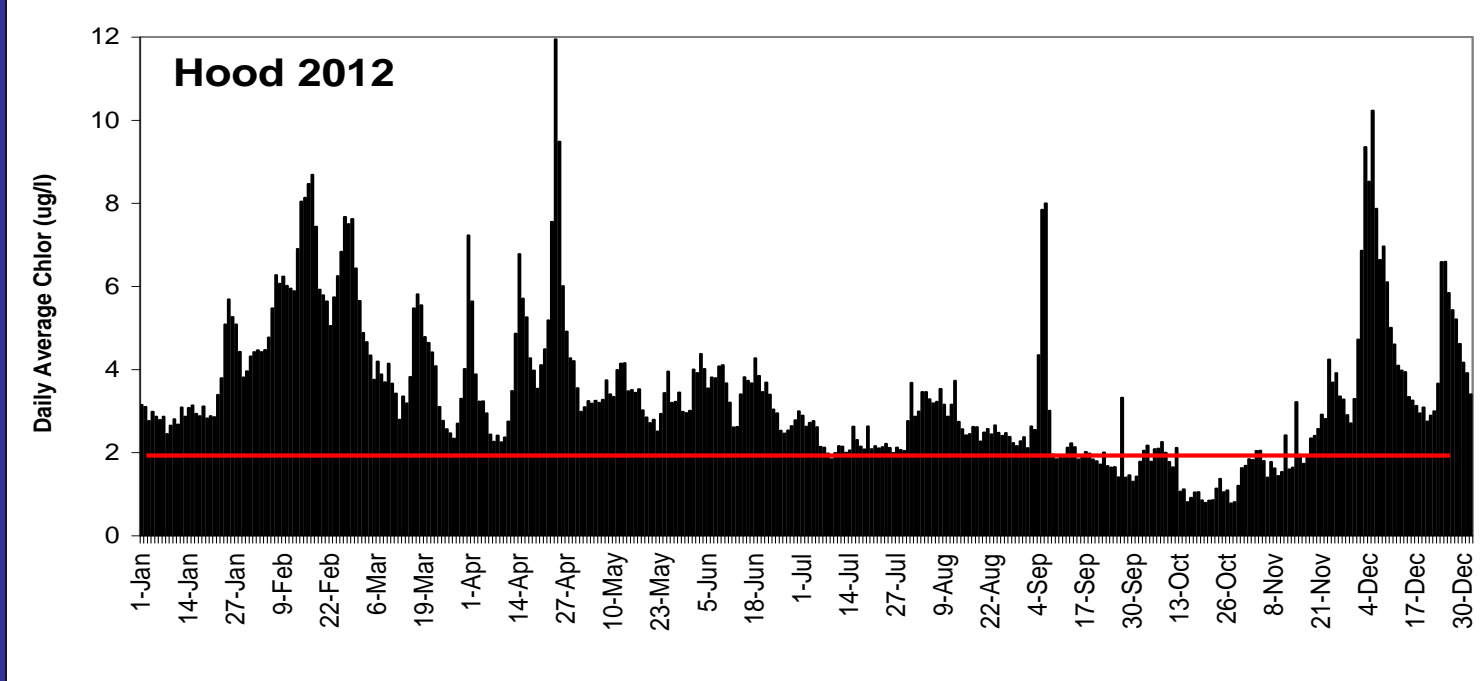
Chris Foe, Randy Dahlgren & Erwin Van Nieuwenhuysse



# Map of Delta with the lower Yolo Bypass & Toe Drain in red

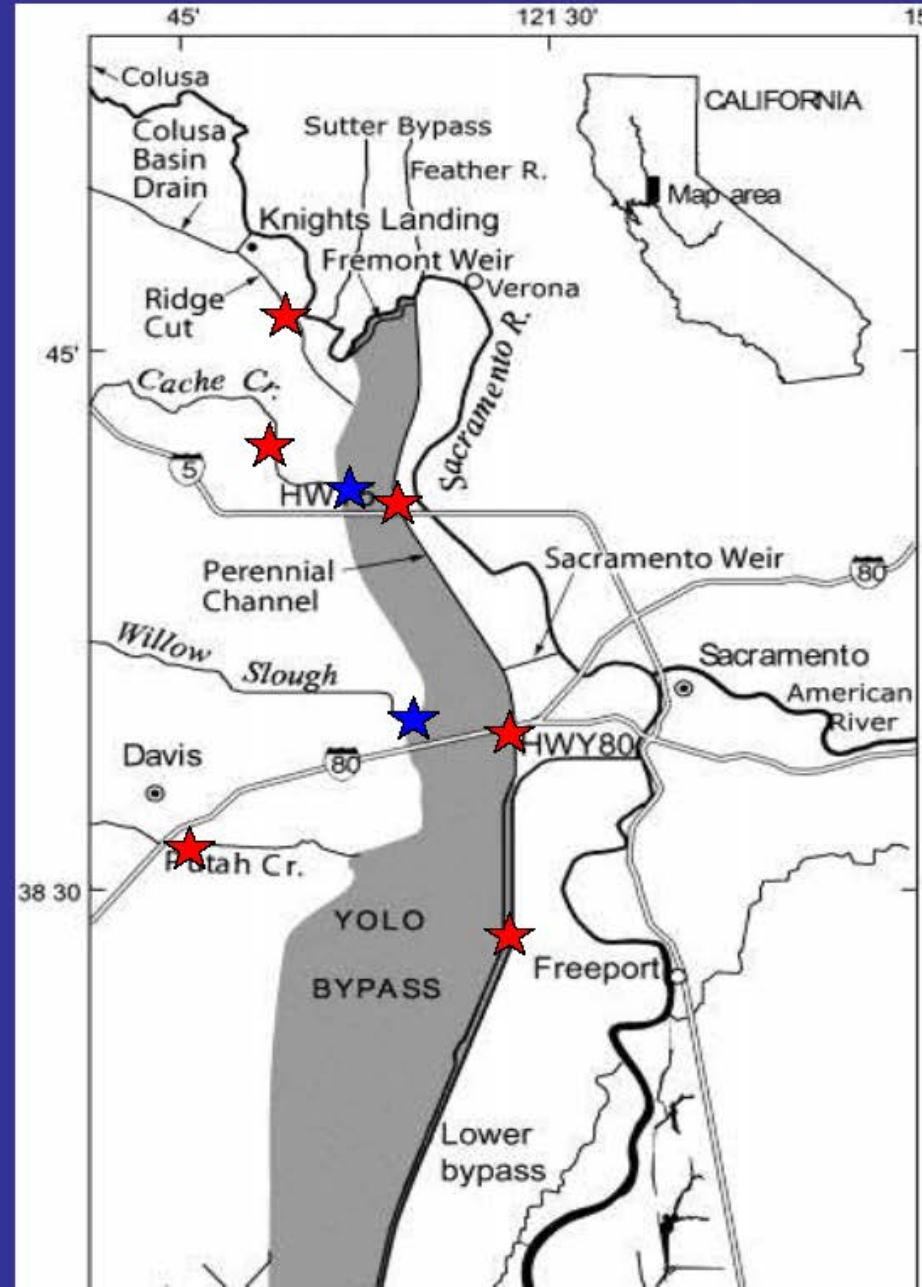
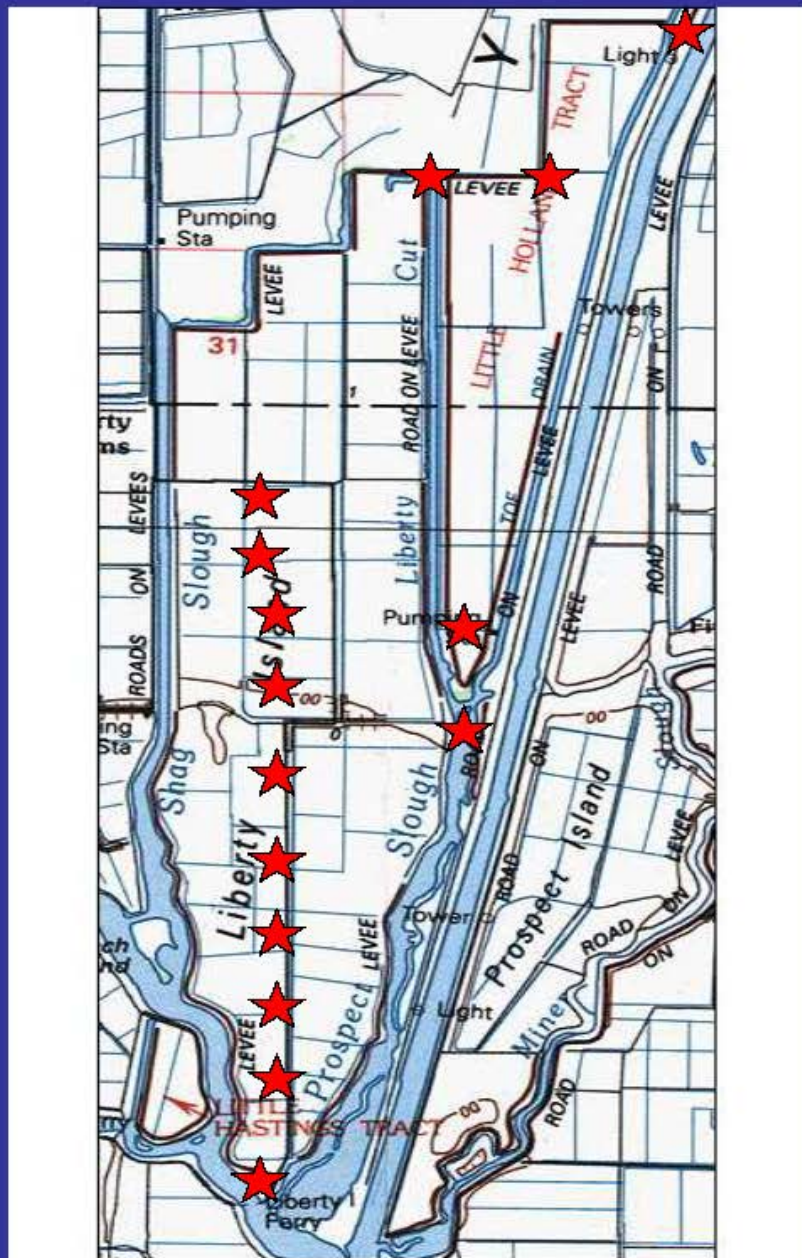


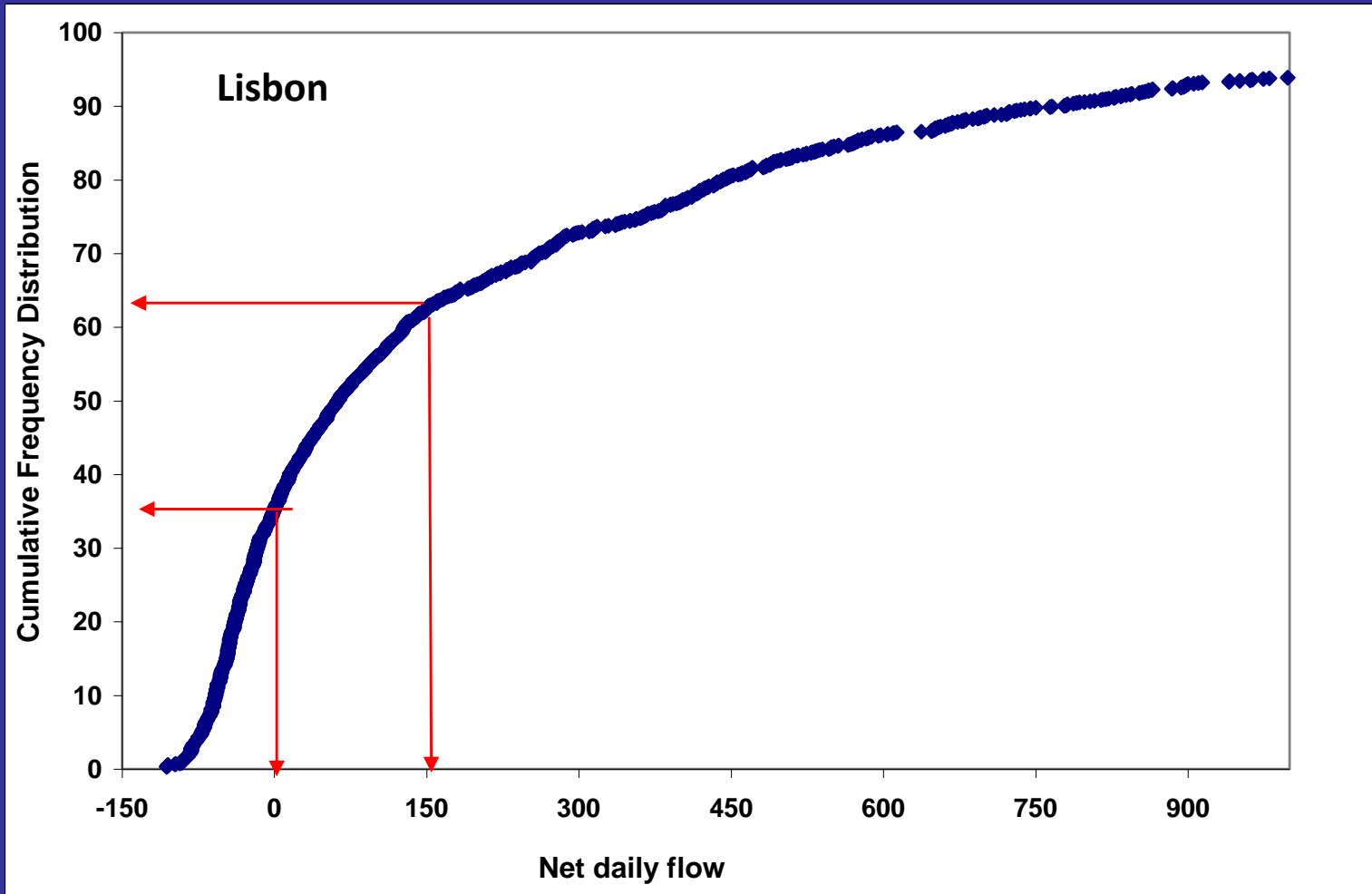
Comparison of average daily chlorophyll levels on the Sacramento River at Hood and Rio Vista in 2012





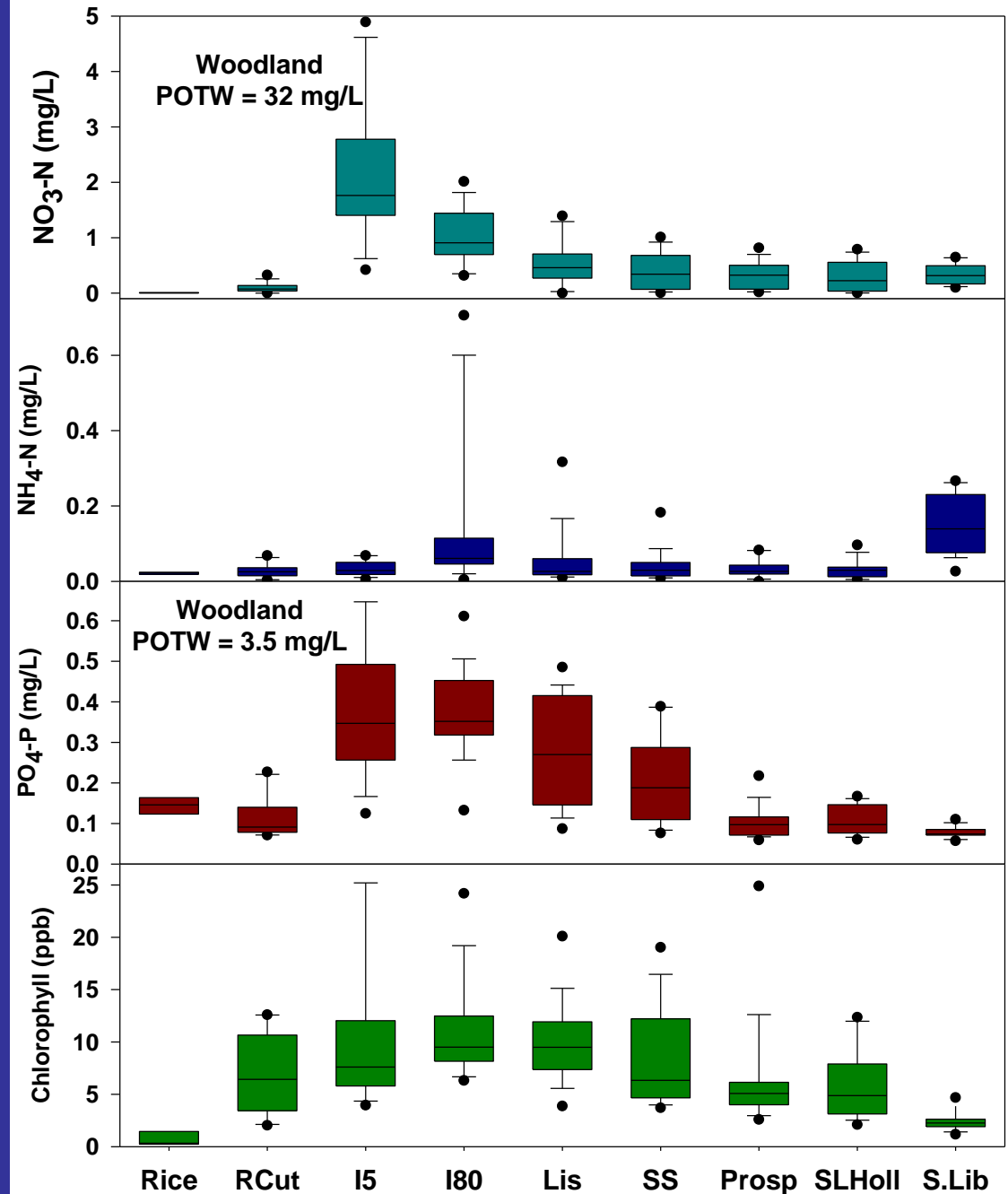
# Map of Yolo Bypass with Sampling Sites



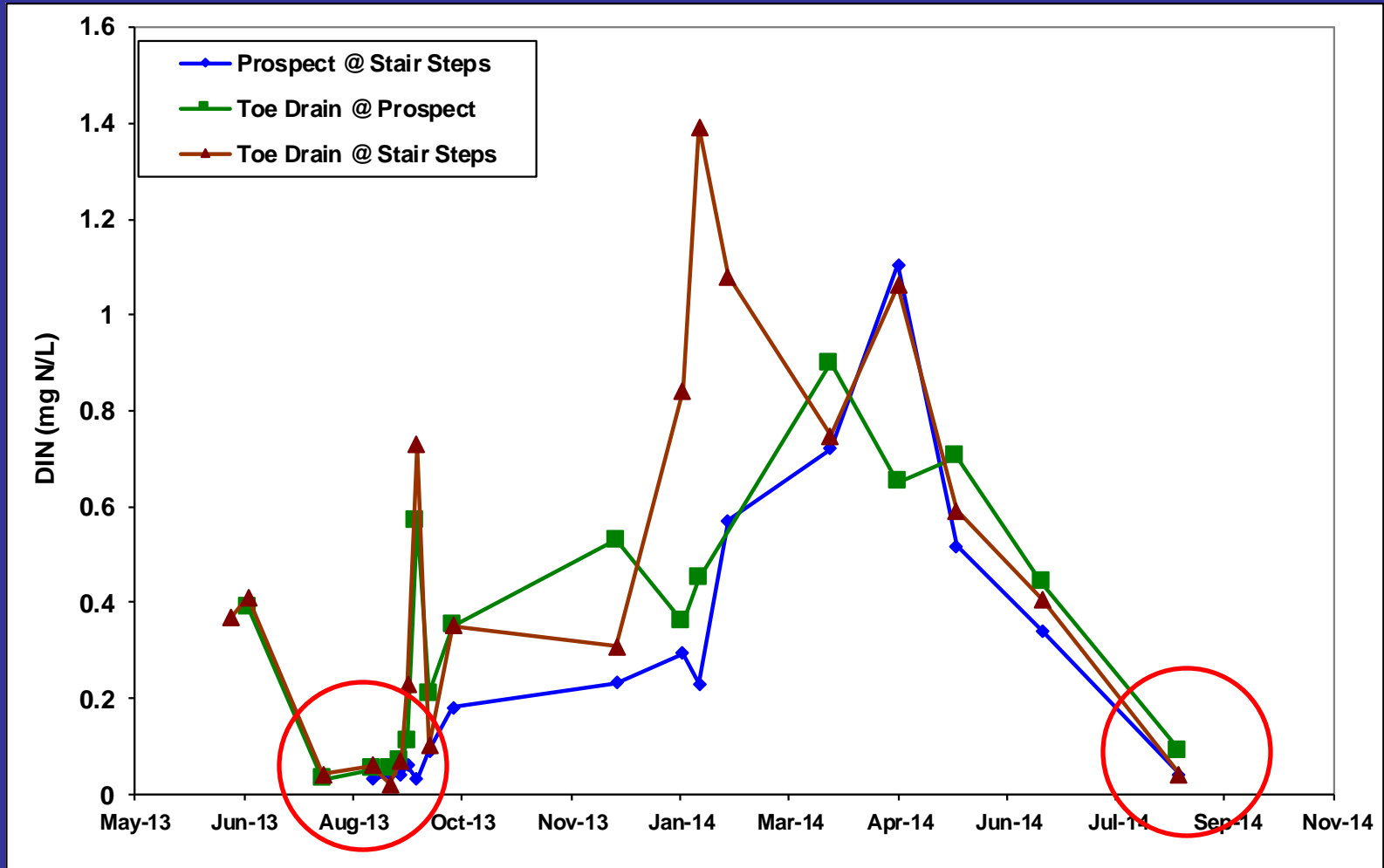


**Cumulative frequency distribution of summer flow at Lisbon (2005 – 2013). Summer = 1 April through 30 September. Flows are negative at Lisbon about 35% of time in summer. Average flow during 2013 rice discharge was 150-cfs.**

# Box & Whisker Plots of Annual Nutrient & Chlorophyll Levels in the Toe Drain and Channels in the Lower Yolo Bypass, June 2013 to August 2014

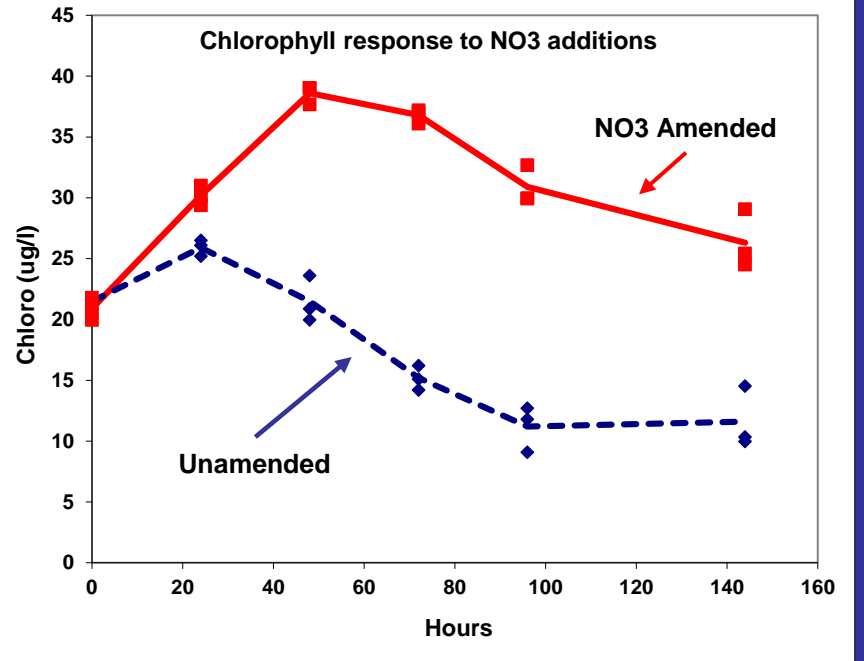
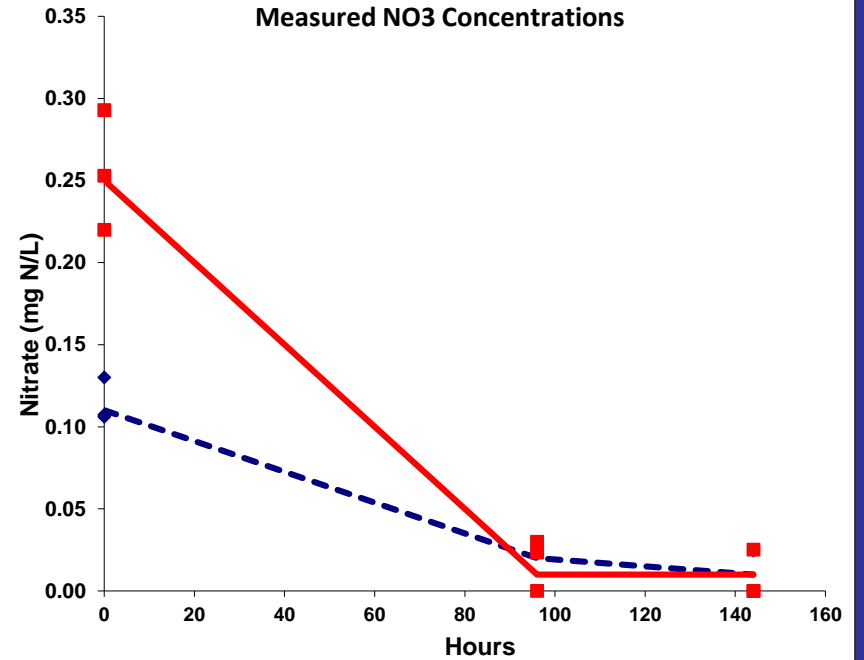


# DIN in Lower Yolo Bypass Channels



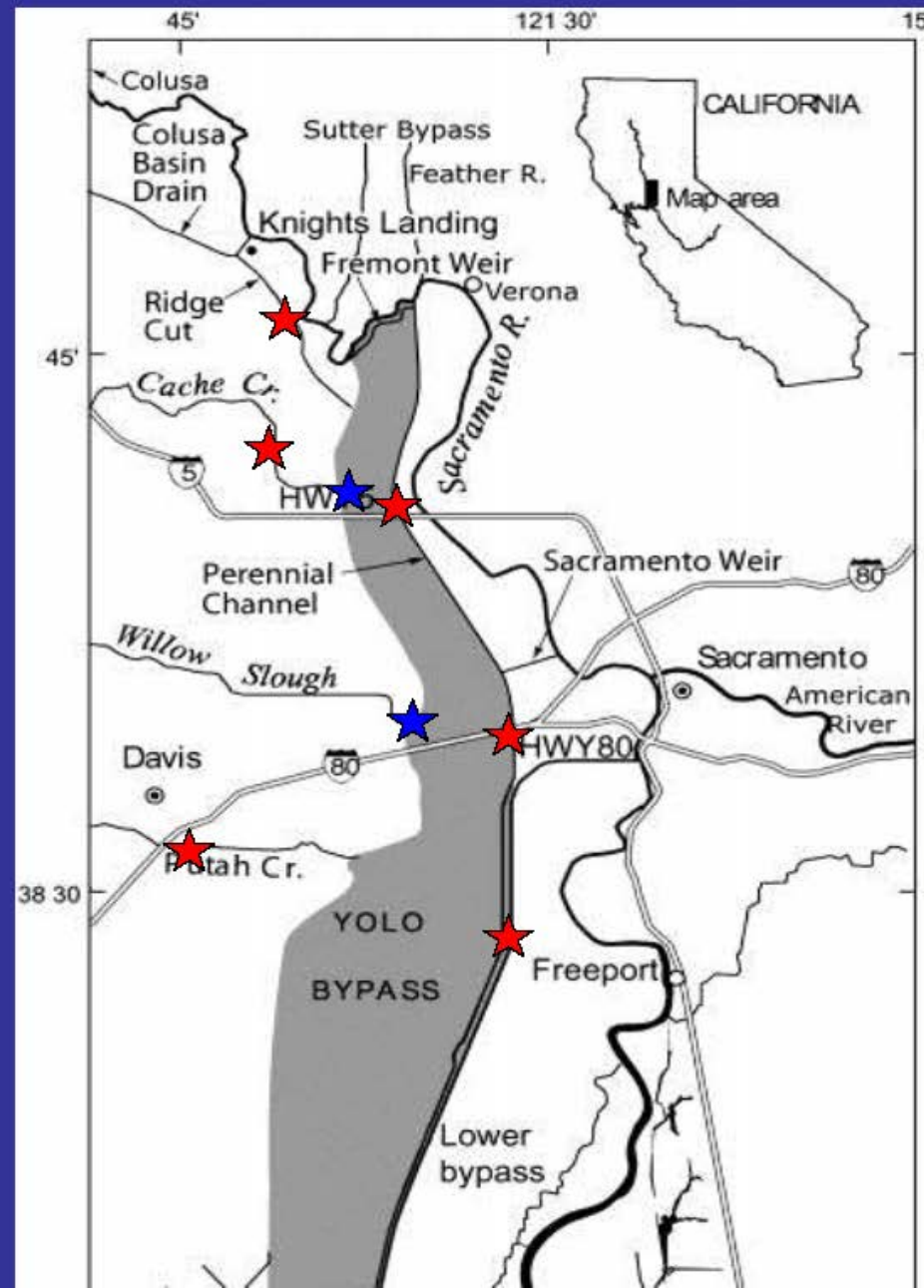
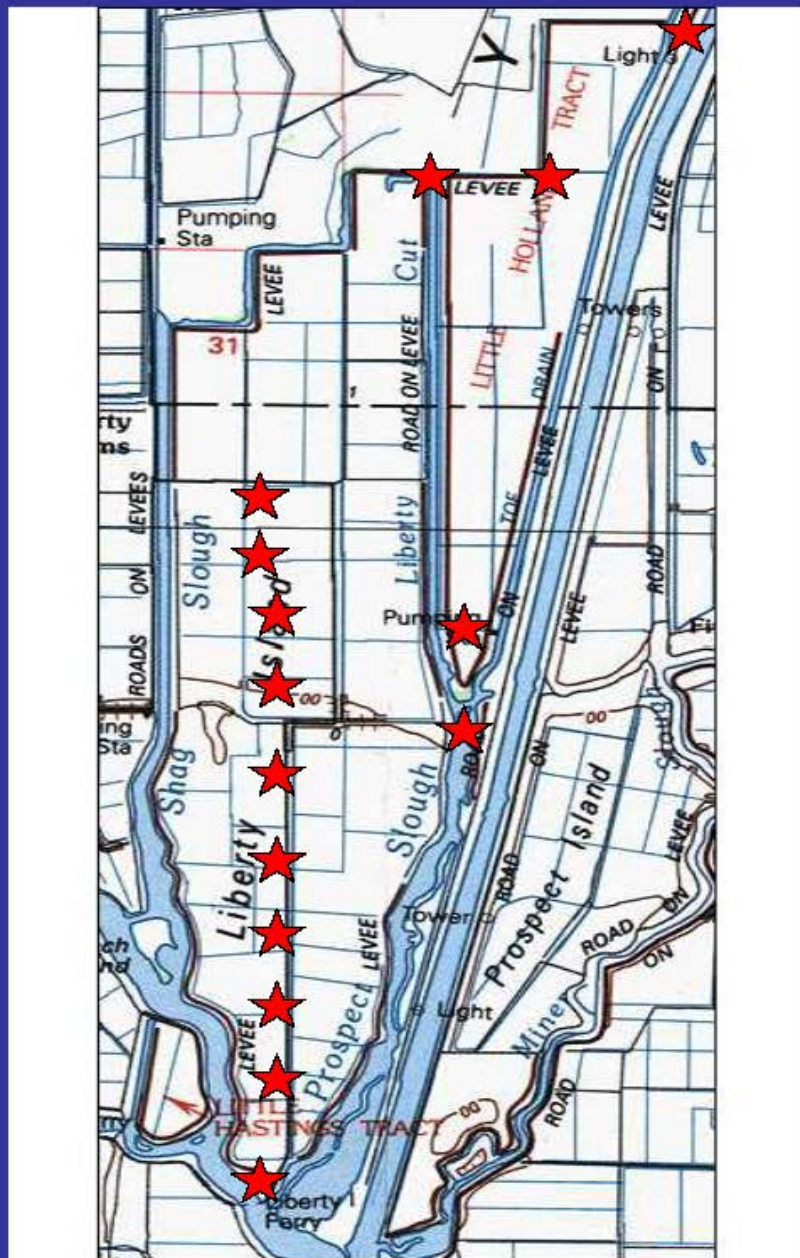


**Chlorophyll response to  $\text{NO}_3$  additions of water collected at Prospect Slough & the Stair Steps on 19 September 2013 and grown out in bottles.**





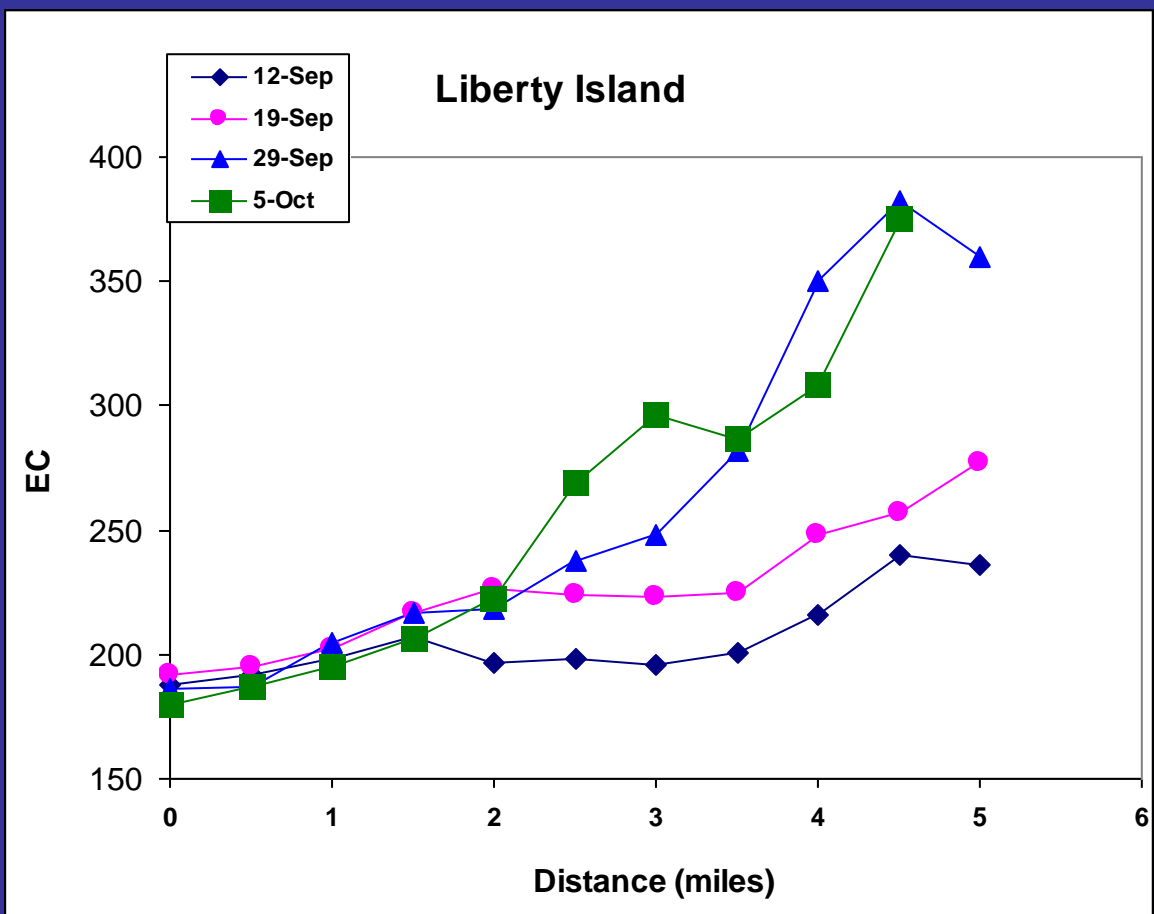
# Map of Yolo Bypass with Sampling Sites



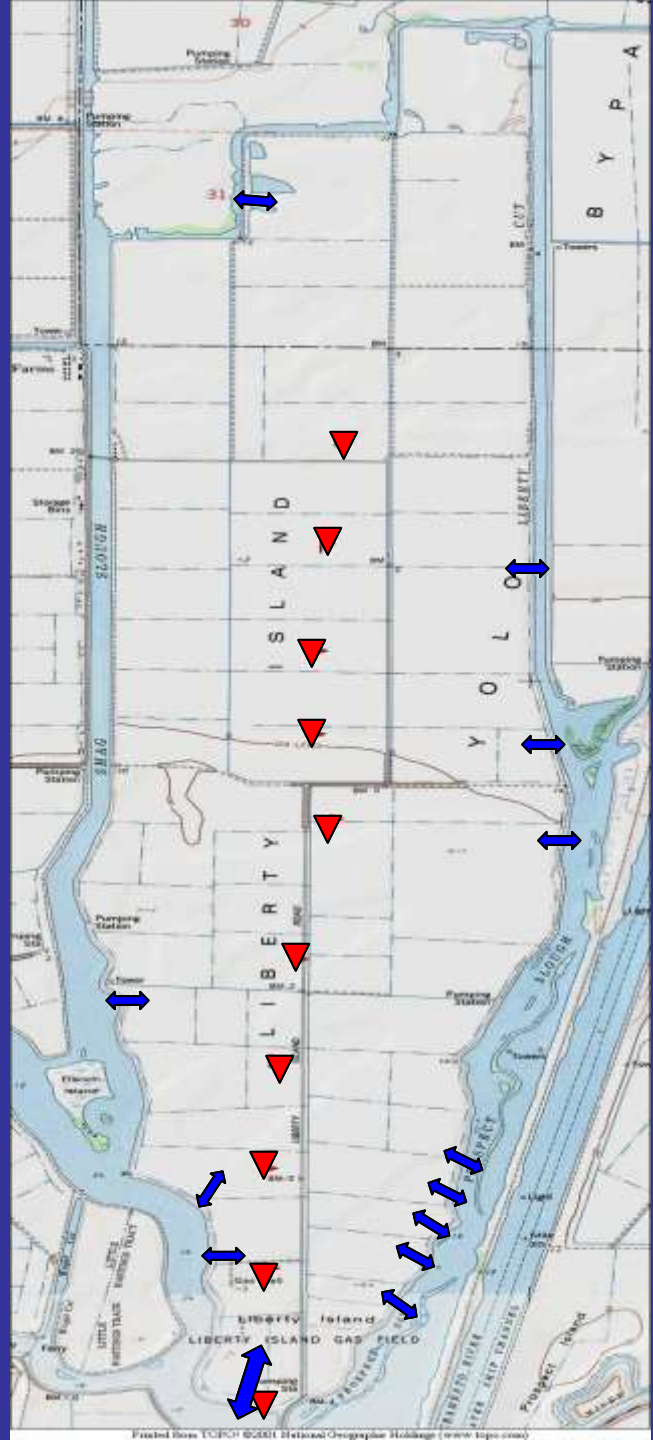




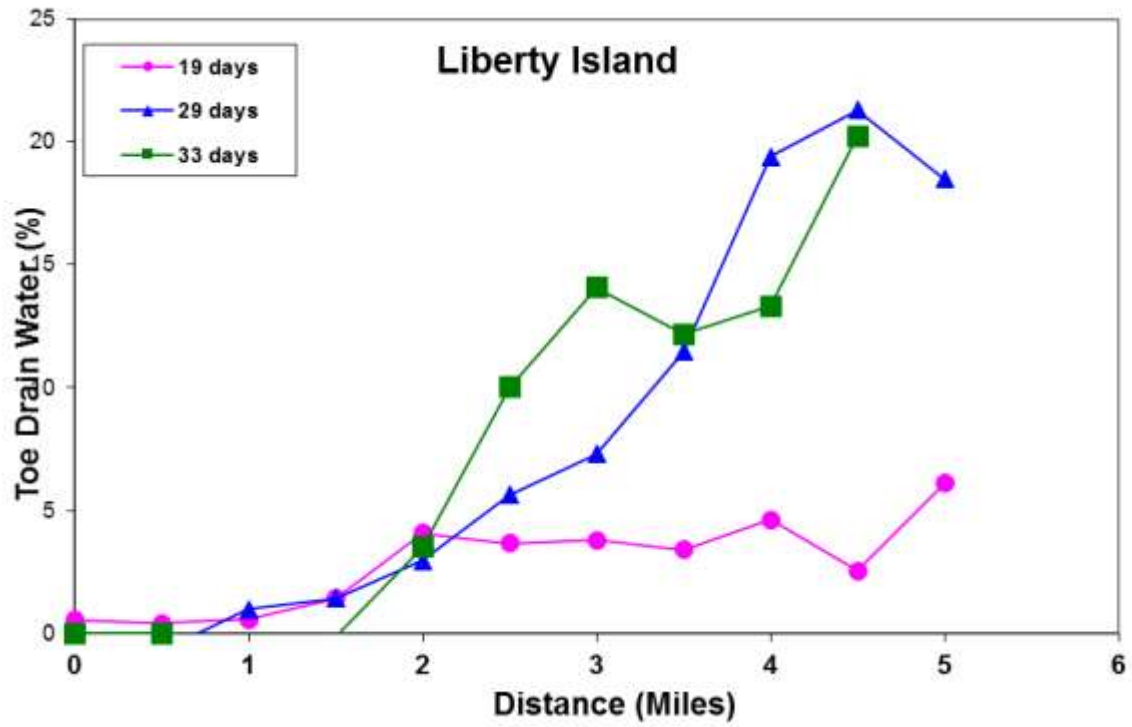




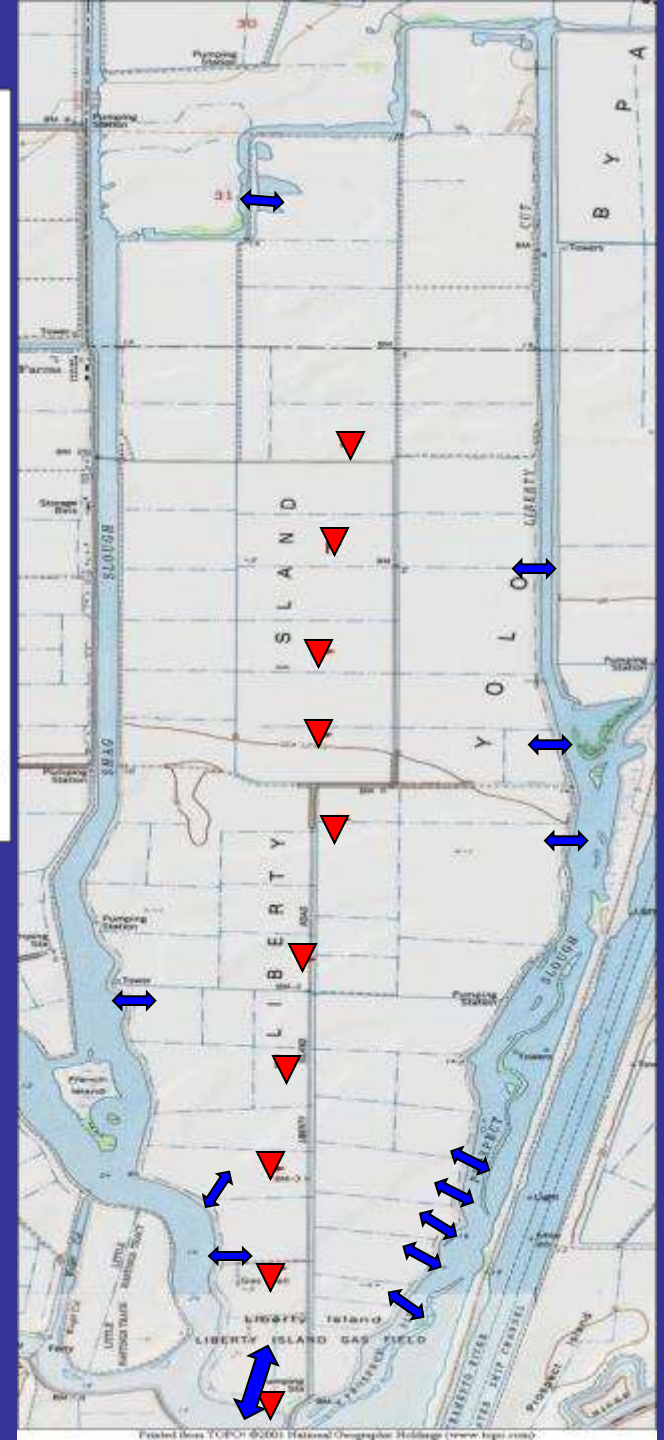
**Graph of EC traveling north from the USGS buoy up the middle of Liberty Island on a half mile sampling interval. Red triangles are sampling sites and blue arrows are the location of levee breaks**







**Percentage of Toe Drain water in Liberty Island.**



# Conclusions

- **No algal bloom in the fall of 2013.**
- **POTWs are the major source of DIN in Yolo Bypass.**
- **Algal growth is N-limited in channels in late summer.**
- **Algal growth is N-limited much of year in the northern half of Liberty Island.**
- **North Liberty Island water has long residence time.**
- **Wetlands are strong denitrifiers. More wetland restoration is predicted to reduce ambient N-concentrations, increase N-limitation and decrease pelagic primary production.**