

# Delta Fishes: Status and Management Update

## Delta Stewardship Council Meeting - April 2015



Interagency  
Ecological Program  
COOPERATIVE ECOLOGICAL  
INVESTIGATIONS SINCE 1970



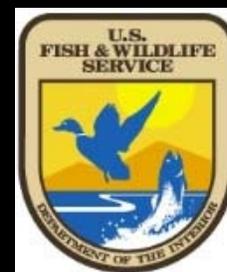
*Ted Sommer*  
Lead Scientist  
Department of Water Resources

# Drought Synthesis Team:

## *IEP-MAST & CDFW Drought Operation Plan Collaboration*



- Louise Conrad
- Kris Jones
- Sarah Lesmeister
- Ted Sommer
- Betsy Wells



- Gonzalo Castillo
- Steve Culberson
- Matthew Dekar
- Joseph Kirsch
- Susie Tharratt



- Patrick Coulston
- Michael Eakin
- Randy Baxter
- Chad Dibble
- Gregg Erickson
- Ken Kundargi
- Steve Slater



- Larry Brown



- James Hobbs



- Jason Hassrick
- Josh Israel

# Status of Winter Run Chinook Salmon

## Adults

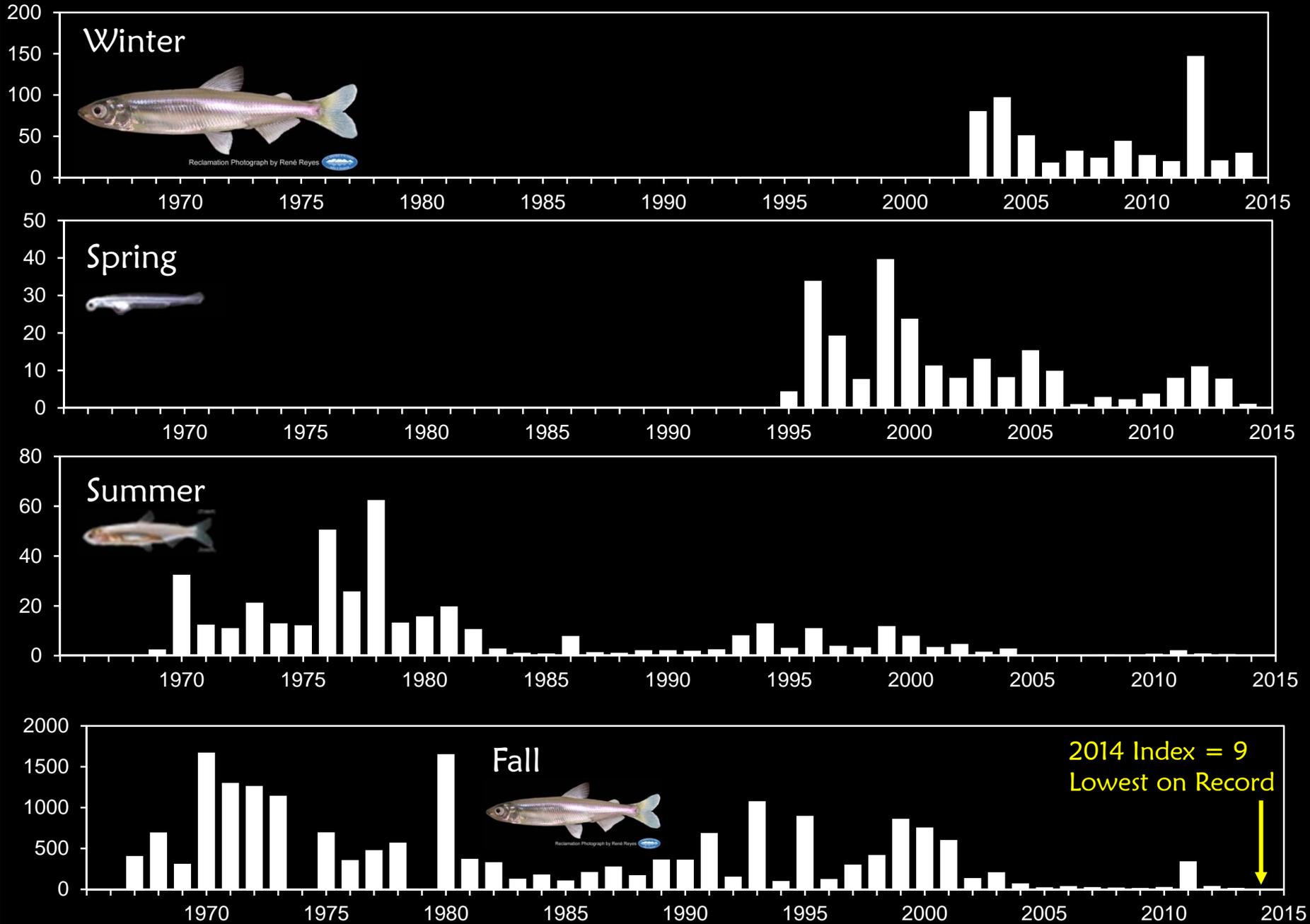
- Very low numbers in 2014.
  - ~3,000 Fish.
  - Poor (but not record low).



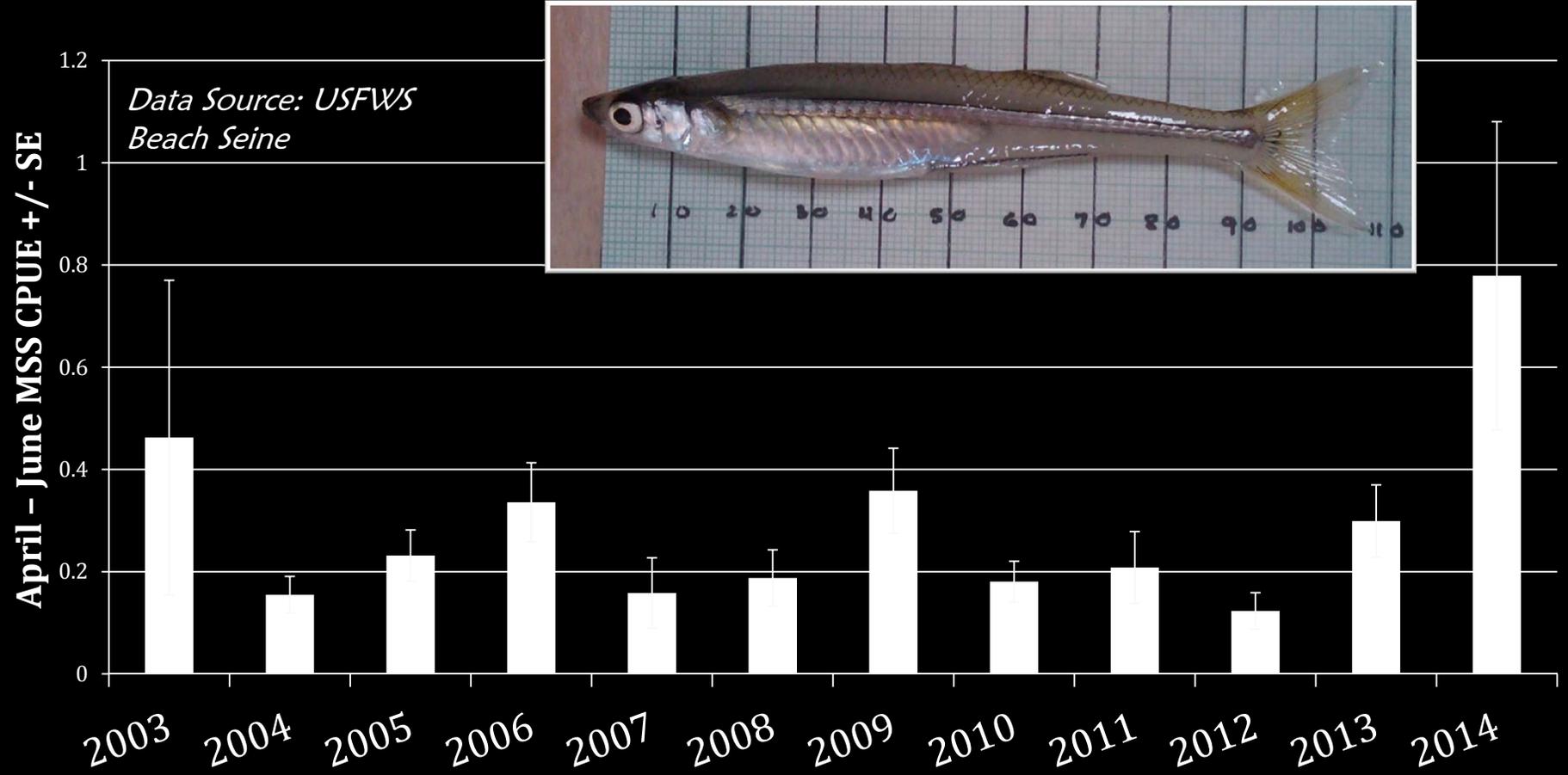
## Juveniles

- Major temperature problems in river.
- Extremely low numbers in 2015.
  - ~400,000 fish past Red Bluff Diversion Dam.
  - Only 25% expected to enter Delta.
- Low salvage of this size class in Delta.
  - Cumulative loss ~ 100 fish.
  - Successful protection or poor survival?

# Delta Smelt Abundance Indices at Historic Lows

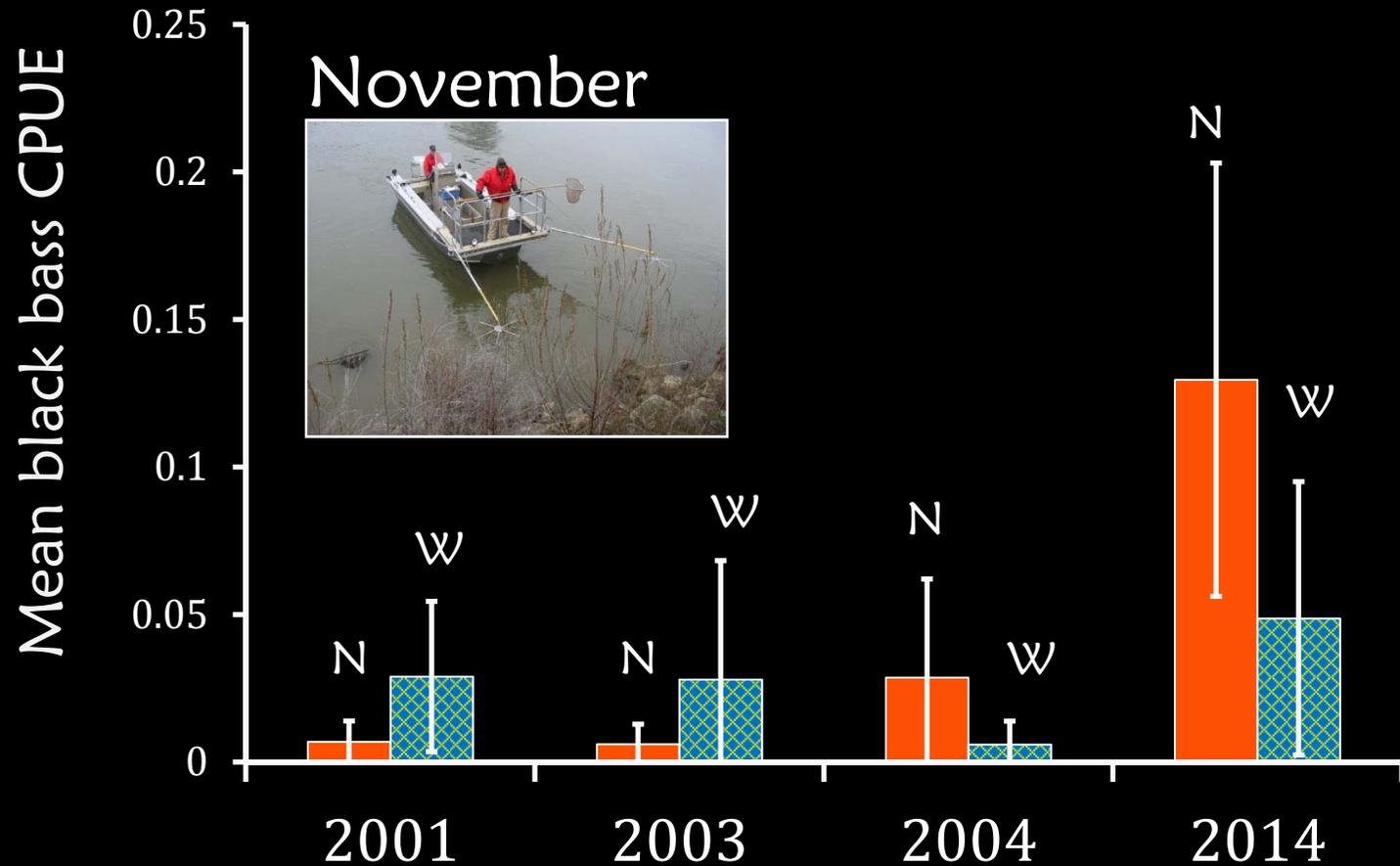


# Sharp Increase in Mississippi Silverside Abundance



Slide courtesy of Louise Conrad, DWR

# Black bass densities increased in 2014



Slide courtesy of Denise Barnard, FWS

# Delta Smelt Actions During Drought

## Sampling

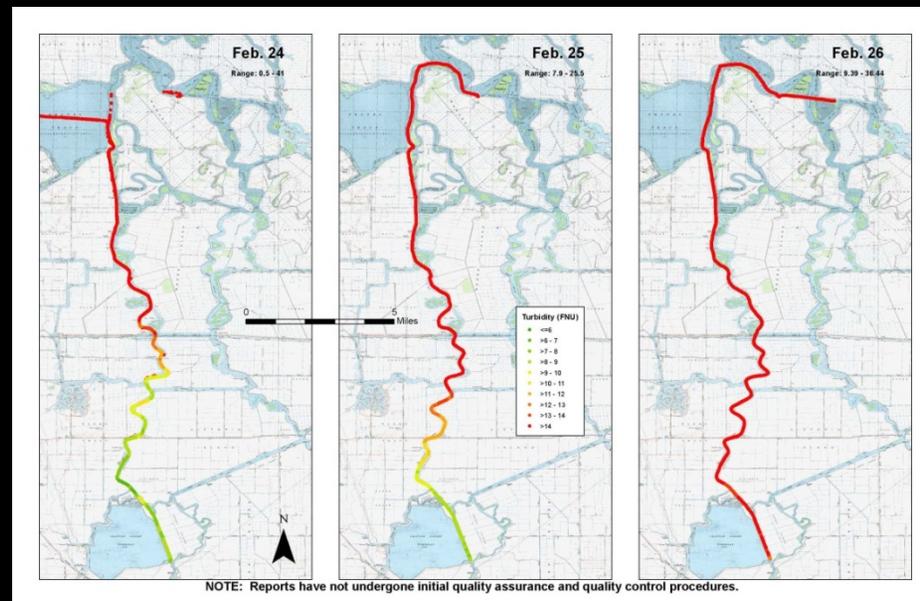
- Fisheries
  - Spring Kodiak Trawl in December.
  - High frequency Kodiak trawling at Jersey and Prisoner Points.



# Delta Smelt Actions During Drought

## Sampling

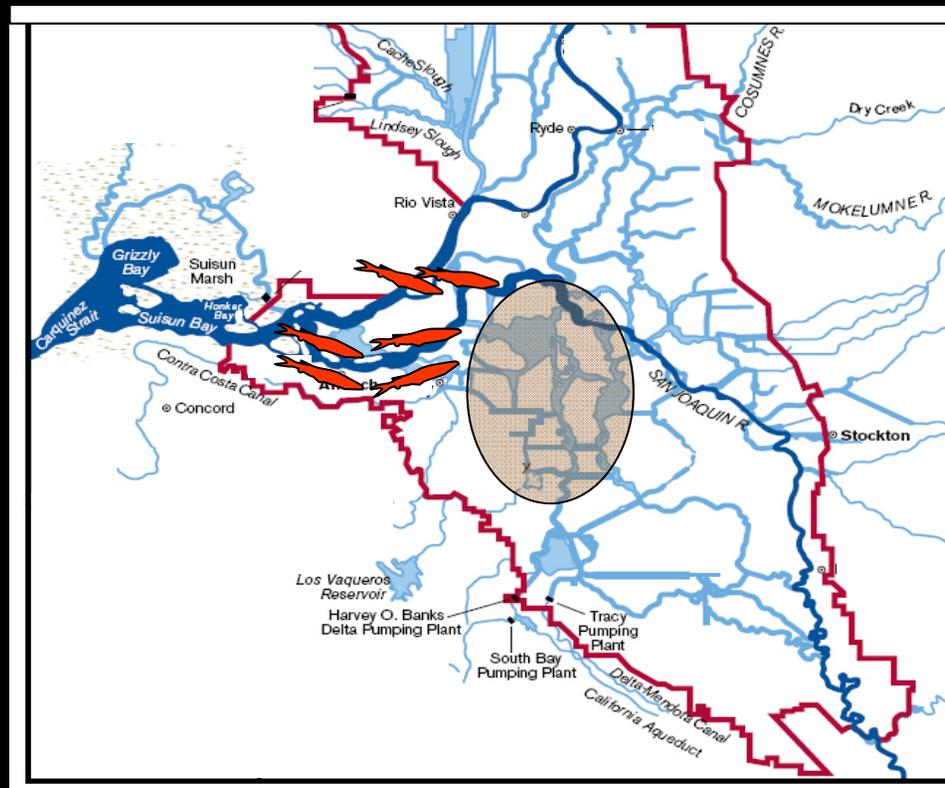
- Fisheries
  - Spring Kodiak Trawl in December.
  - High frequency Kodiak trawling at Jersey and Prisoner Points.
- Turbidity transects.



# Delta Smelt Actions During Drought

## Operational Changes

- Test management of turbidity field.
- Export reductions in winter to limit migration into South Delta.



# Salmon Actions During 2015 Drought

## Sampling

- High frequency Kodiak trawling at Jersey and Prisoner Points.
- Increased trawling and seining at Sacramento.
- Genetic testing of salmon.
- Tagged salmon releases.



# Salmon Protection Measures in 2015

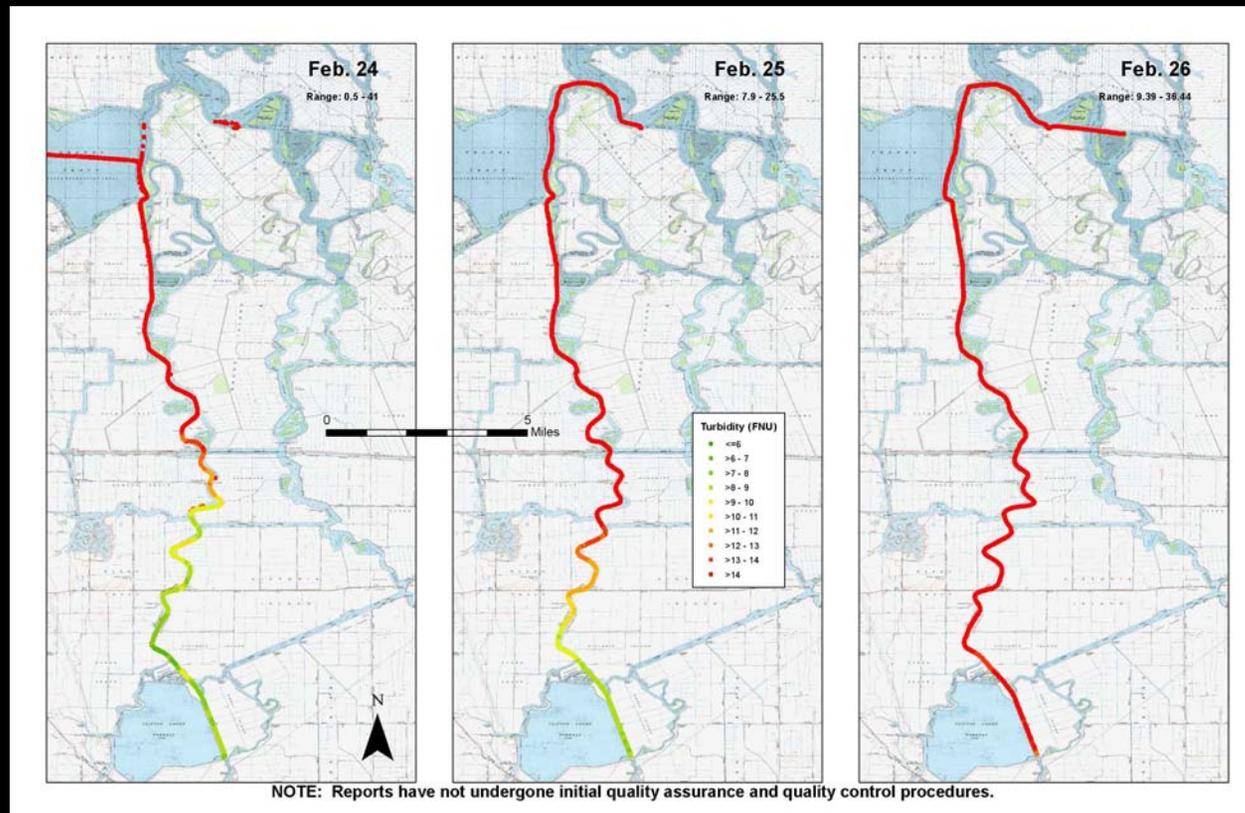
- Delta Cross Channel closures.
- Increased Winter-Run hatchery production.
- Trucking of juveniles to Rio Vista.
- Reduced exports after salmon density trigger met.



# Things to Consider Doing Differently in 2016

## Early Warning Sampling

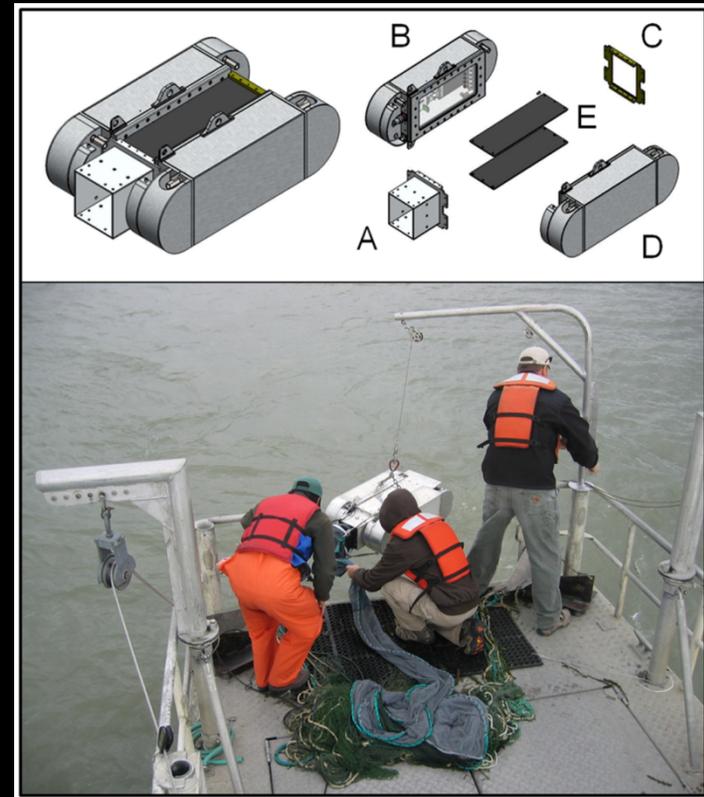
- Regular turbidity measurements.



# Things to Consider Doing Differently in 2016

## Early Warning Sampling

- Regular turbidity measurements.
- Reduced Kodiak trawling
  - More SmeltCam.
  - Environmental DNA Sampling?



Feyrer et al. (PLoSOne, 2013)

# Things to Consider Doing Differently in 2016

## *Early Warning Sampling*

- Regular turbidity measurements.
- Reduced Kodiak trawling
  - More SmeltCam.
  - Environmental DNA sampling?
- Increased genetic testing of salmon.





# Things to Consider Doing Differently in 2016

## *Management Actions*

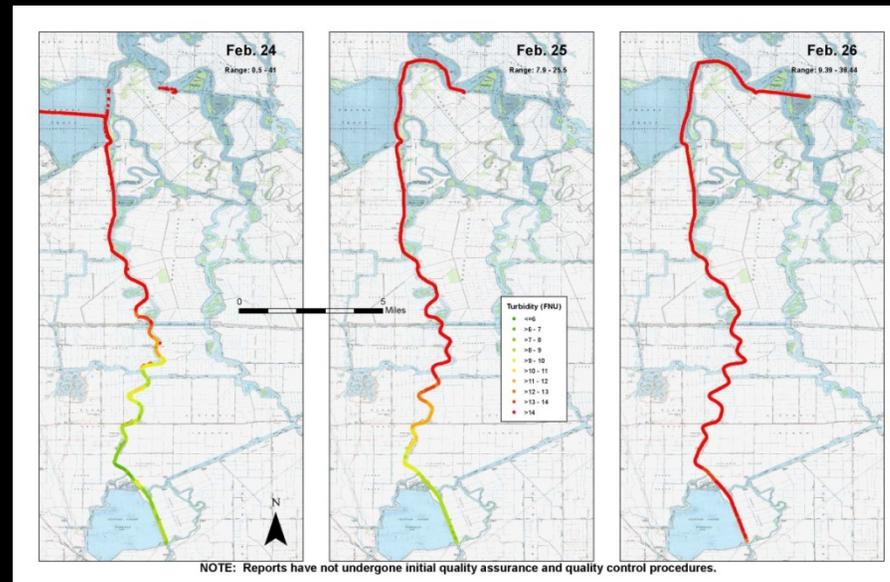
- Aquatic vegetation control is critical.
  - Creates predator habitat.
  - Acts like a filter for turbidity.
  - Causes poor efficiency and increased mortality at fish screens.



Photo: Roger Kelley for Bay Nature Magazine

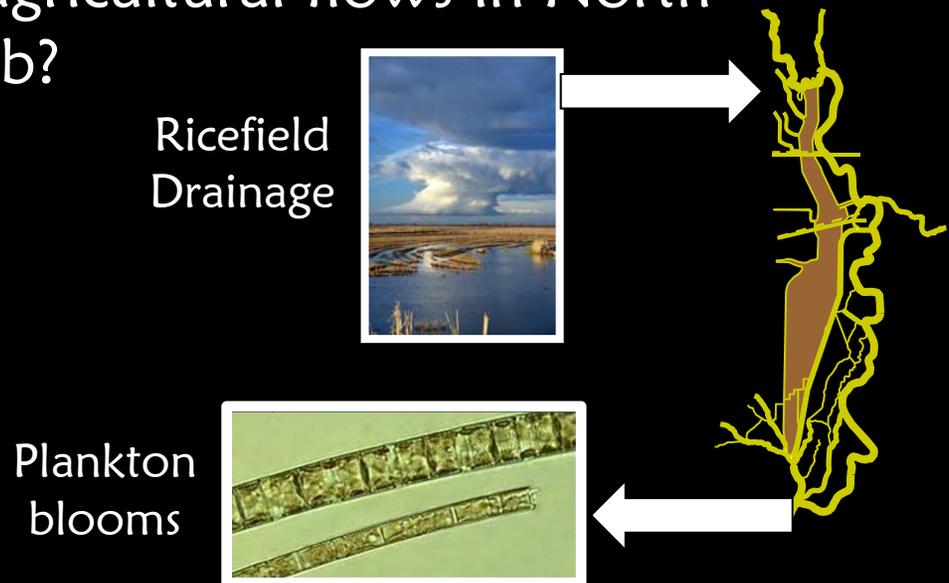
# Things to Consider Doing Differently in 2016 Management Actions

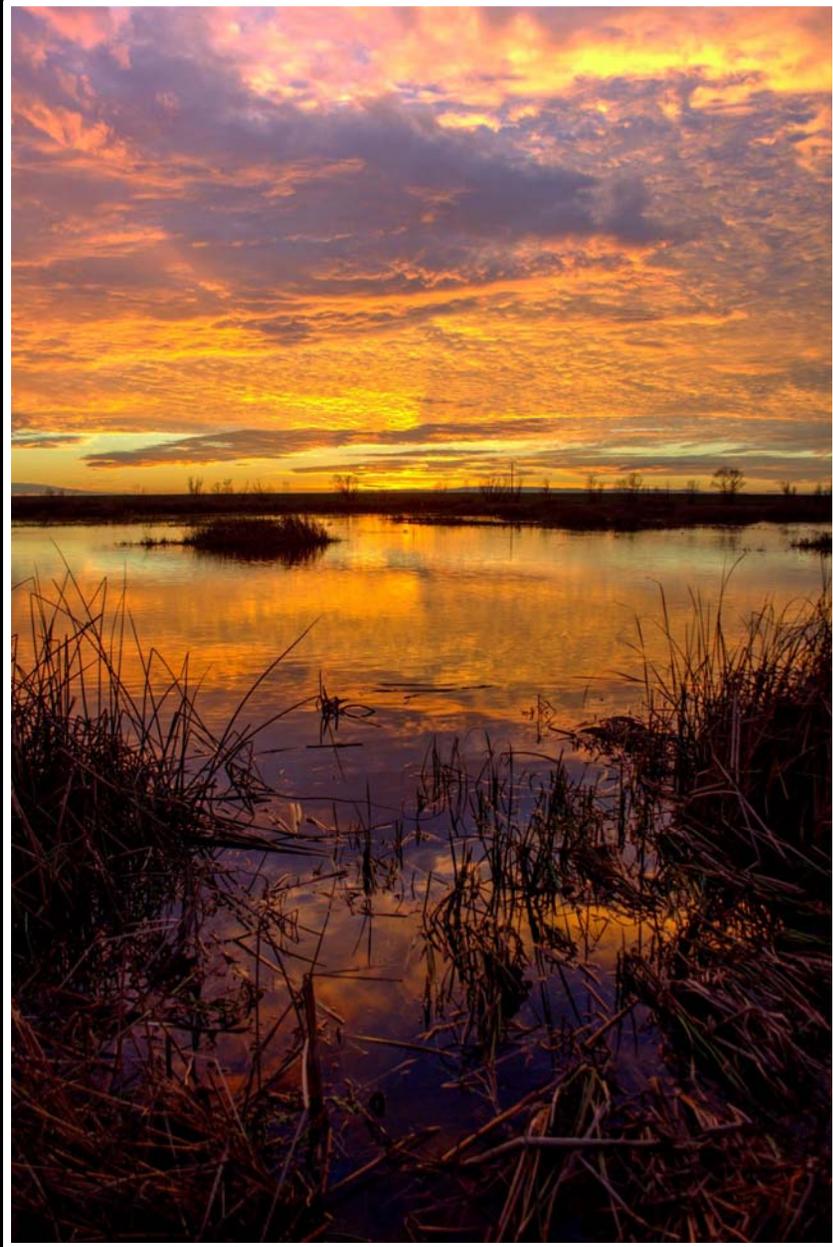
- Aquatic vegetation control is critical.
  - Creates predator habitat.
  - Acts like a filter for turbidity.
  - Causes poor efficiency and increased mortality at fish screens.
- More intensive turbidity management in Delta.



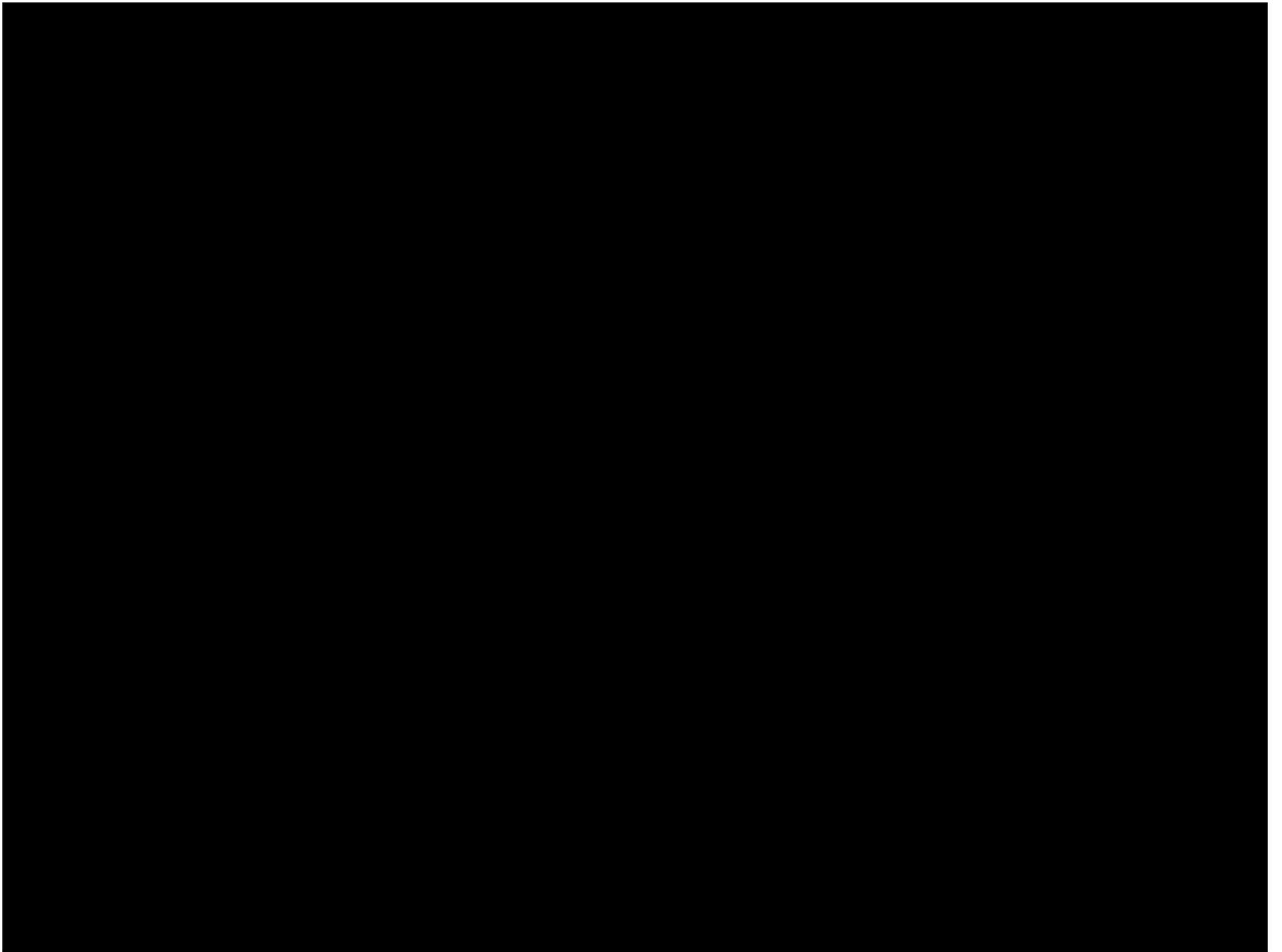
# Things to Consider Doing Differently in 2016 Management Actions

- Aquatic vegetation control is critical.
  - Creates predator habitat.
  - Acts like a filter for turbidity.
  - Causes poor efficiency and increased mortality at fish screens.
- More intensive turbidity management in Delta.
- Strategic use of fall 2015 agricultural flows in North Delta to support food web?

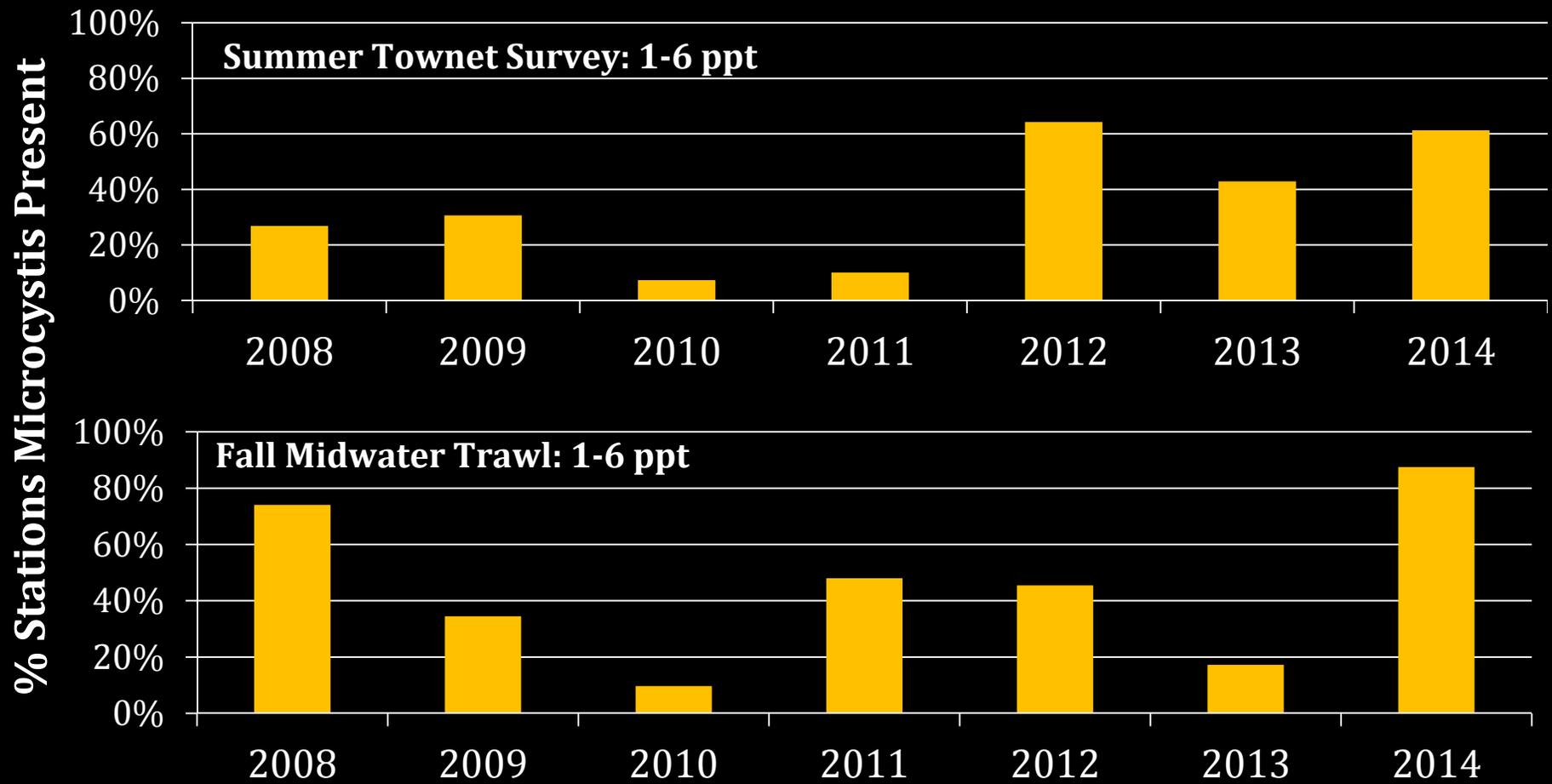




*Questions?*



# *Microcystis More Prevalent*



# Warmer Air Temperatures During Drought

Jan - Mar

Apr - Jun

July - Aug

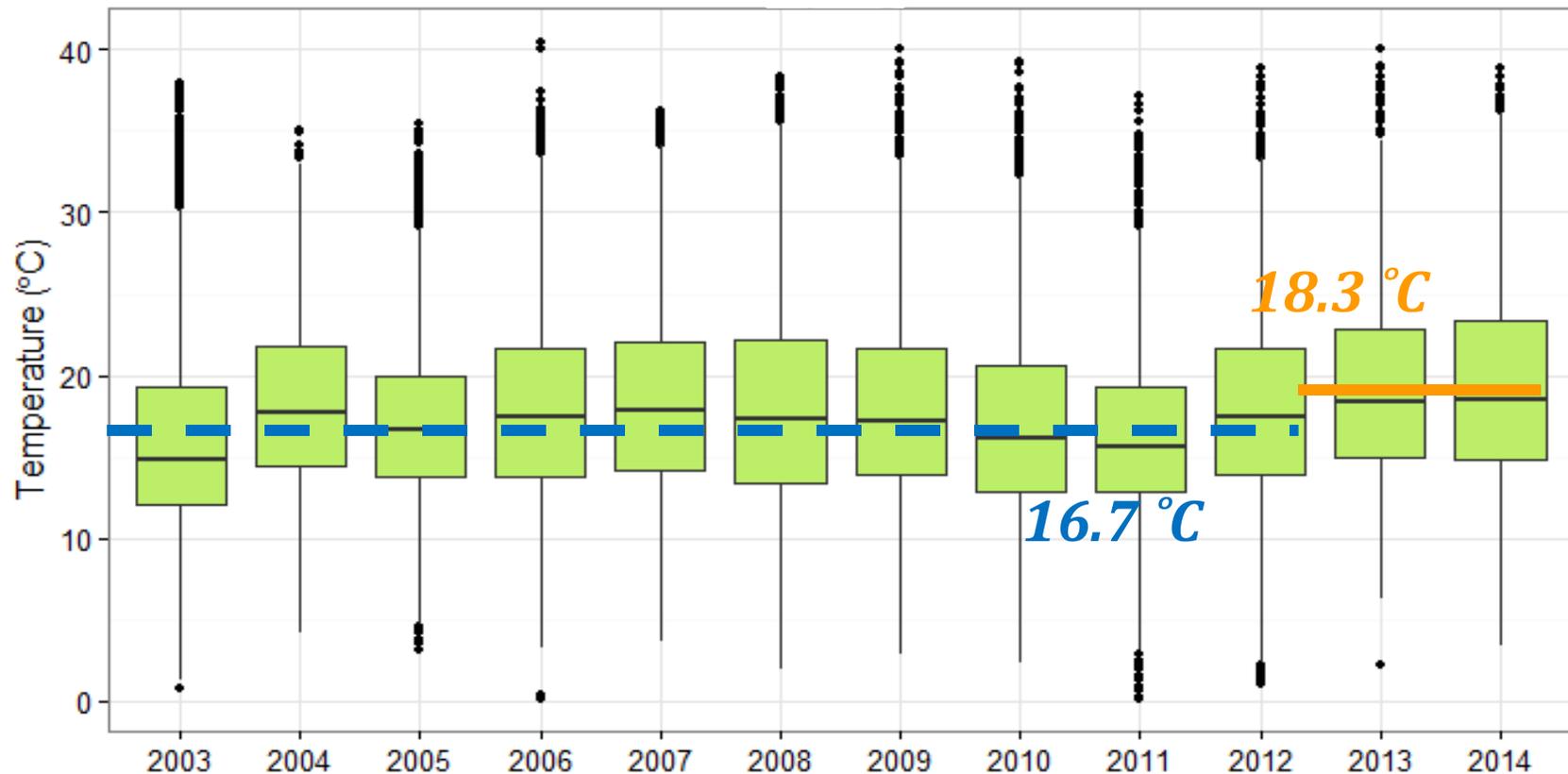
Sept - Dec

## Results

Air Temperature



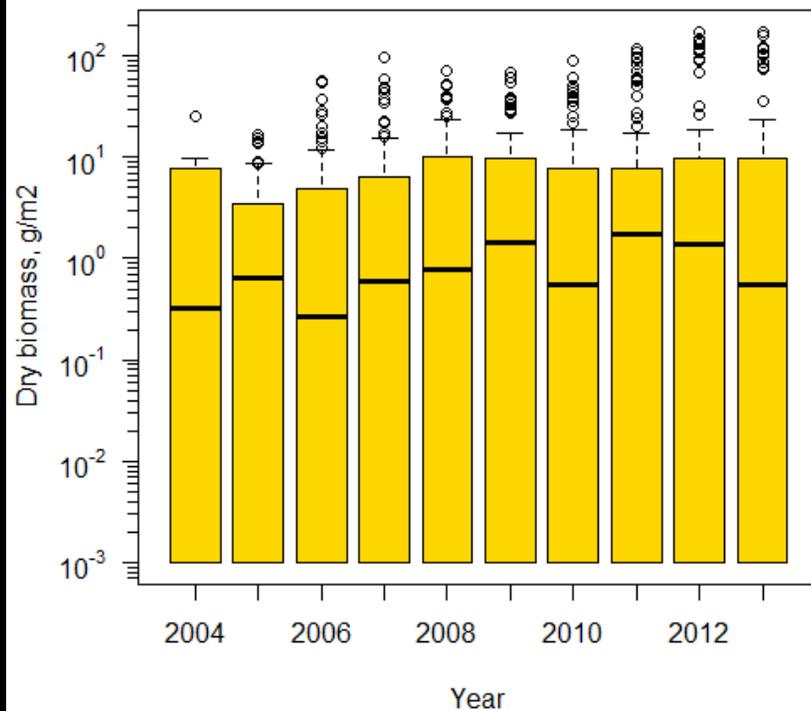
## April - June



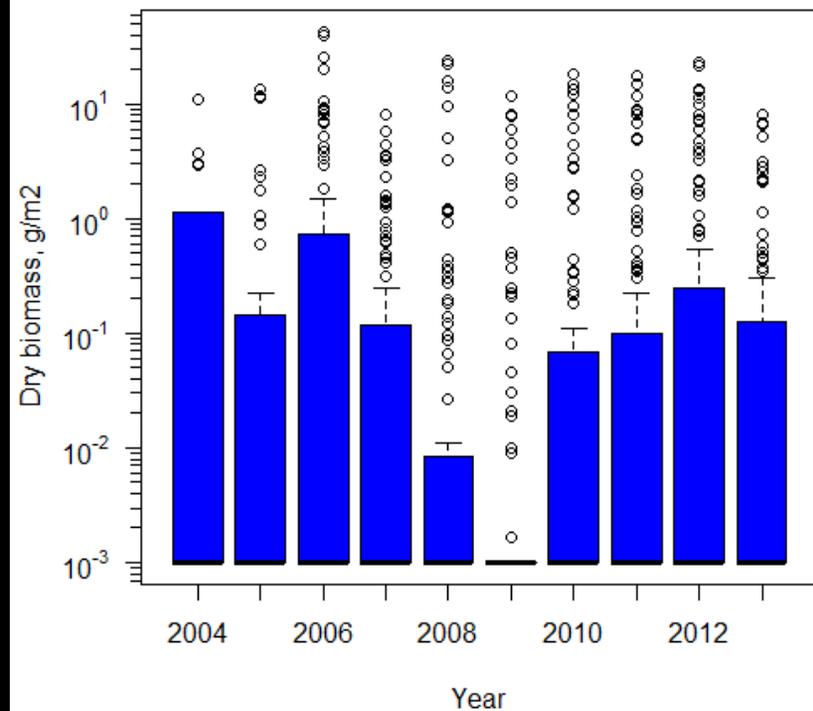
Air temperature station data pooled from: Lodi, Mossdale Bridge, Mallard, Rio Vista

# *No clear drought signal from invasive clams*

## ***Corbicula Biomass***



## ***Potamocorbula Biomass***



Environmental Monitoring Program Benthic Survey, 2004 - 2013

# Delta Smelt Distribution Leans Upstream

River Kilometer

