

# Top ~~Ten~~ Insights from the 2014 Delta Drought Modeling

Seven

Municipal Water Quality Investigations Annual Meeting  
July 30, 2014

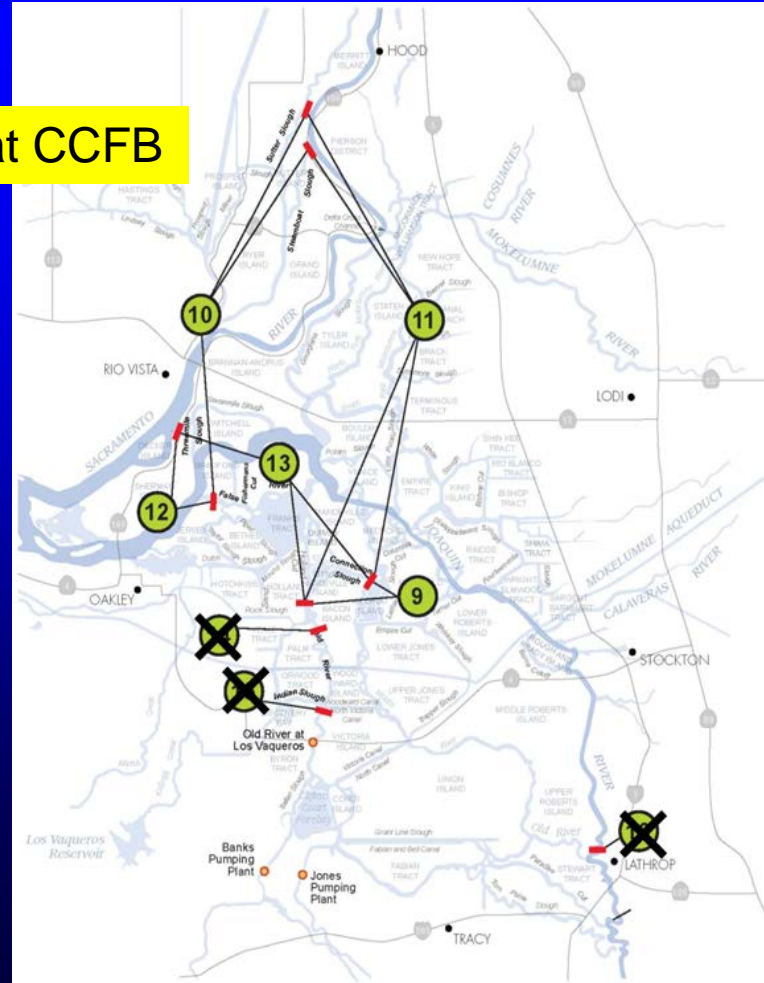
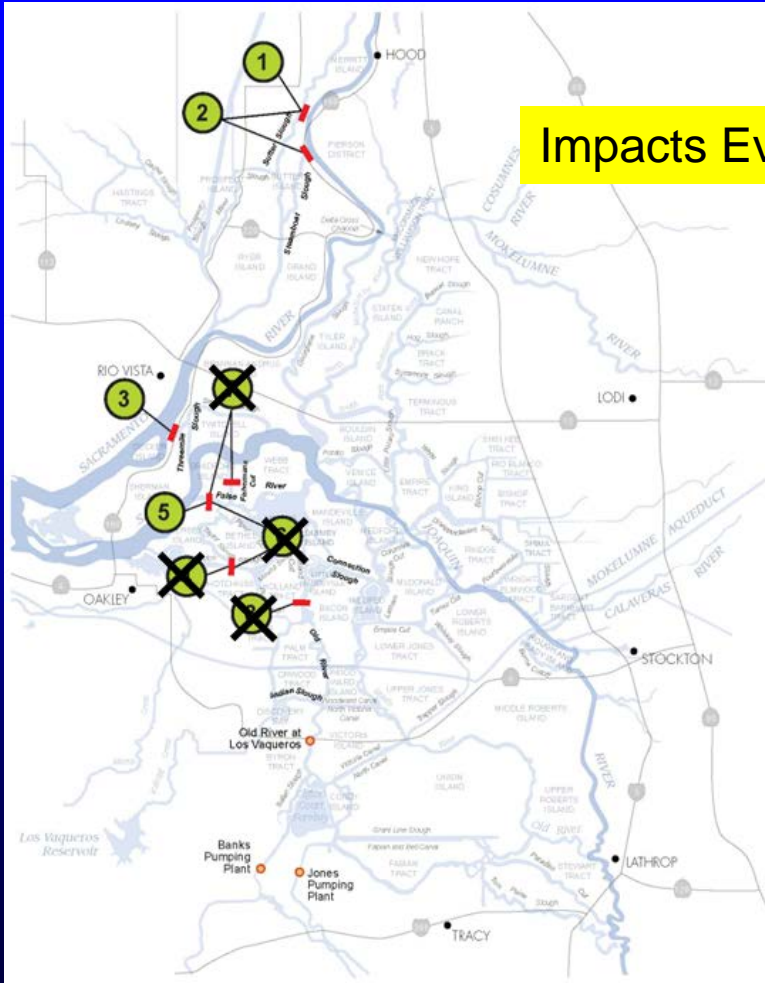
Tara Smith  
Chief , Delta Modeling Section



# 1

# Don't Throw Away the Old Studies!

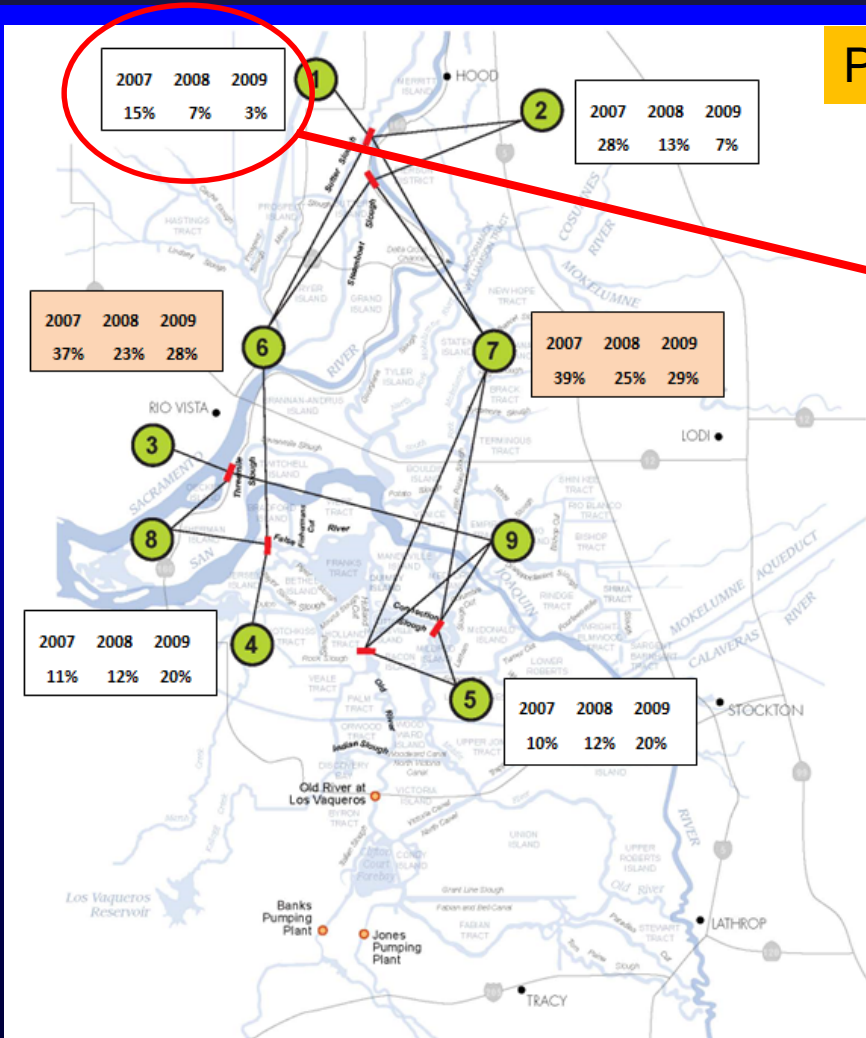
Impacts Evaluated at CCFB



# 1

# Don't Throw Away the Old Studies!

Percentage Salinity Improvement at CCFB

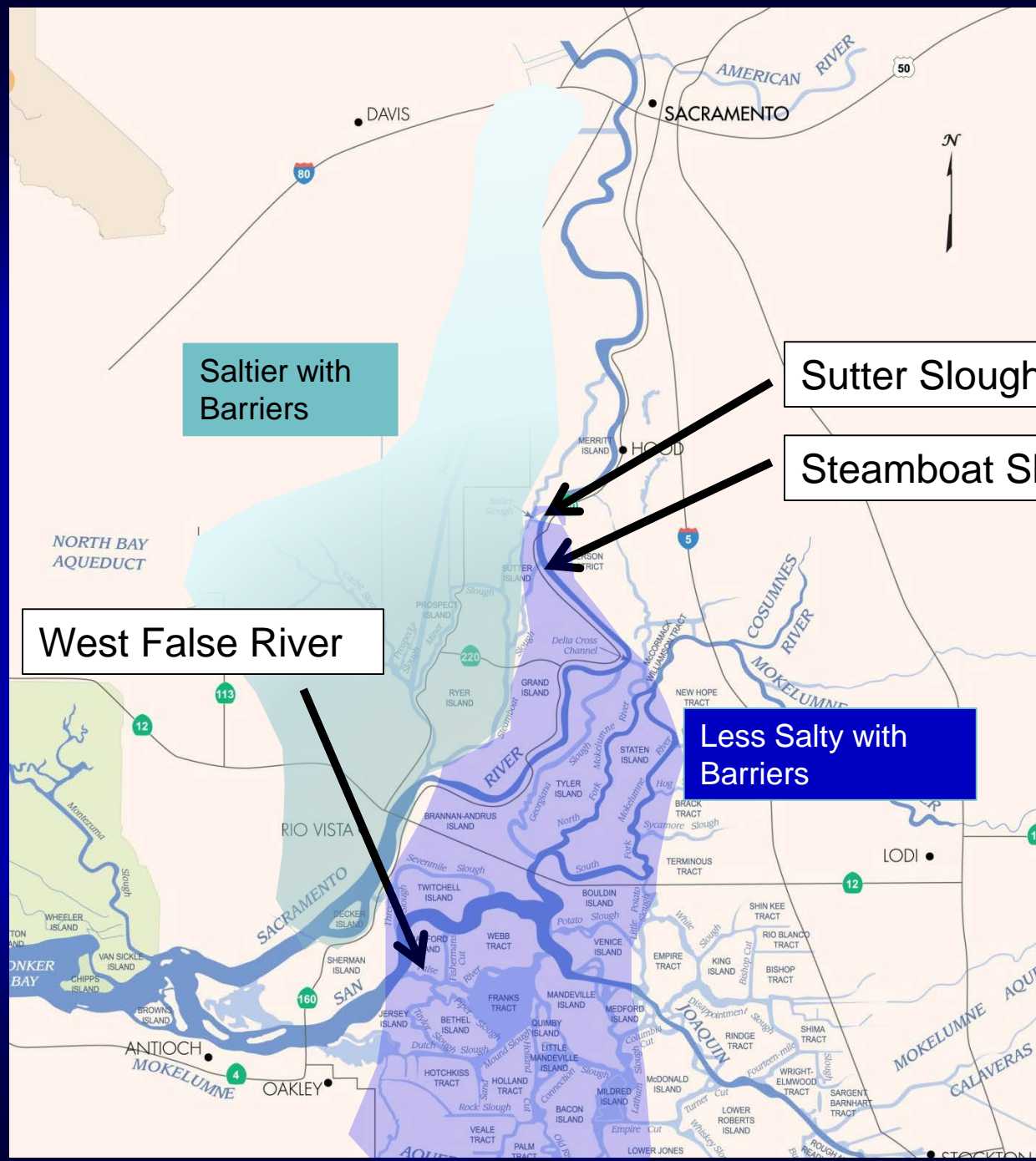


2007	2008	2009
15%	7%	3%

Checked Impacts with 2014 Forecast

1

# General Pattern of Salinity Impacts



Saltier with Barriers

Sutter Slough

Steamboat Slough

West False River

Less Salty with Barriers

## 2 Forecasts – Let Me Count the Ways



Modeling Forecasts Don't Predict the Future!

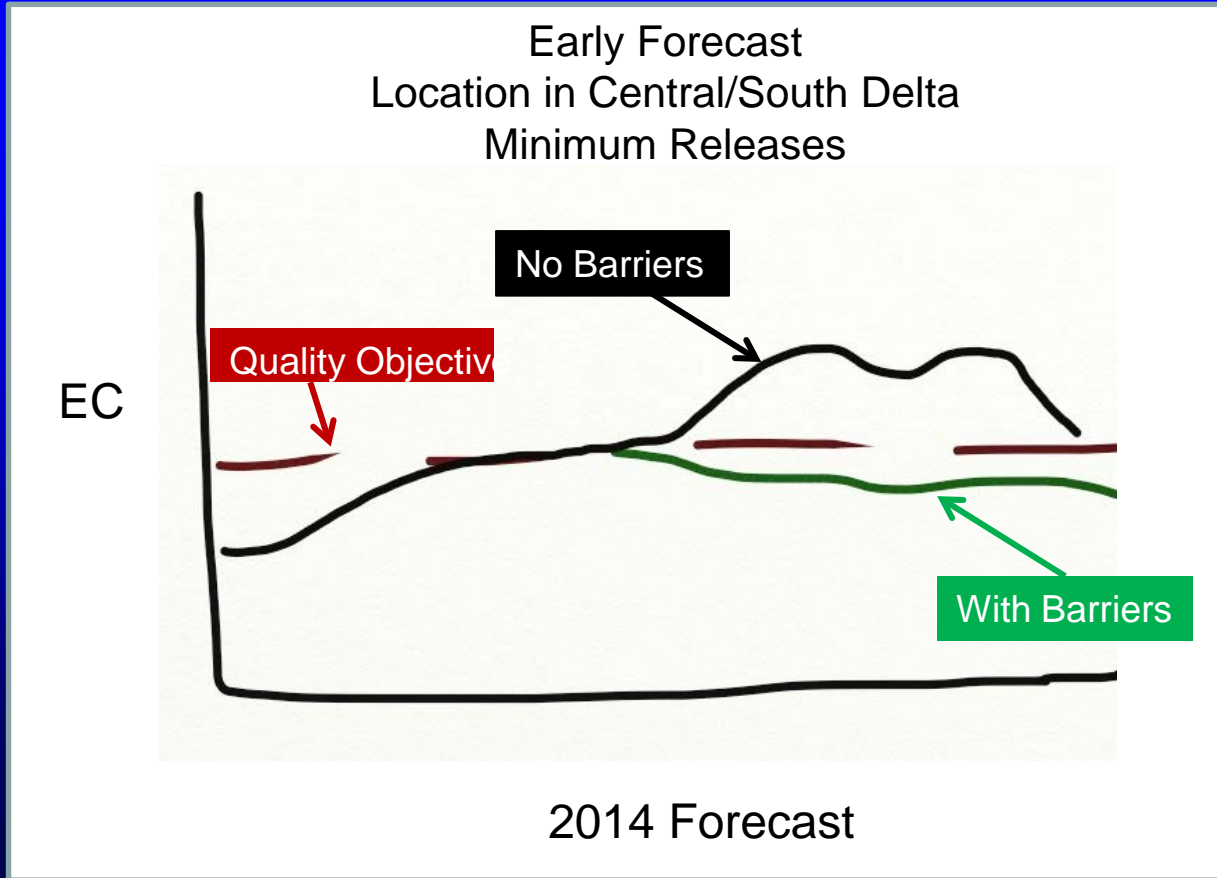
- Precipitation Changes
- Operations/Uses will vary

Review Results knowing the Assumptions in the Modeling Runs.

# 2

## Forecasts – Let Me Count the Ways

Minimum Releases

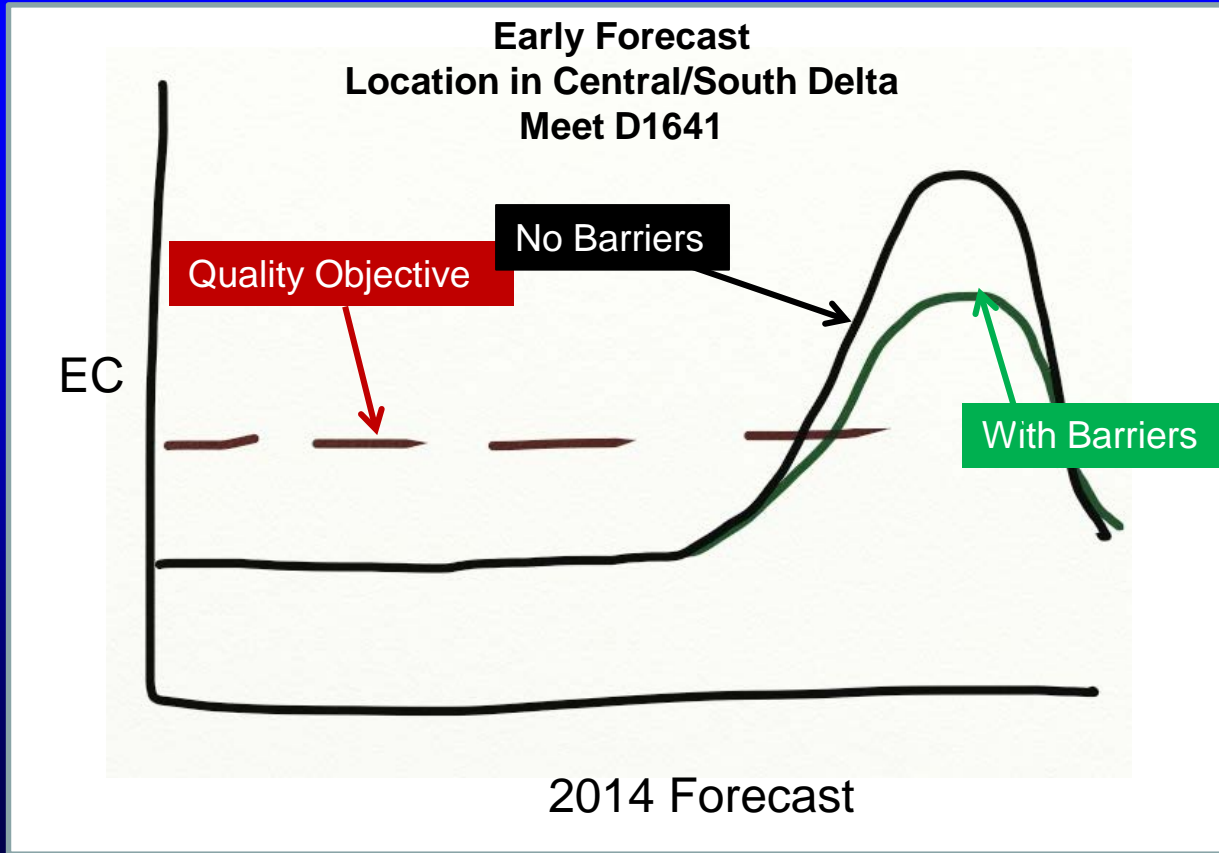


Minimum Releases – Release Storage over Time

# 2

## Forecasts – Let Me Count the Ways

Meet D-1641



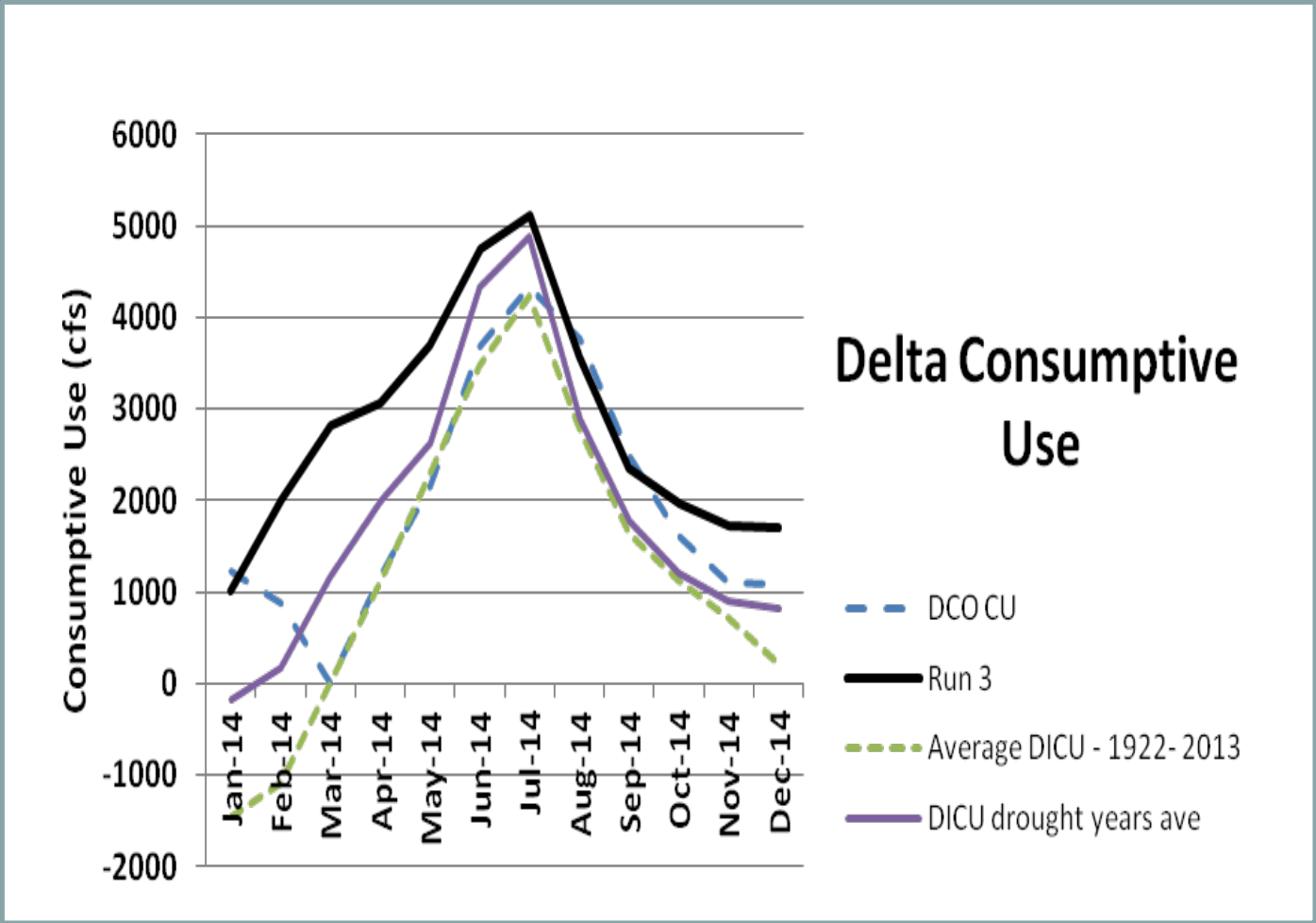
Meet WQ Objectives Until Run Out of Reservoir Storage

# 3

# Will the Real Consumptive Use Please Stand Up

## Delta Consumptive Use

- CU Has Large Impact in Drought
- Also Uncertainty





3

# Will the Real Consumptive Use Please Stand Up

## Simple Flow Balance Example

$$\begin{array}{rccccccc} \text{Inflows} & - & \text{Exports} & - & \text{In Delta Use} & = & \text{Net Delta Outflow Index} \\ 8500 & & - 1500 & & - 4500 & & = 2500 \end{array}$$

A Difference of 1000 cfs can have a huge impact on salinity intrusion

CU Matters!

## 4

## Yoga For Delta Models

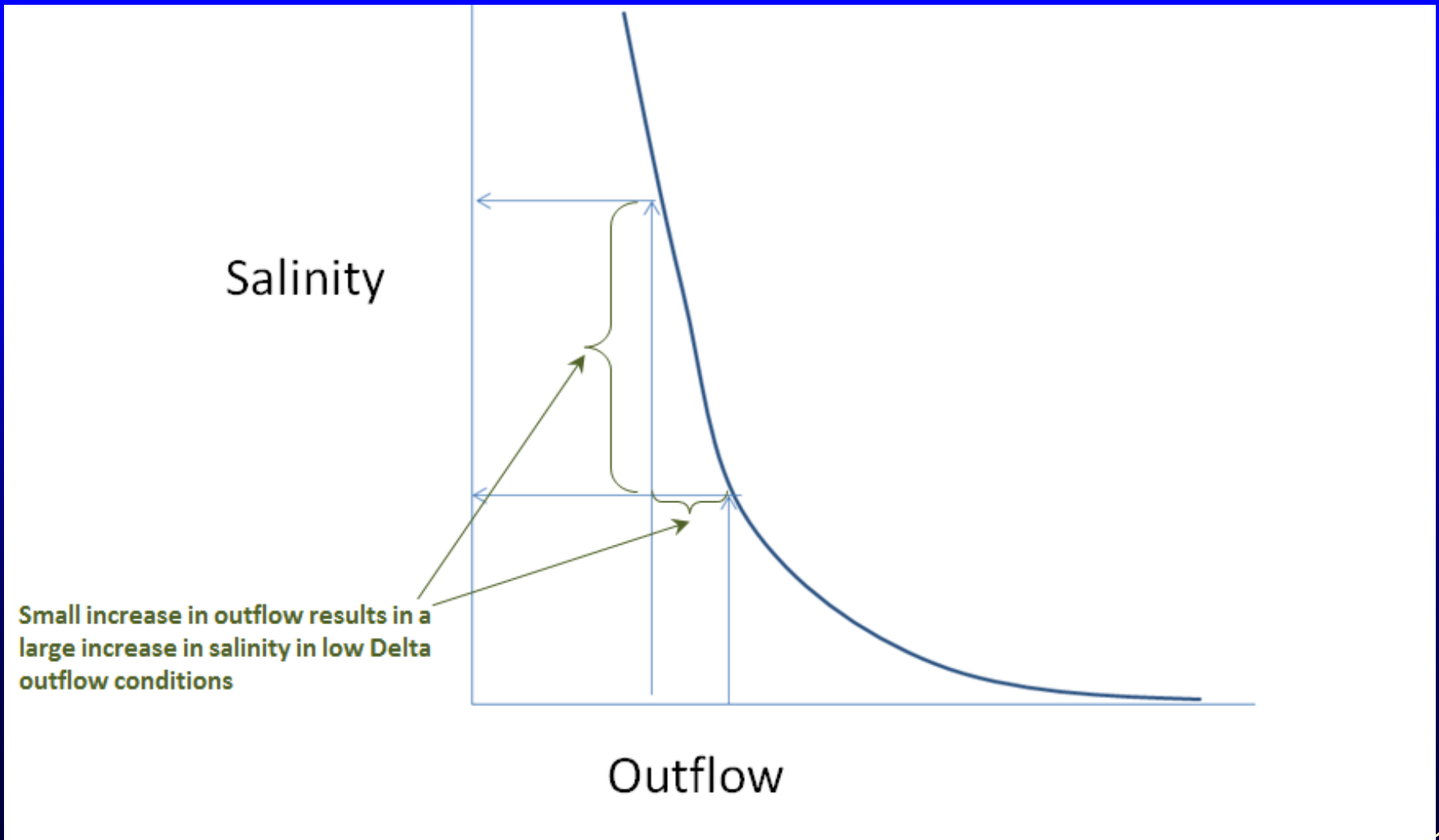


Models Not Calibrated for Extreme Drought – Outside of Historical Record



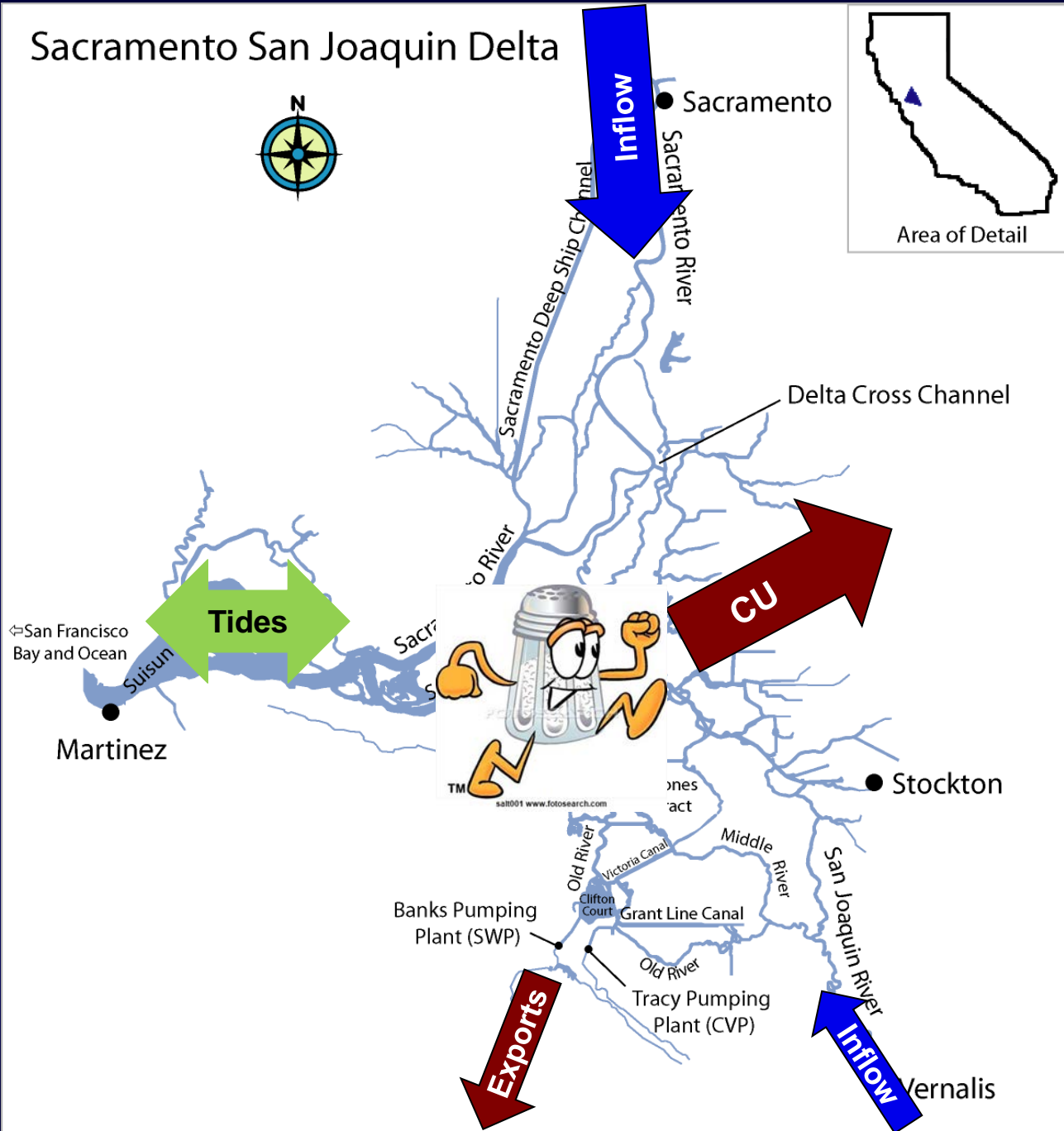
## 4

## Yoga For Delta Models



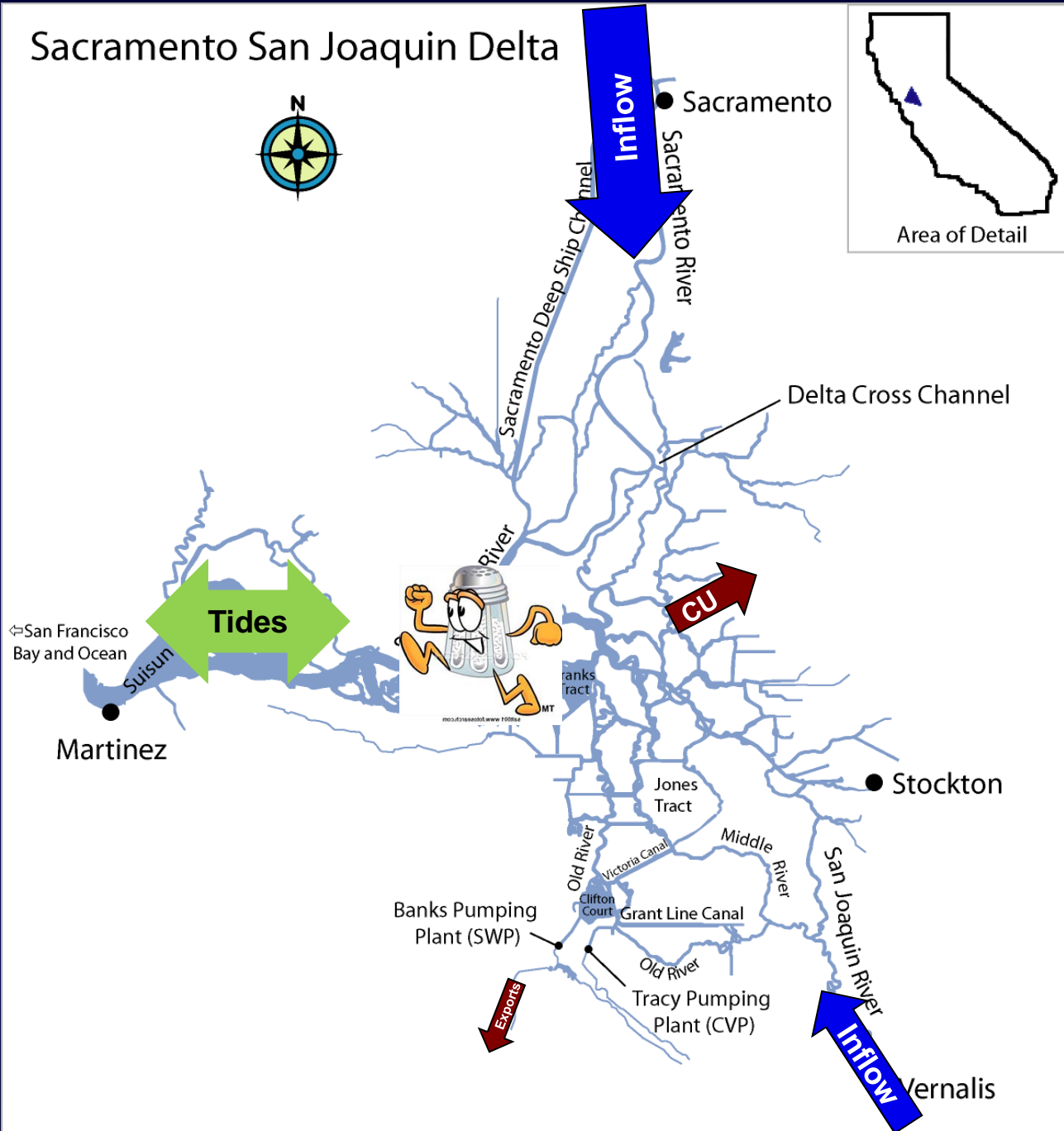
5

# Sacramento San Joaquin Delta



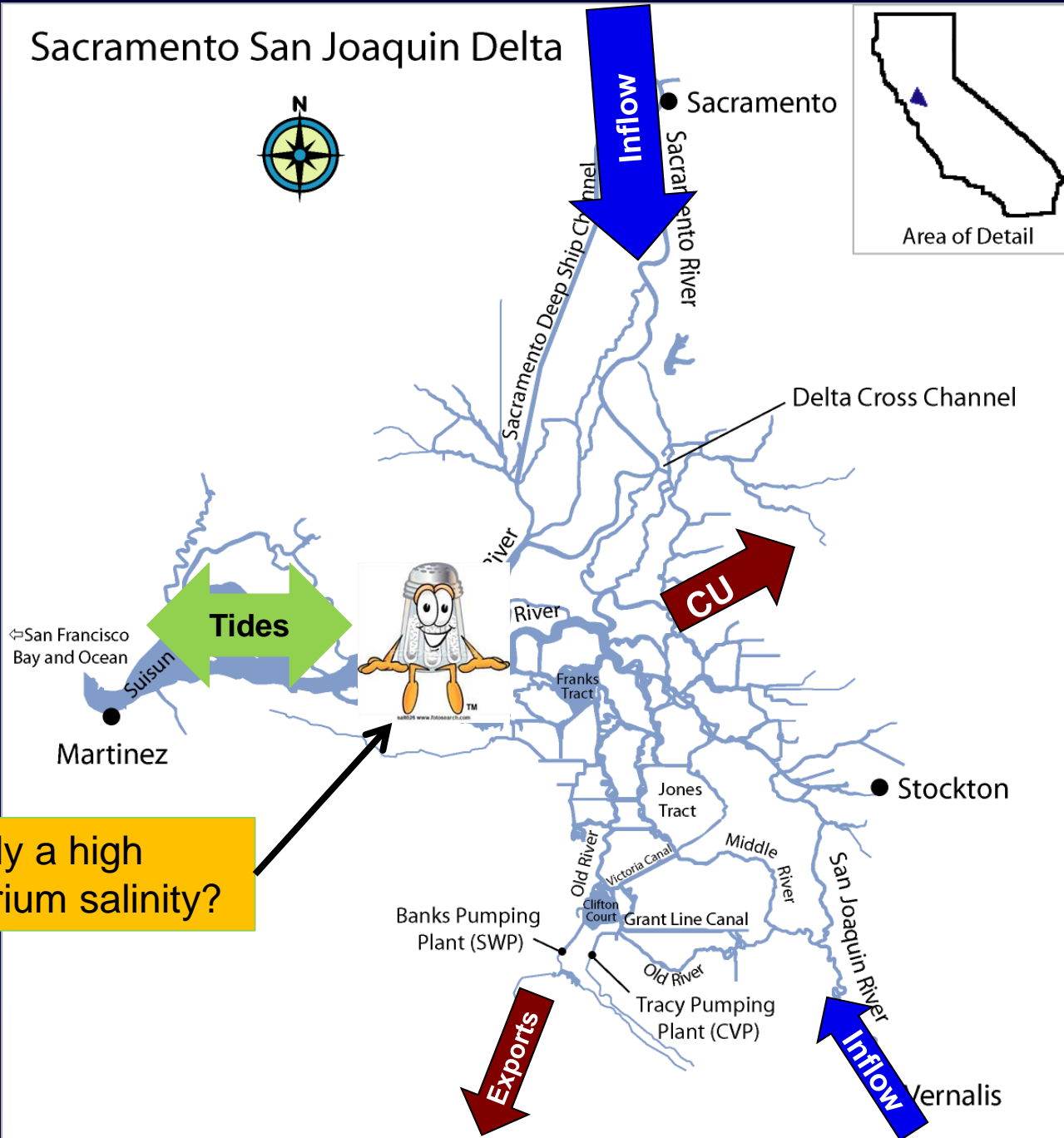
5

# Sacramento San Joaquin Delta



5

# Sacramento San Joaquin Delta



Possibly a high equilibrium salinity?

## 6

# It's Not Just Salinity

- Fish Spawning and Migration
- Water Levels Near Barrier Sites
- Bromide and Organic Carbon
- Velocities

**Lots of Model Output to Analyze**

7

# Quality Versus Quantity

## Net Delta Outflow Needed to Meet D-1641 Objectives for Various Alternatives

Objective	Without Emergency Barriers	Emergency Barriers	NDO Difference(positive indicates water savings with barriers)
Emmaton	3657 cfs	3893 cfs	-236 cfs
Relaxed	3045 cfs	2769 cfs	<p>If you meet all D1641 Objectives – Including Emmaton – There is a water cost with the barriers</p>
NDO Difference (positive indicates water savings with relaxed objectives)	612 cfs	1124 cfs	



7

# Quality Versus Quantity

## Net Delta Outflow Needed to Meet D-1641 Objectives for Various Alternatives

Objective	Without Emergency Barriers	Emergency Barriers	NDO Difference(positive indicates water savings with barriers)
Emmaton	3657 cfs	3893 cfs	-236 cfs
Relaxed	3045 cfs	2769 cfs	276 cfs
NDO Difference (positive indicates water savings with relaxed objectives)	612 cfs	1124 cfs	



If you relax the Emmaton objective and keep the barriers, there is a water savings

7

# Quality Versus Quantity

## Net Delta Outflow Needed to Meet D-1641 Objectives for Various Alternatives

Objective	Without Emergency Barriers	Emergency Barriers	NDO Difference(positive indicates water savings with barriers)
Emmaton	3657 cfs	3893 cfs	-236 cfs
Relaxed	3045 cfs	2769 cfs	276 cfs
NDO Difference (positive indicates water savings with relaxed objectives)	612 cfs	<p>If you relax the Emmaton objective with no barriers there is a water savings. However, water quality degrades at the export locations</p>	

