

Top ~~Ten~~ Insights from the 2014 Delta ^{IL_30} Drought Modeling

Seven

Municipal Water Quality Investigations Annual Meeting
July 30, 2014

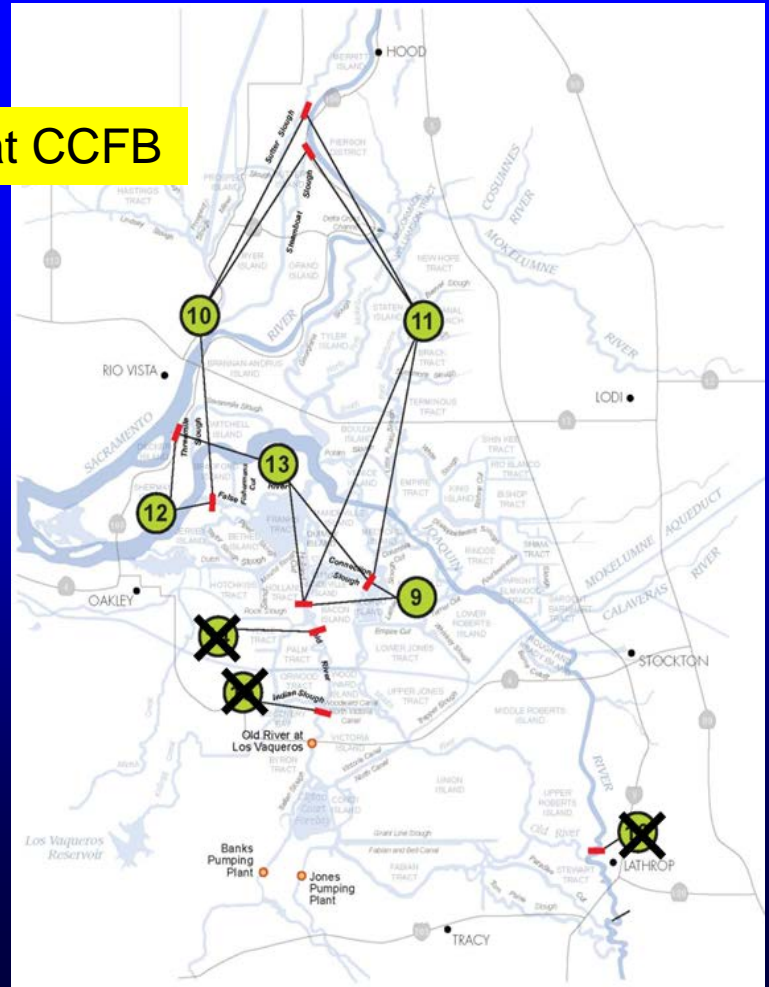
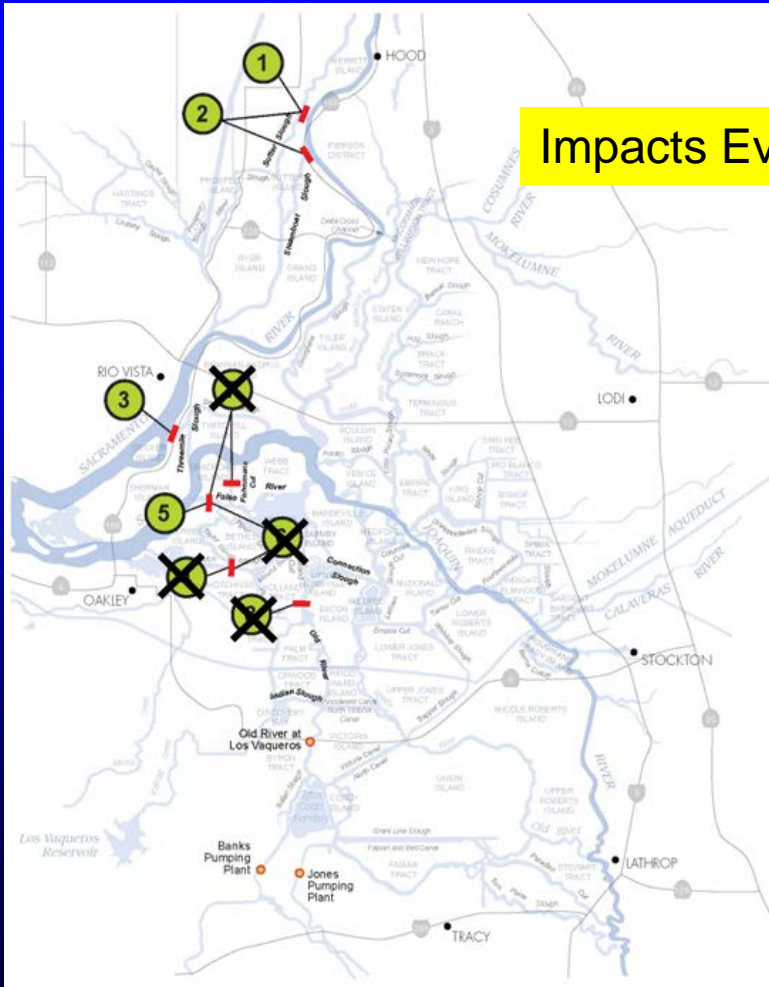
Tara Smith
Chief , Delta Modeling Section



1

Don't Throw Away the Old Studies!

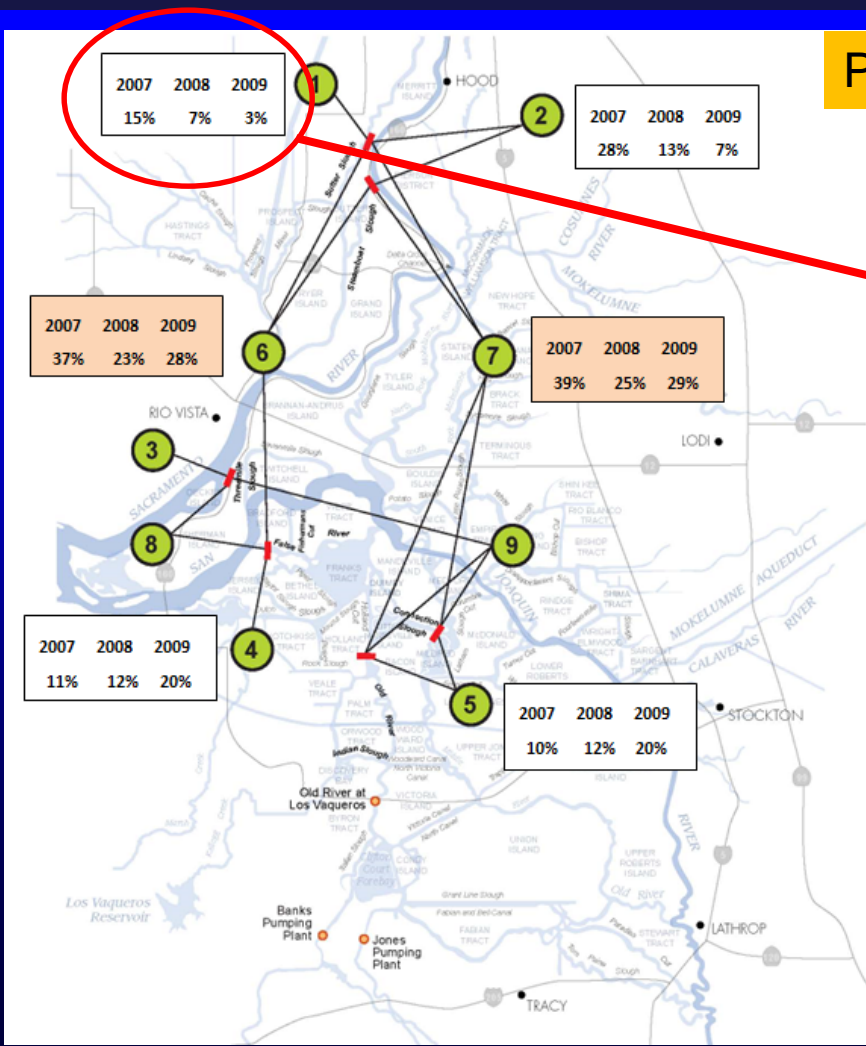
Impacts Evaluated at CCFB



1

Don't Throw Away the Old Studies!

Percentage Salinity Improvement at CCFB

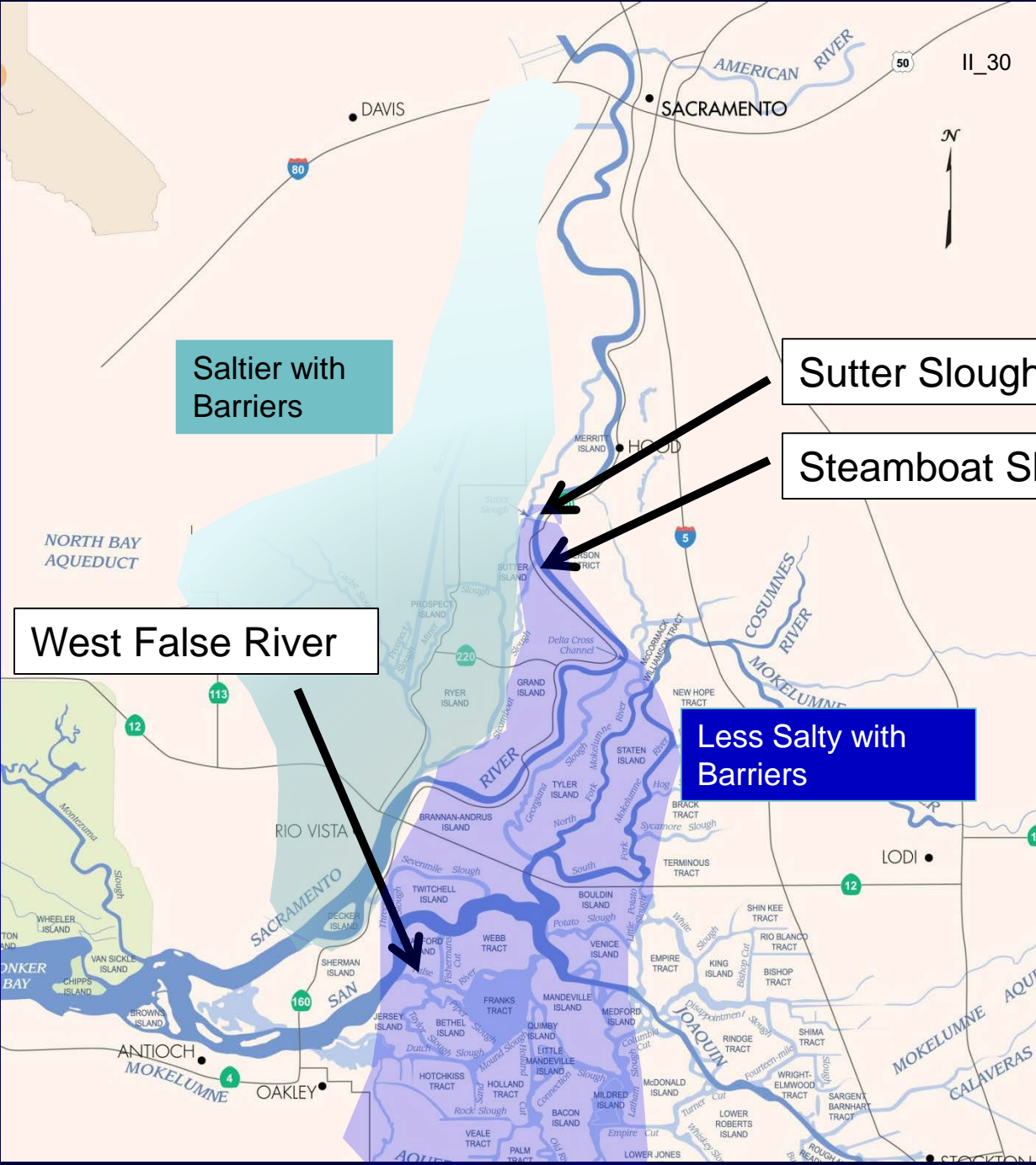


| 2007 | 2008 | 2009 |
|------|------|------|
| 15% | 7% | 3% |

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!

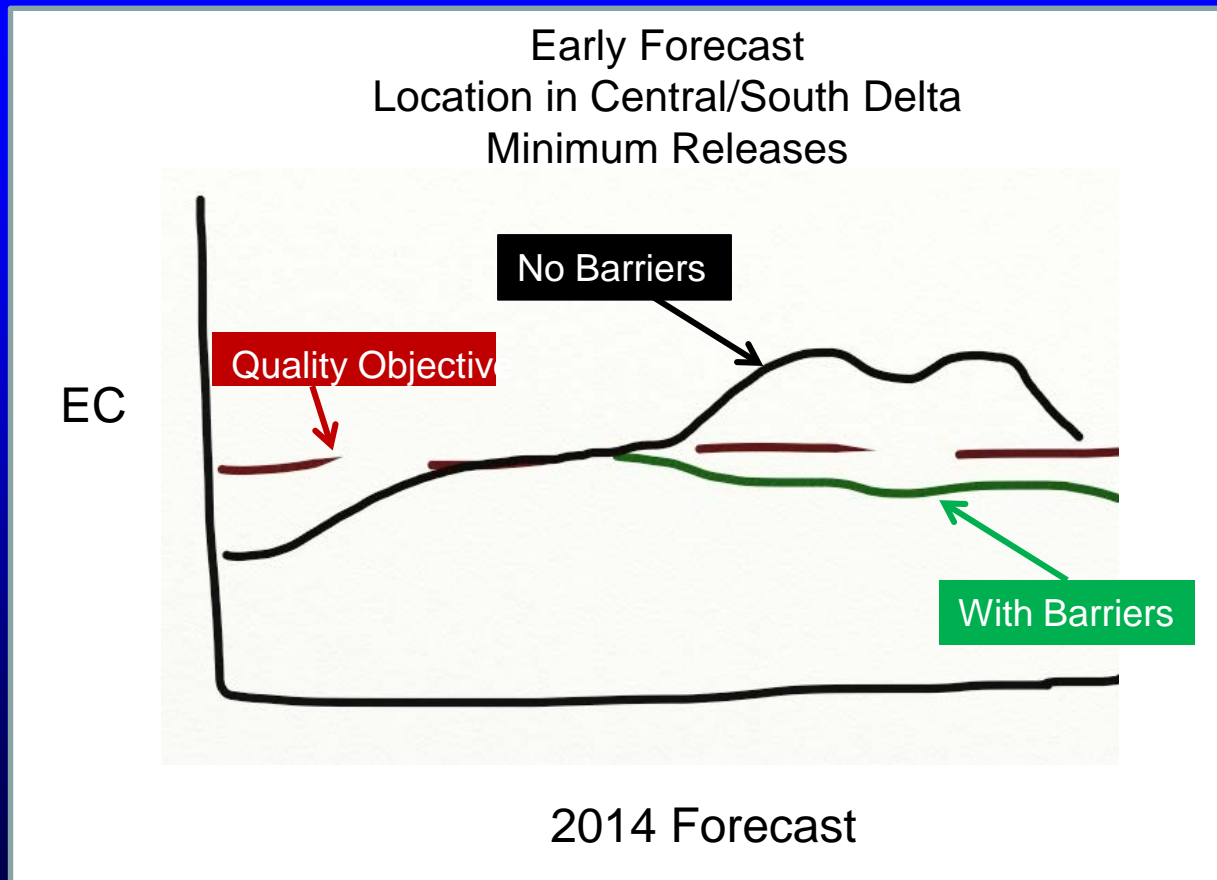
- Precipitation Changes
- Operations/Uses will vary

Review Results knowing the Assumptions in the Modeling Runs.

2

Forecasts – Let Me Count the Ways

Minimum Releases

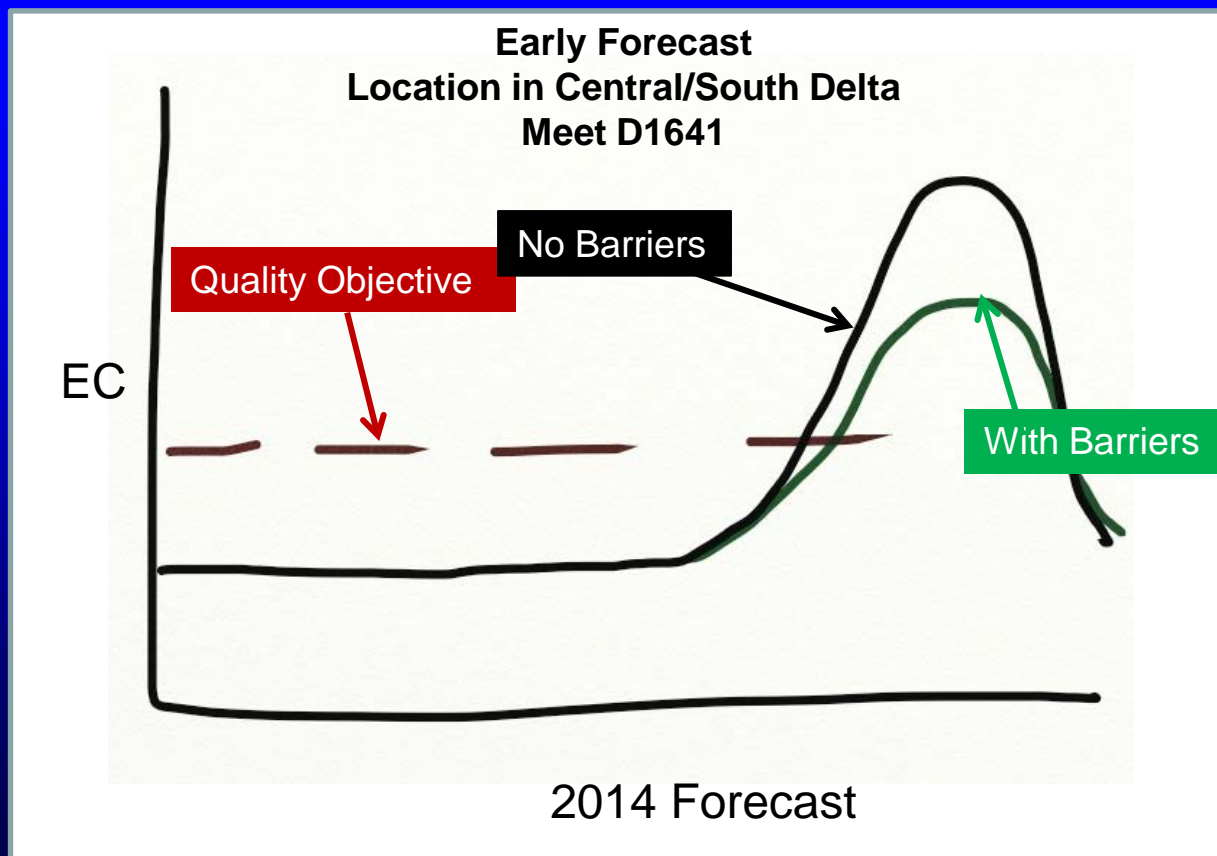


Minimum Releases – Release Storage over Time

2

Forecasts – Let Me Count the Ways

Meet D-1641



Meet WQ Objectives Until Run Out of Reservoir Storage

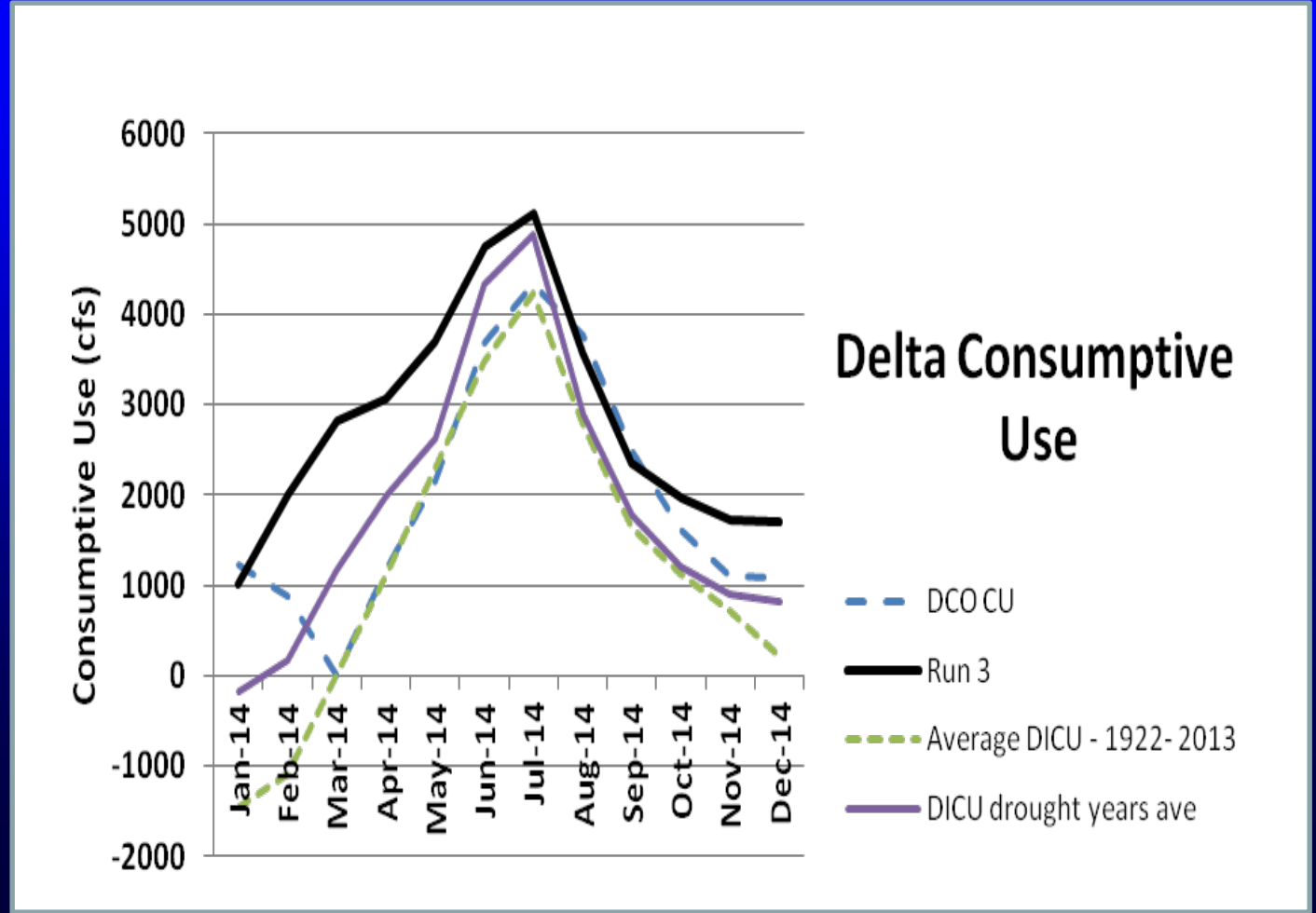
3

Will the Real Consumptive Use Please Stand Up

11-30

Delta Consumptive Use

- CU Has Large Impact in Drought
- Also Uncertainty



3

Will the Real Consumptive Use Please Stand Up

Simple Flow Balance Example

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

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

CU Matters!

4

Yoga For Delta Models

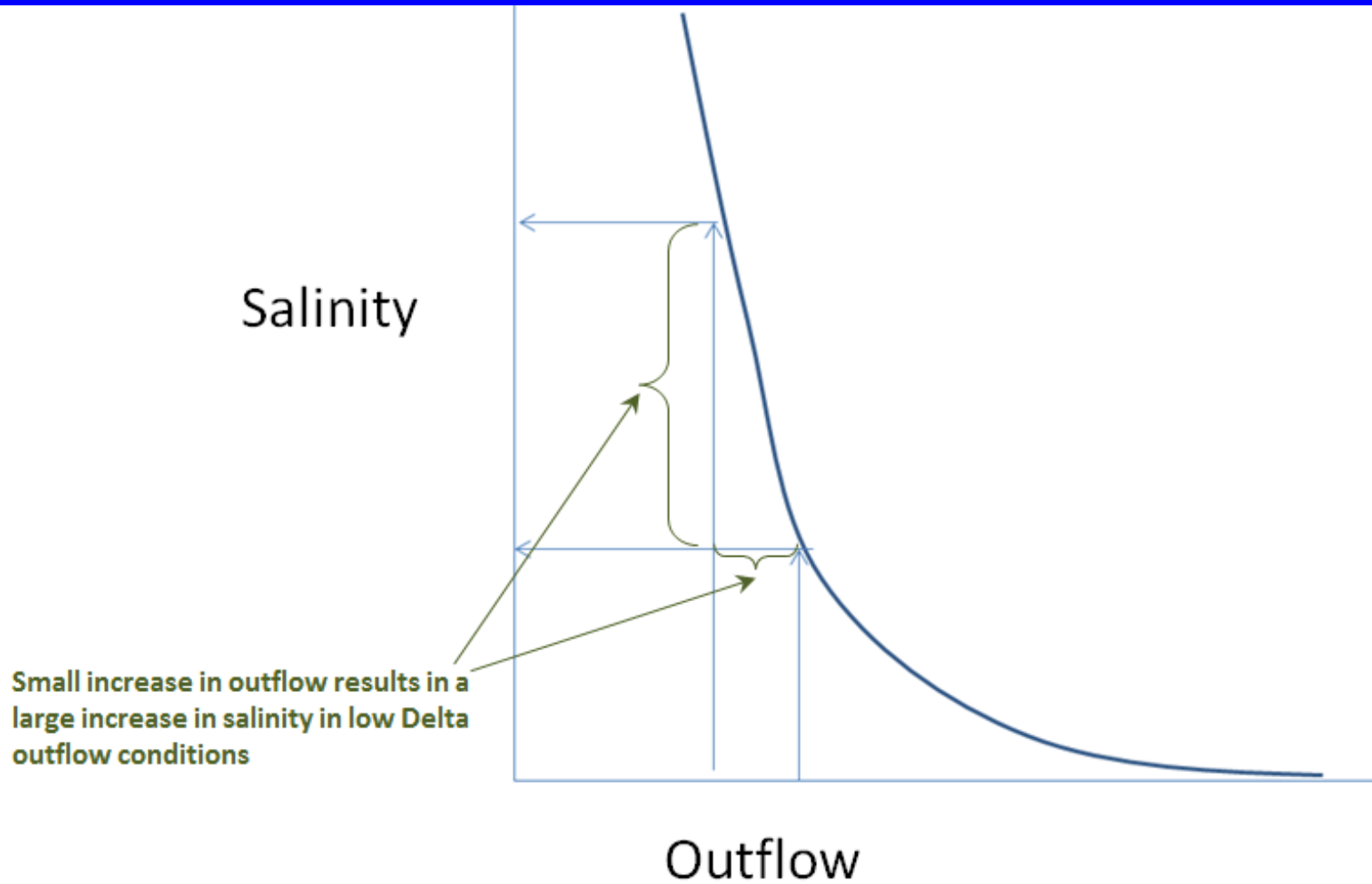


Models Not Calibrated for Extreme Drought – Outside of Historical Record

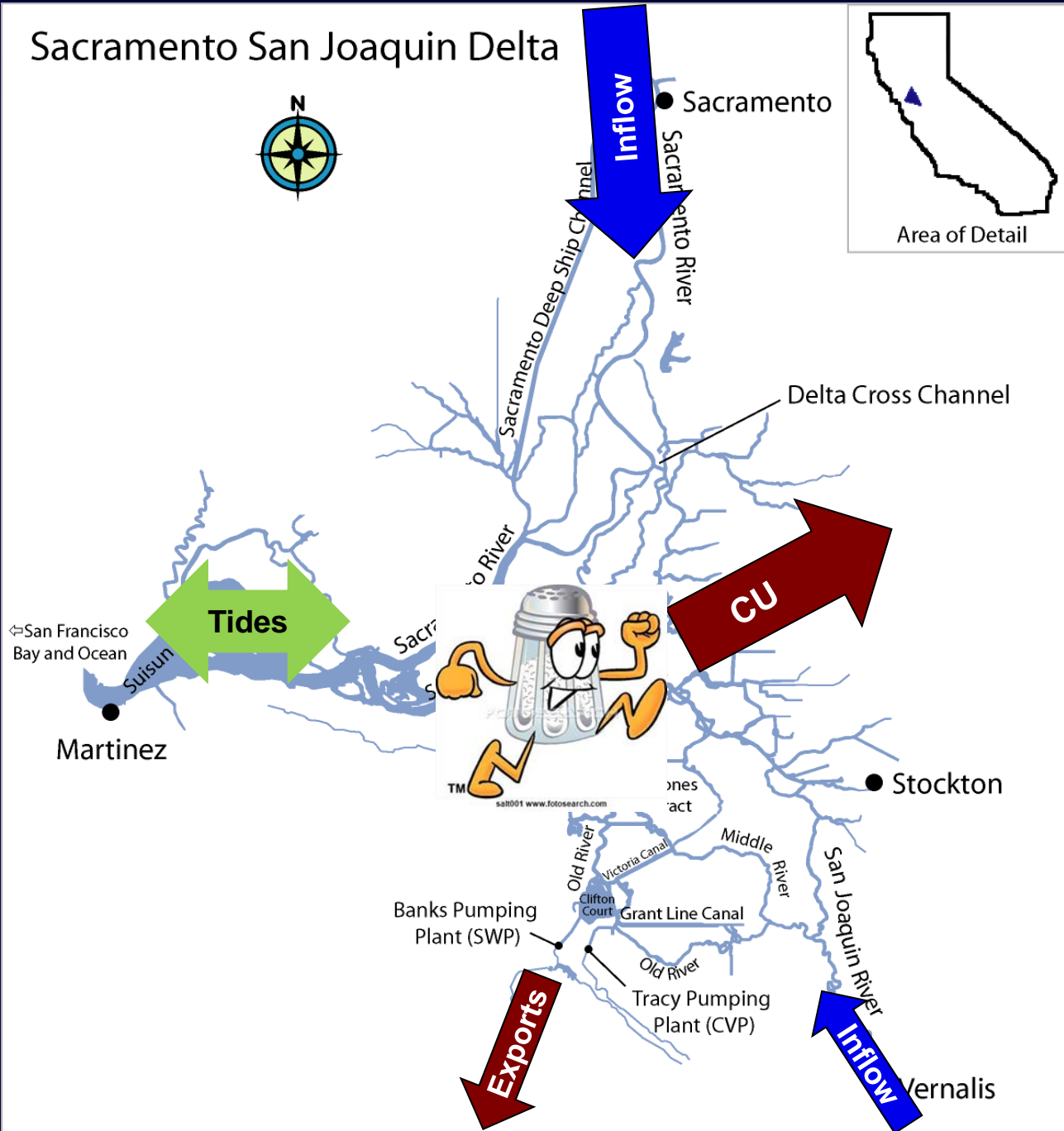


4

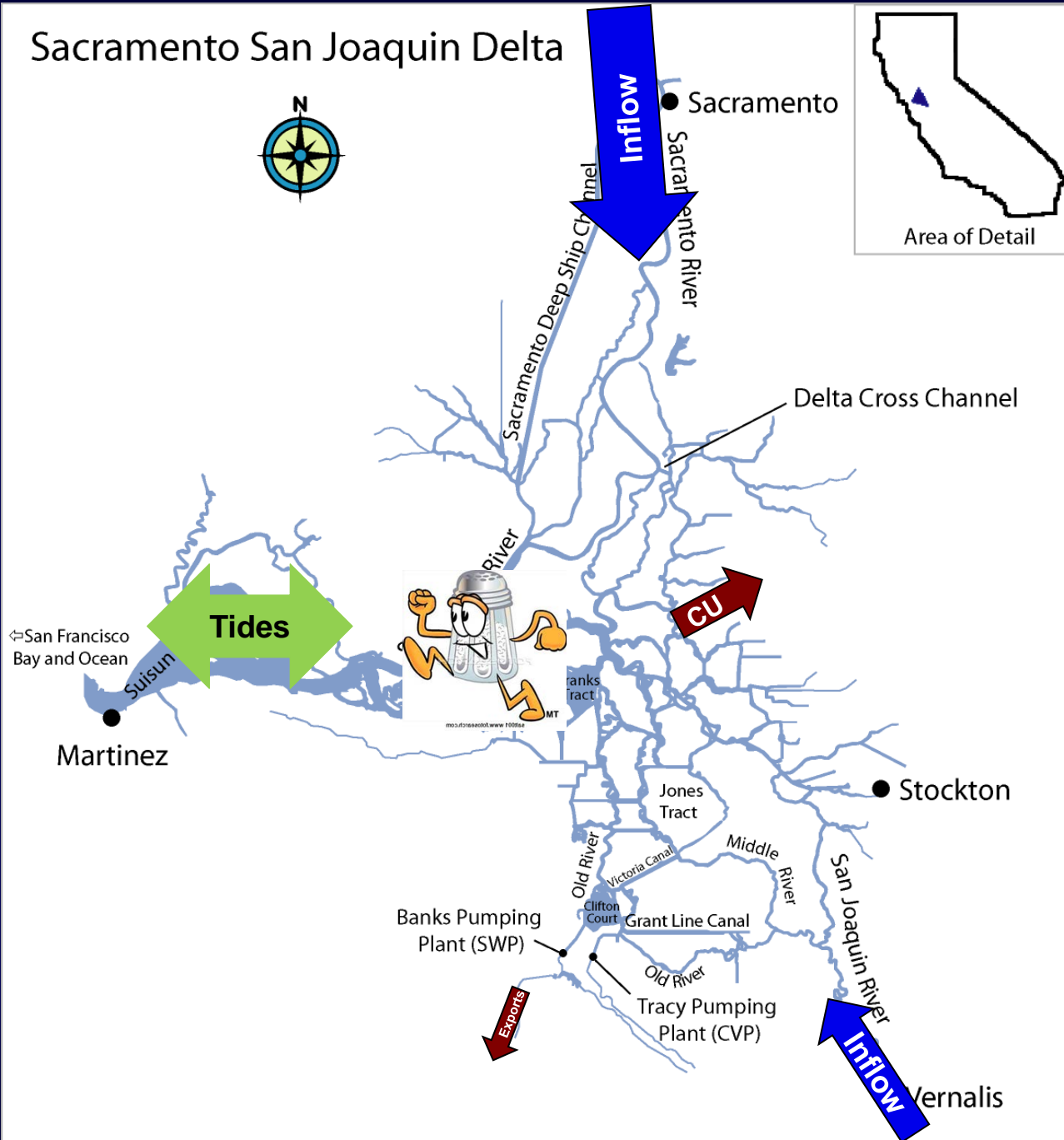
Yoga For Delta Models



Sacramento San Joaquin Delta

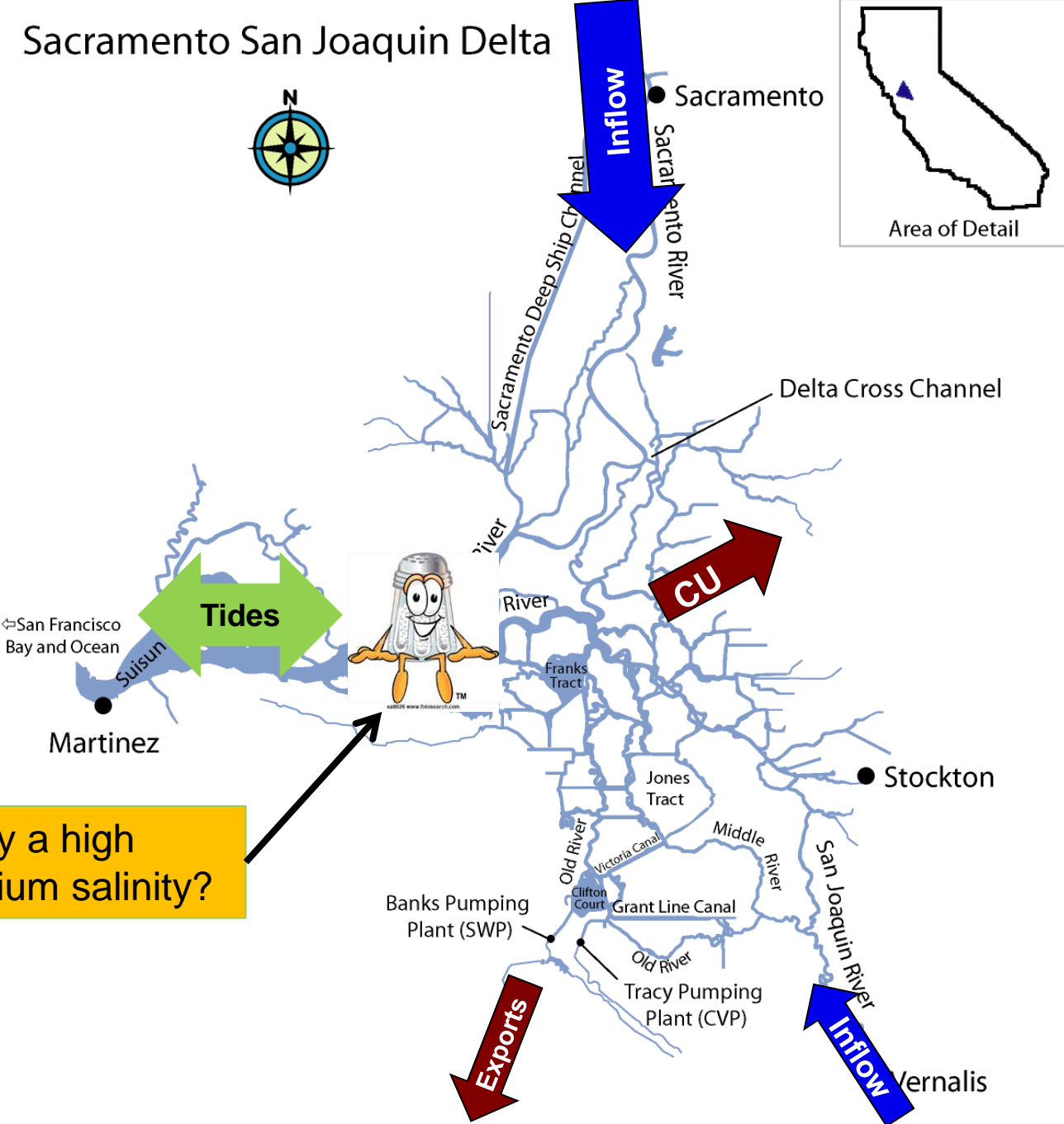


Sacramento San Joaquin Delta



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

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| 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

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|---|----------------------------|--|--|
| 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> | |

