Clarksburg Experiment - Pilot

Previous DCC studies:
Use tools and analytical capabilities
we had on hand

Next Generation DCC exp:
Use tools and analytical capabilities we need

Two aspects of salmon out-migration experiments

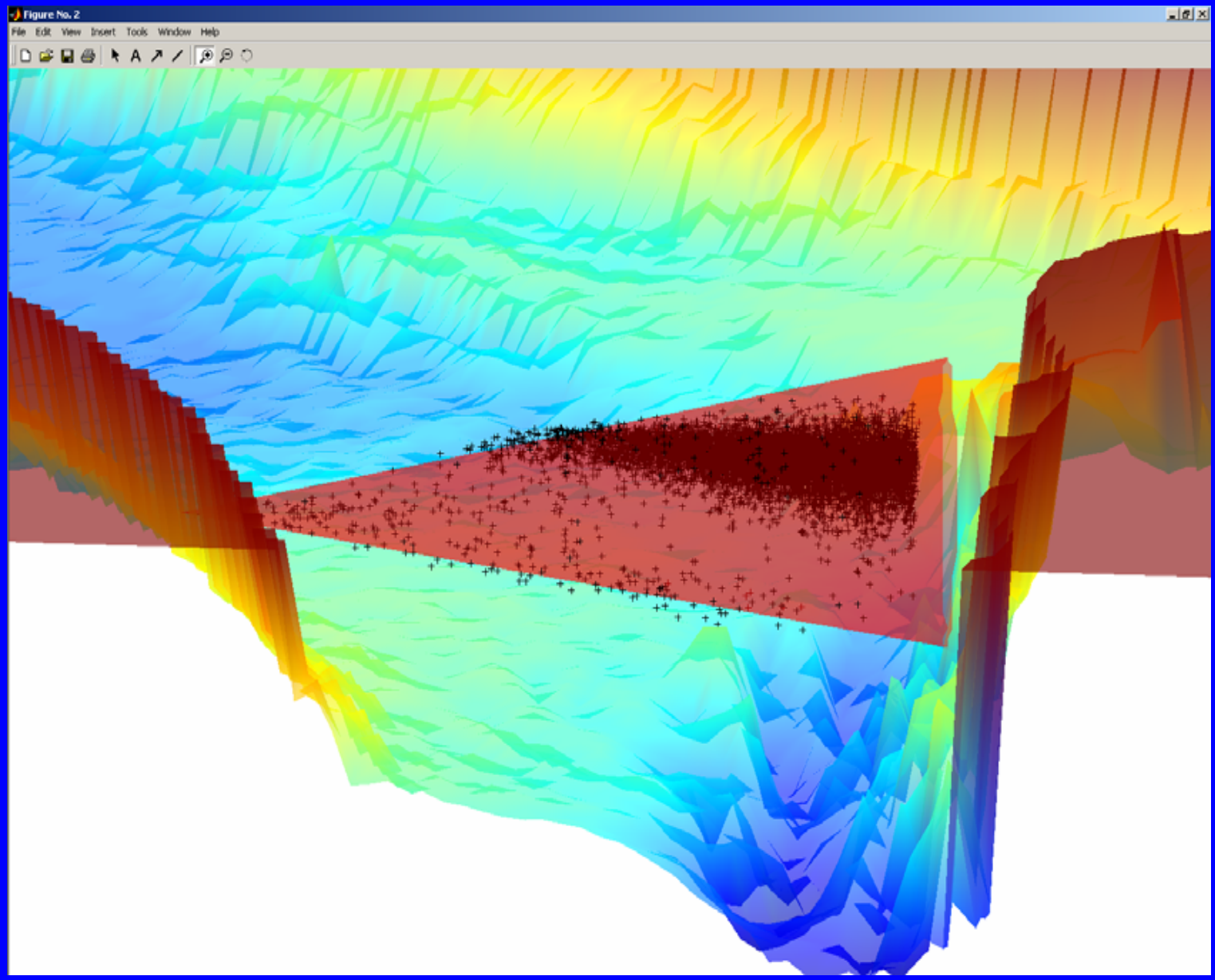
(1) Junction entrainment

(salmon outmigrants do not go with the flow

-Non-homogeneous water column distributions)

(2) Channel segment mortality rates

Salmon are distributed on the outside of the bend



Blake and Horn, in press, Acoustic tracking of juvenile salmon in the vicinity of the Delta Cross Channel, Sacramento River, California – 2001 study results

Purpose of Clarksburg experiment

(1) Junction entrainment

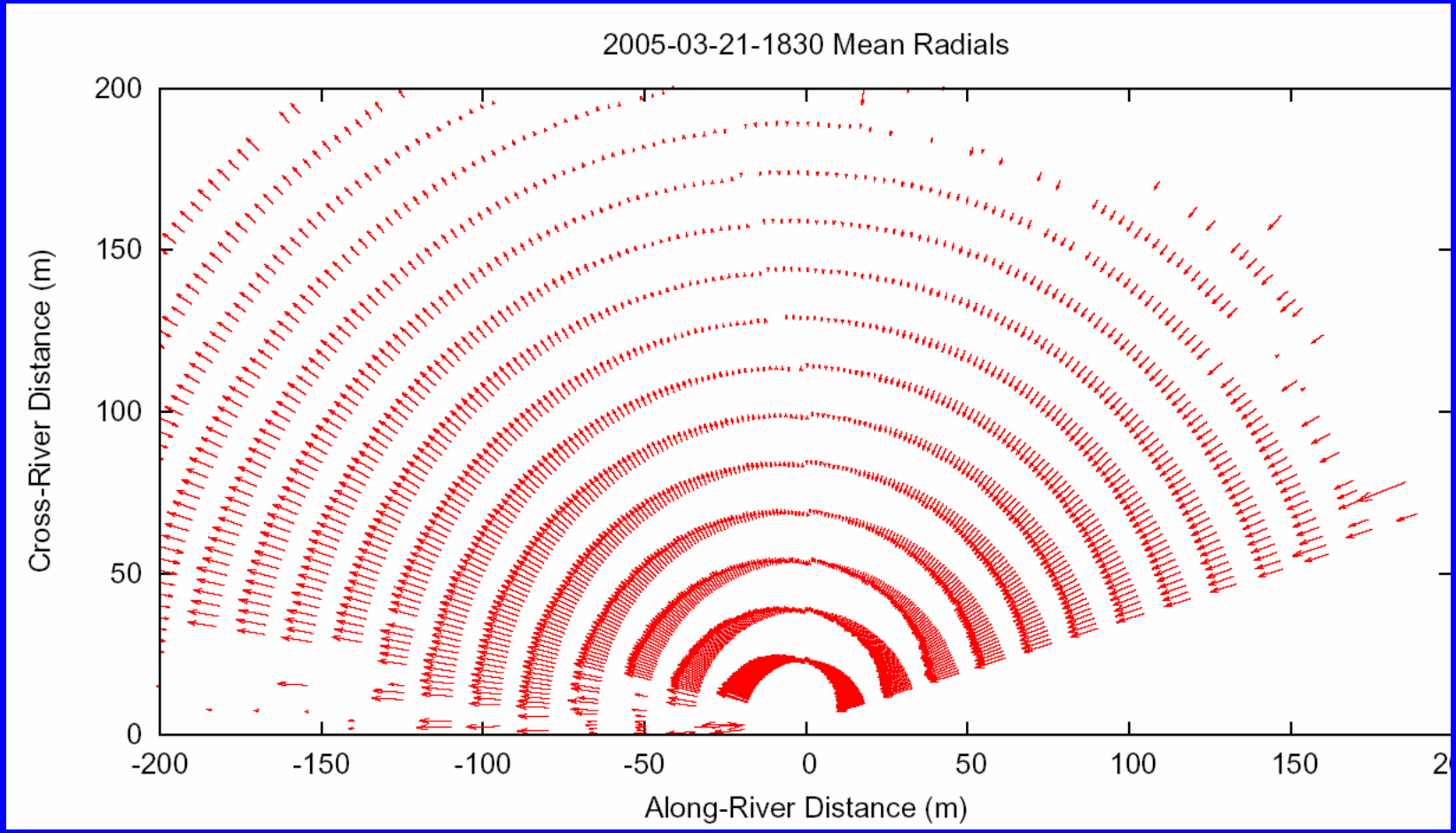
- Study bend hydrodynamics/salmon behavior interaction as a mechanism for generated non-homogeneous salmon smolt spatial distributions

- Develop behavior submodels for inclusion in individual-based particle tracking models

- Test equipment and analytical techniques

Three Mile Slough installation

Radial velocities at 3mi



Sea Robotics

Autonomous Flow mapping

Purpose of Clarksburg experiment

(2) Channel segment survival

- First-cut estimates of mortality rates in select channels

- Test equipment and analytical techniques

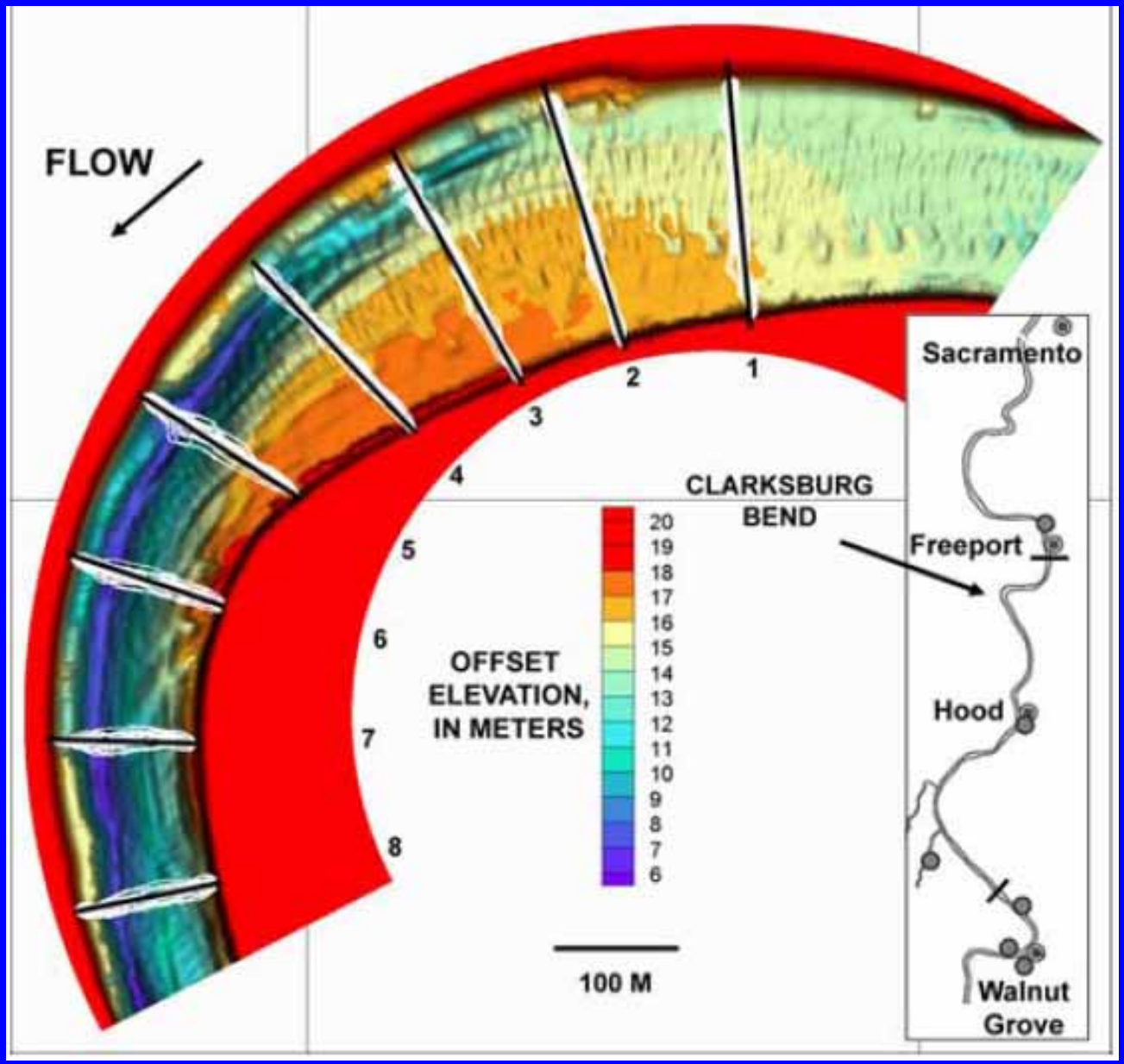
Why Clarksburg bend

(1) Bathymetry – tight bend with typical point bar geomorphology – strong secondary currents

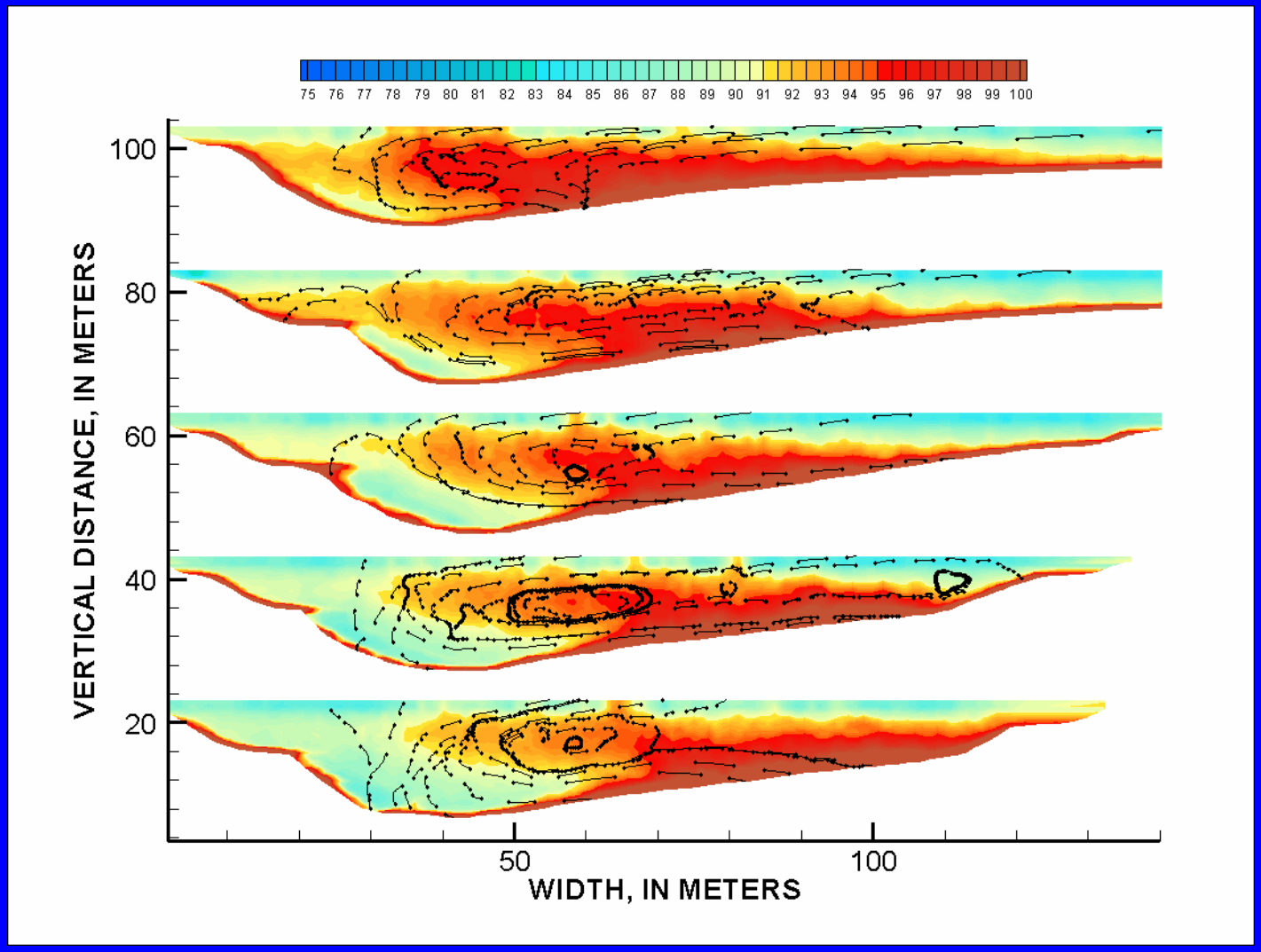
(2) Close to DCC

(3) Weakly tidal

Clarksburg Bend bathymetry

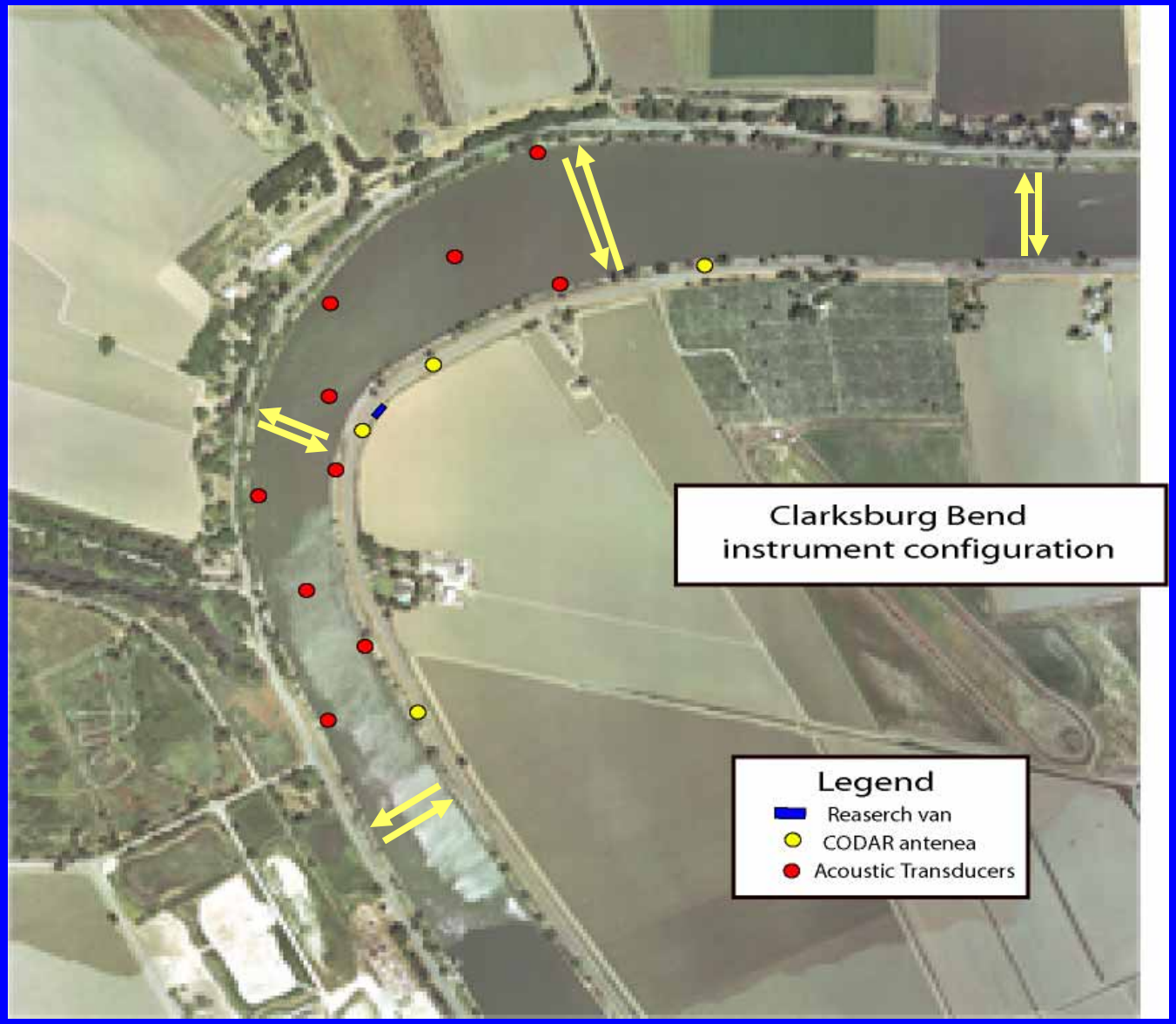


Vertical velocity distributions using boat-mounted systems – Man power intensive

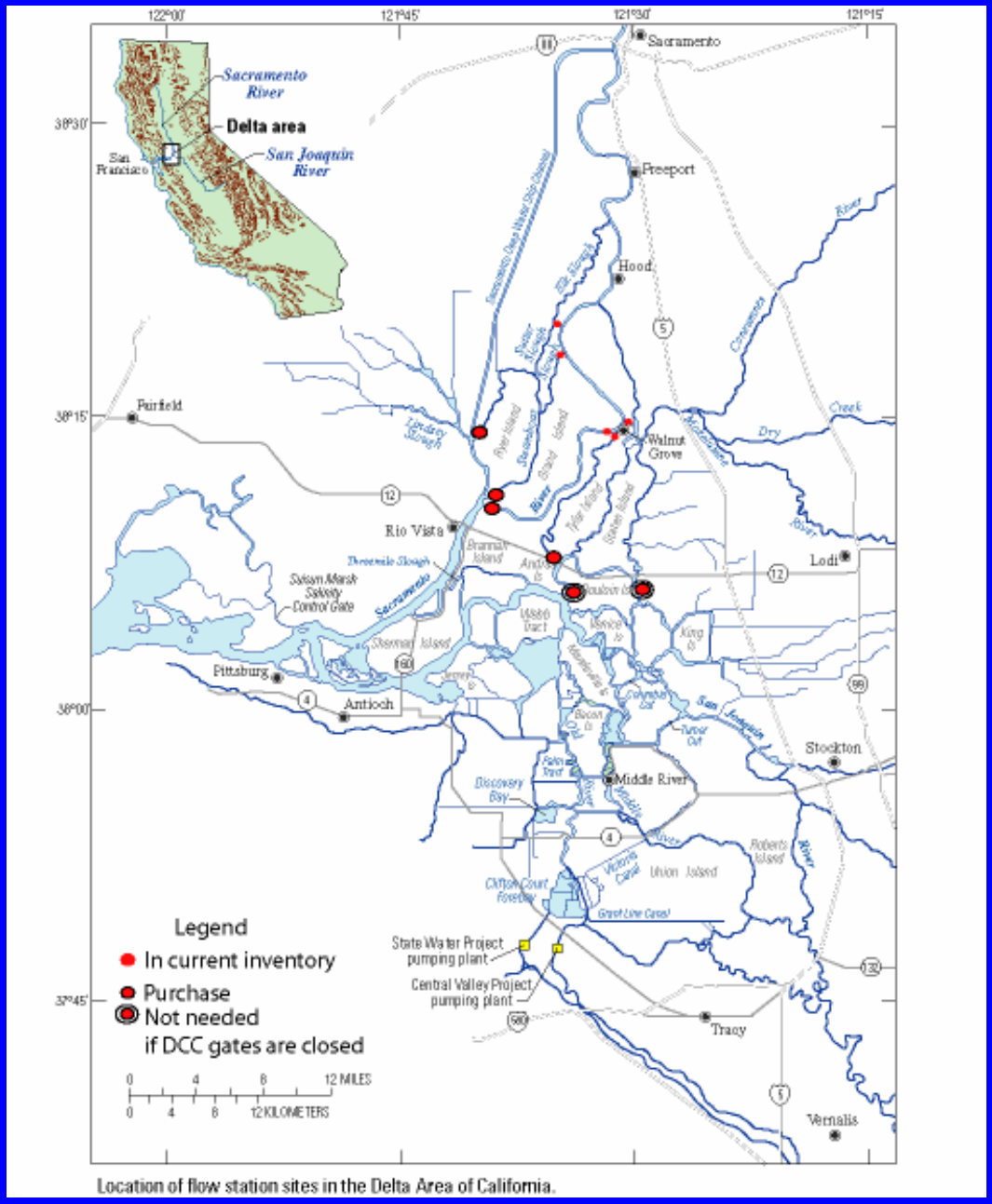


Dinehart, R. and J. Burau, in press, Measurement of secondary circulation and sediment concentrations in river bends using an acoustic Doppler current profiler, Journal of Sedimentology

Clarksburg: Experimental Design



Listening Station Array



Location of flow station sites in the Delta Area of California.

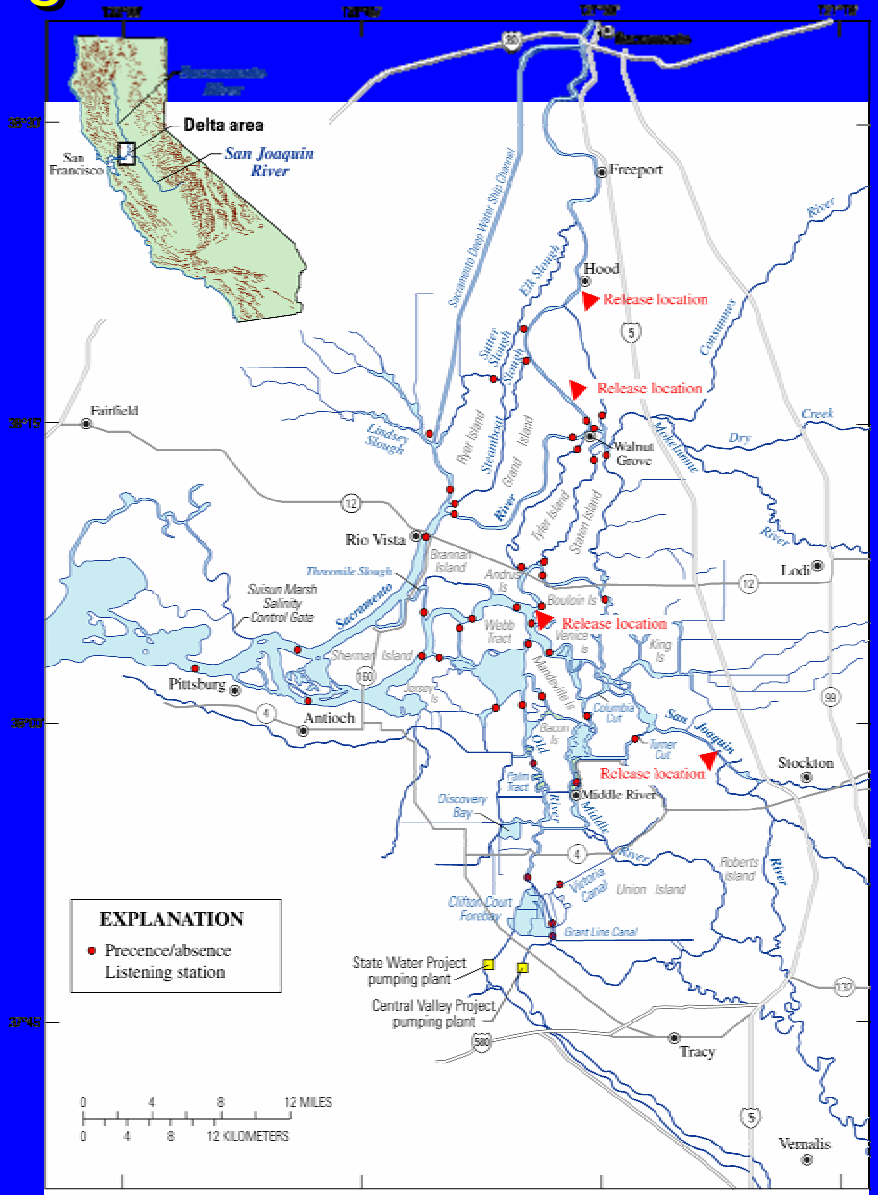
Release Strategy

300 acoustically tagged fish
Releases at 3 Sac River discharges
(low,med,high)
100 fish per discharge
Releases at (morning, day, eve, night)

Coordinate with (USFWS) Pat Brandes

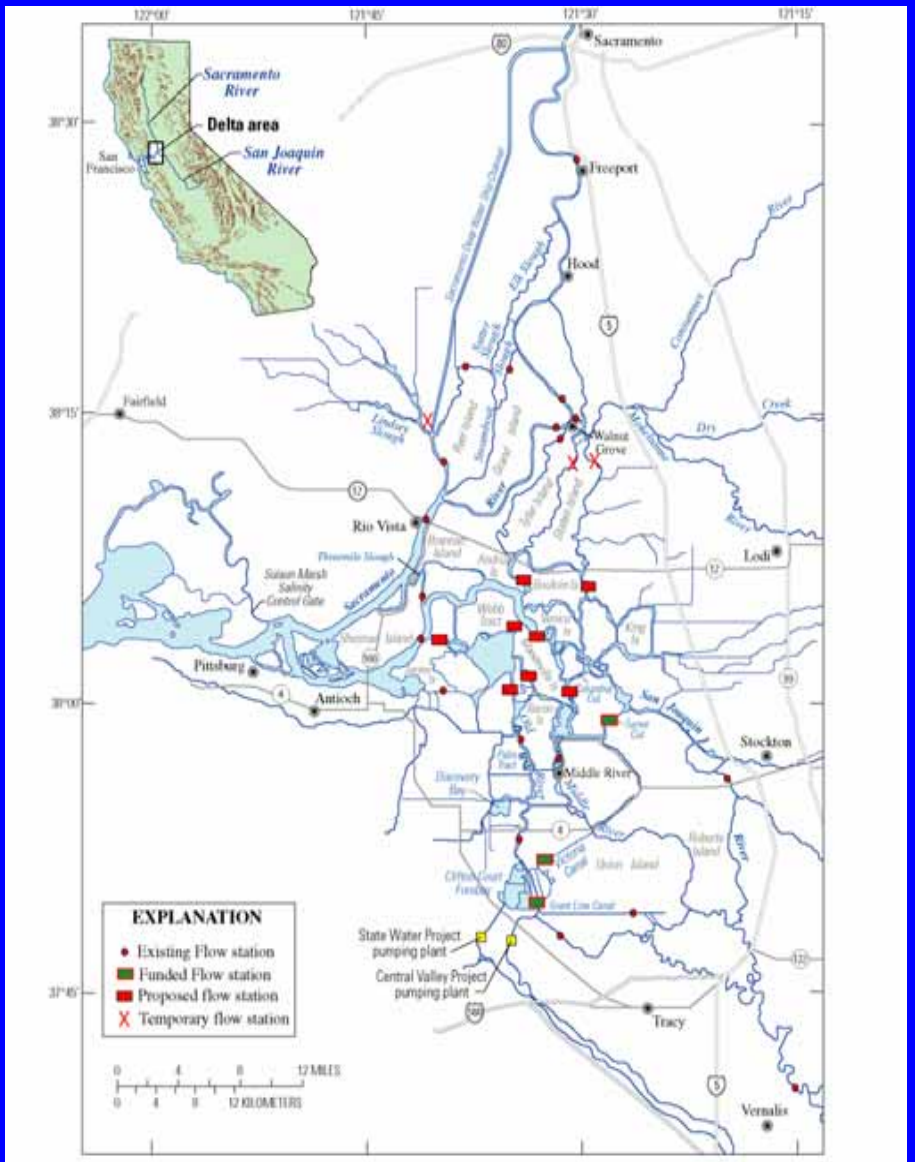
240,000 tagged fish – 6 groups
(targets for hydroacoustics)
(Vemco tagged fish)

Regional salmon survival study



Acoustic tag precence/absence listening stations.

Central Delta Salt flux stations



Existing and proposed flow station locations.
All stations in central and south delta should have temperature/conductivity sensors.
File: nd.flow.plan.ai

Data used for:

(1) DCC water quality impacts

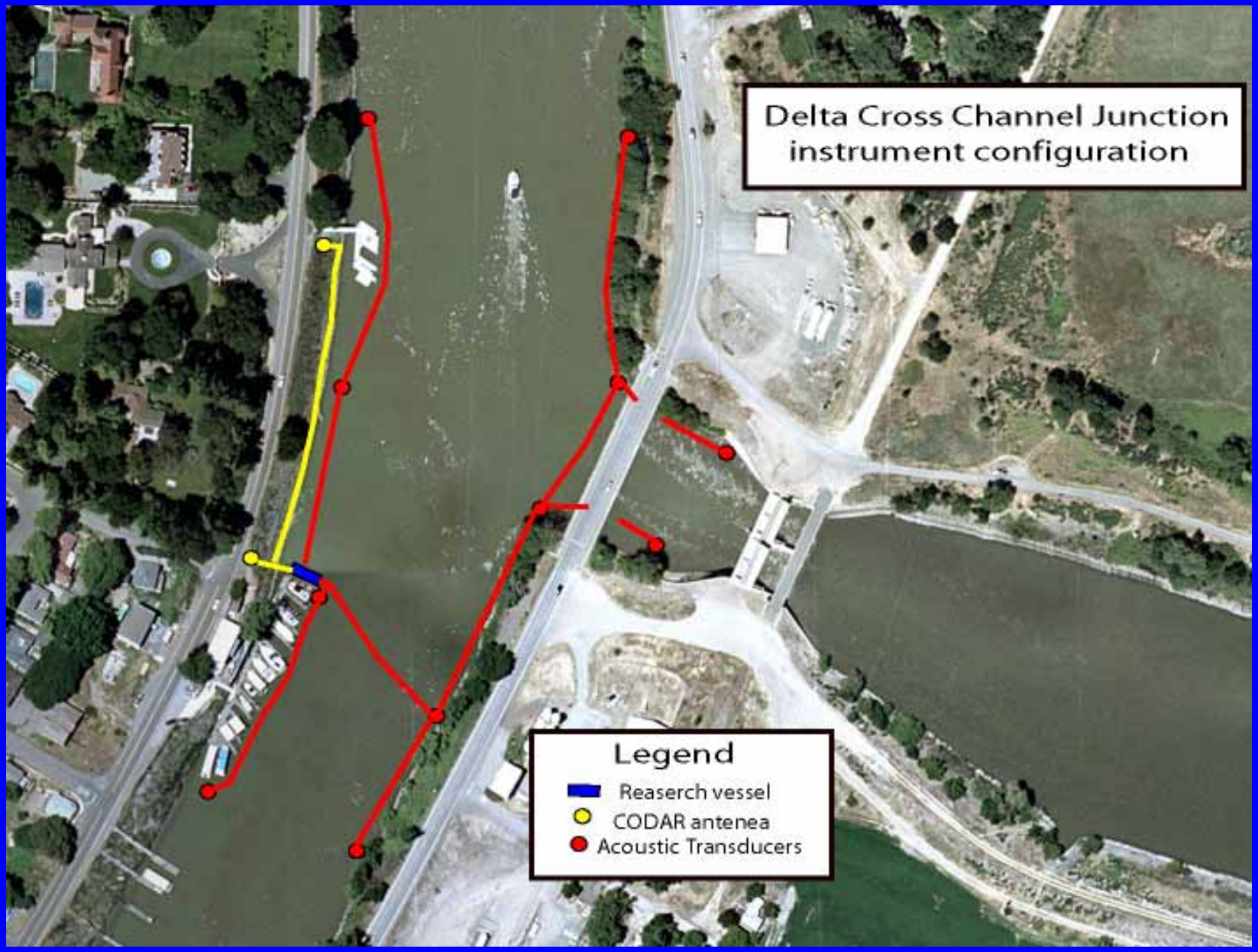
(2) Franks Tract Investigations
- Verification of model res.

(3) Effects of 8500 cfs

(4) Effects of SD barriers

(5) Operations

(6) Evaluation of Franks Tract pilot studies


Delta Cross Channel Junction
instrument configuration
Legend
Reaserch vessel
CODAR antenea
Acoustic Transducers