



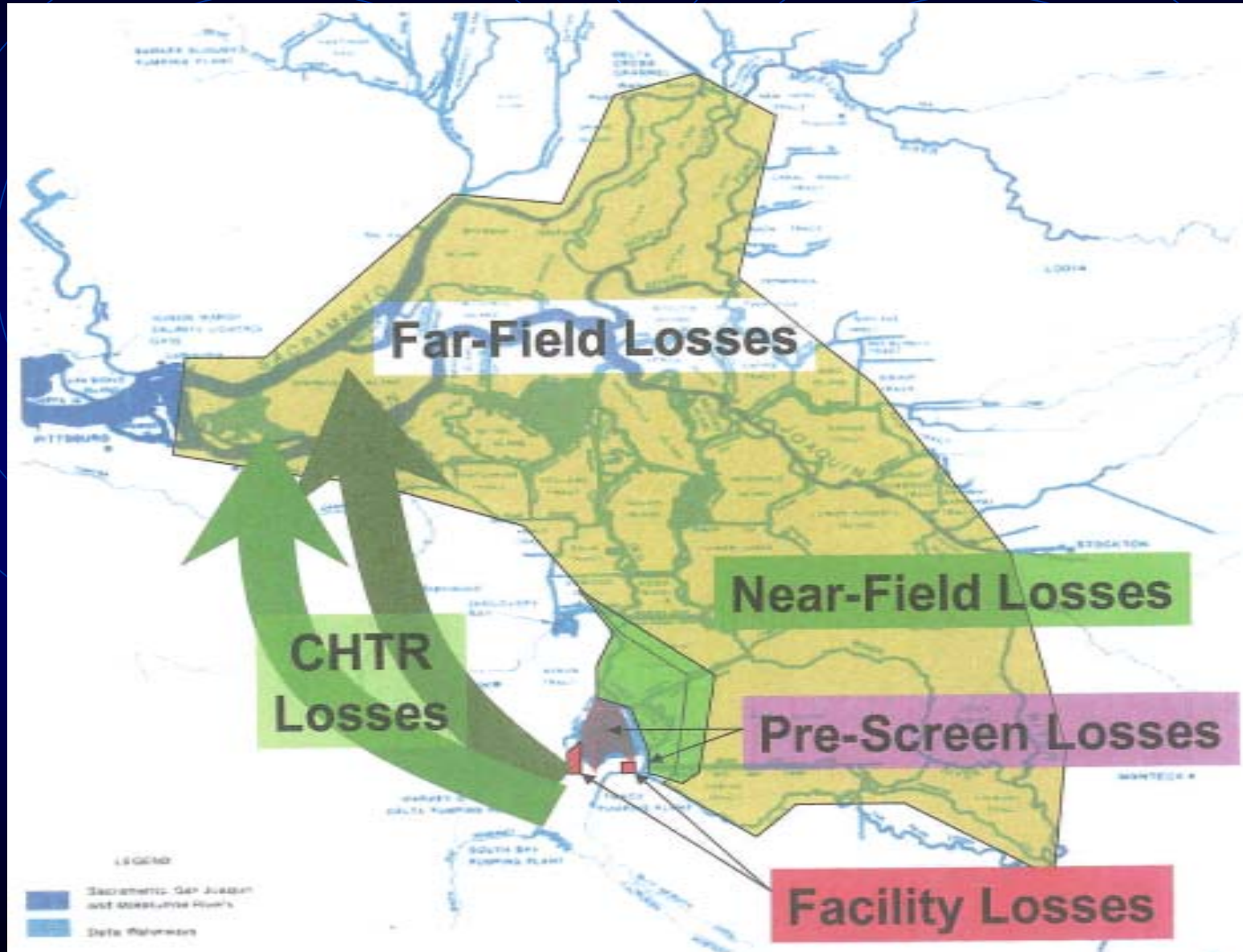
South Delta Hydrodynamics Measurements: Near and Far Field

Principle Investigators:

Jon Bureau: *Detailed Flow Mapping*

Cathy Ruhl: *Flow Monitoring Stations*

The Big Picture – Where does this fit?



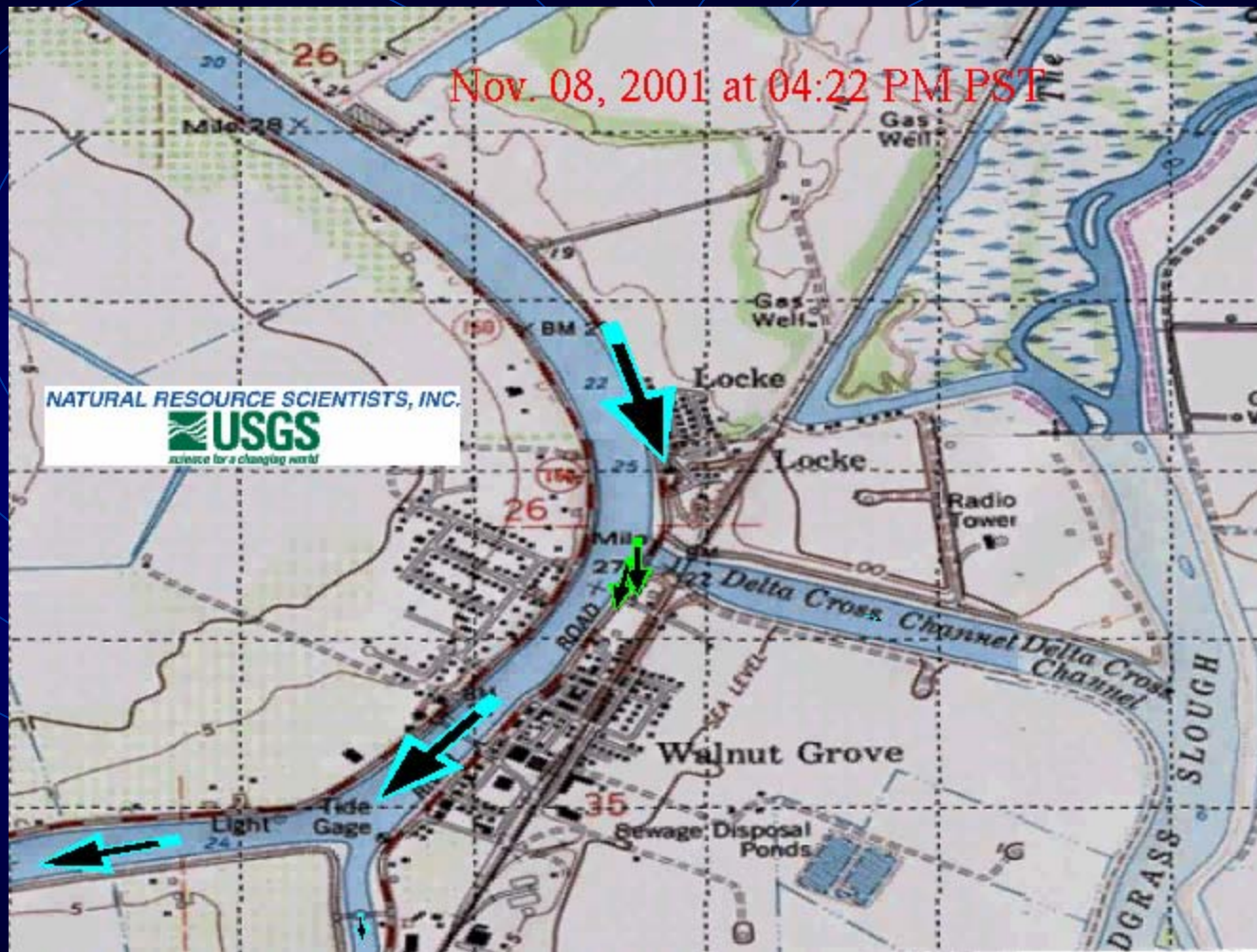
Lessons learned from the DCC

Fish “go” with the water velocity
(A) Within channels (Far field)
(B) Within junctions (Near field)

Implications for the South Delta

- (1) **Where** you put your intake could influence entrainment losses
- (2) **Geometric configuration** of your intake could influence entrainment losses
- (3) **When** you take water (day/night, tidal current phase) could influence entrainment losses

Within channels "fish go with the velocities"

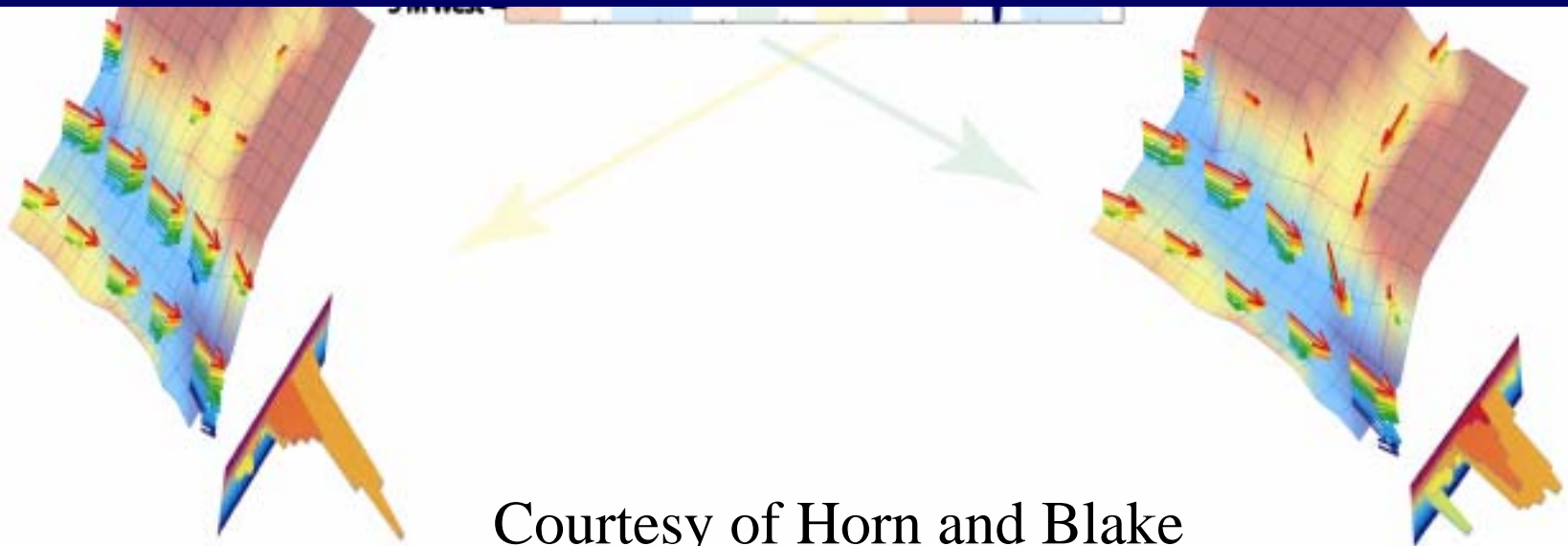


Courtesy of Dave Vogel

Do Smolts Go with the flow?



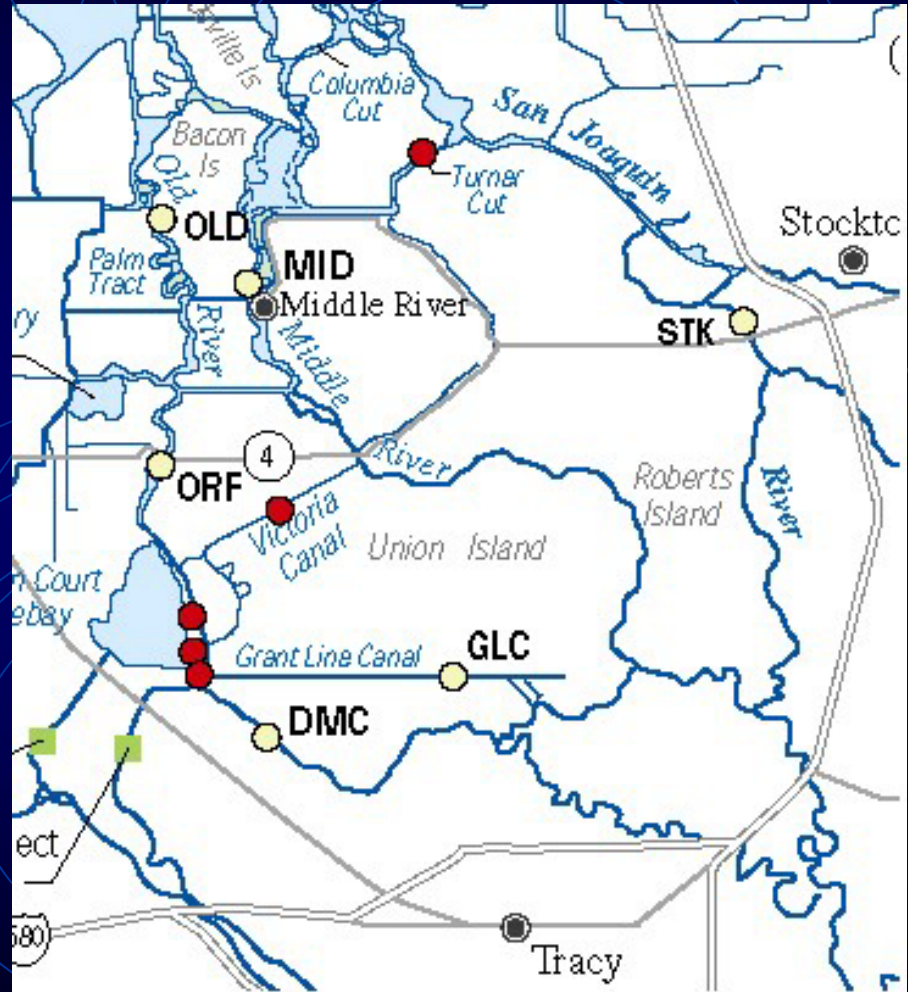
**Smolt spatial distributions are not uniform!
Smolts are concentrated near surface and in
the outside of the bend!**



Courtesy of Horn and Blake

Proposed Flow Monitoring (far field)

- Install and operate flow stations for 3 years
 - Turner Cut
 - Victoria Canal
 - Entrance Clifton Court Forebay
 - Old River South of Clifton Court
 - West Canal North of Clifton Court

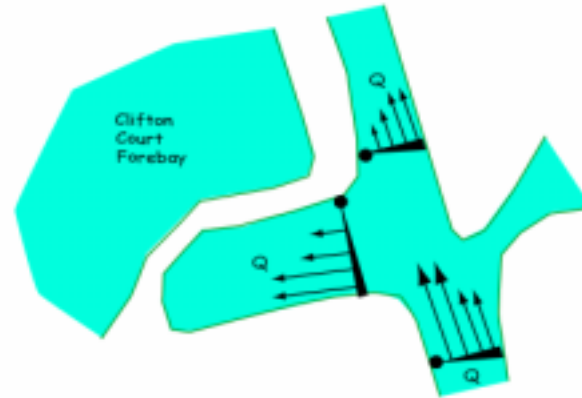


Understanding Junction Dynamics

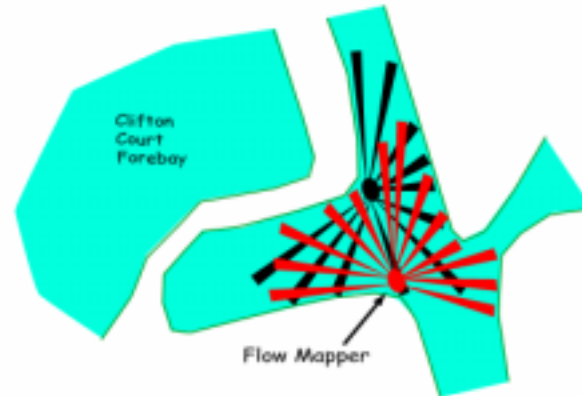
Three additional long-term (~ 3 year) monitoring stations



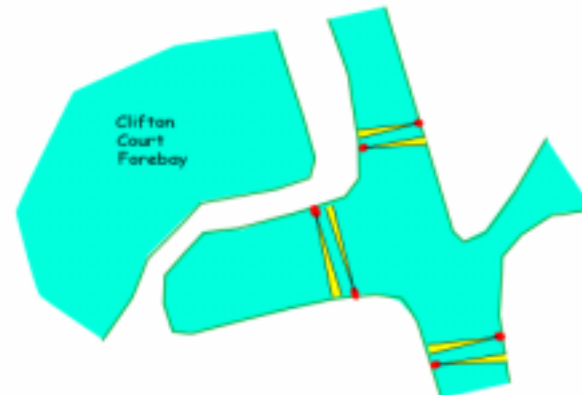
(A) Long-term continuous velocity profile and flow measurements



(B) Hydrodynamic Measurements

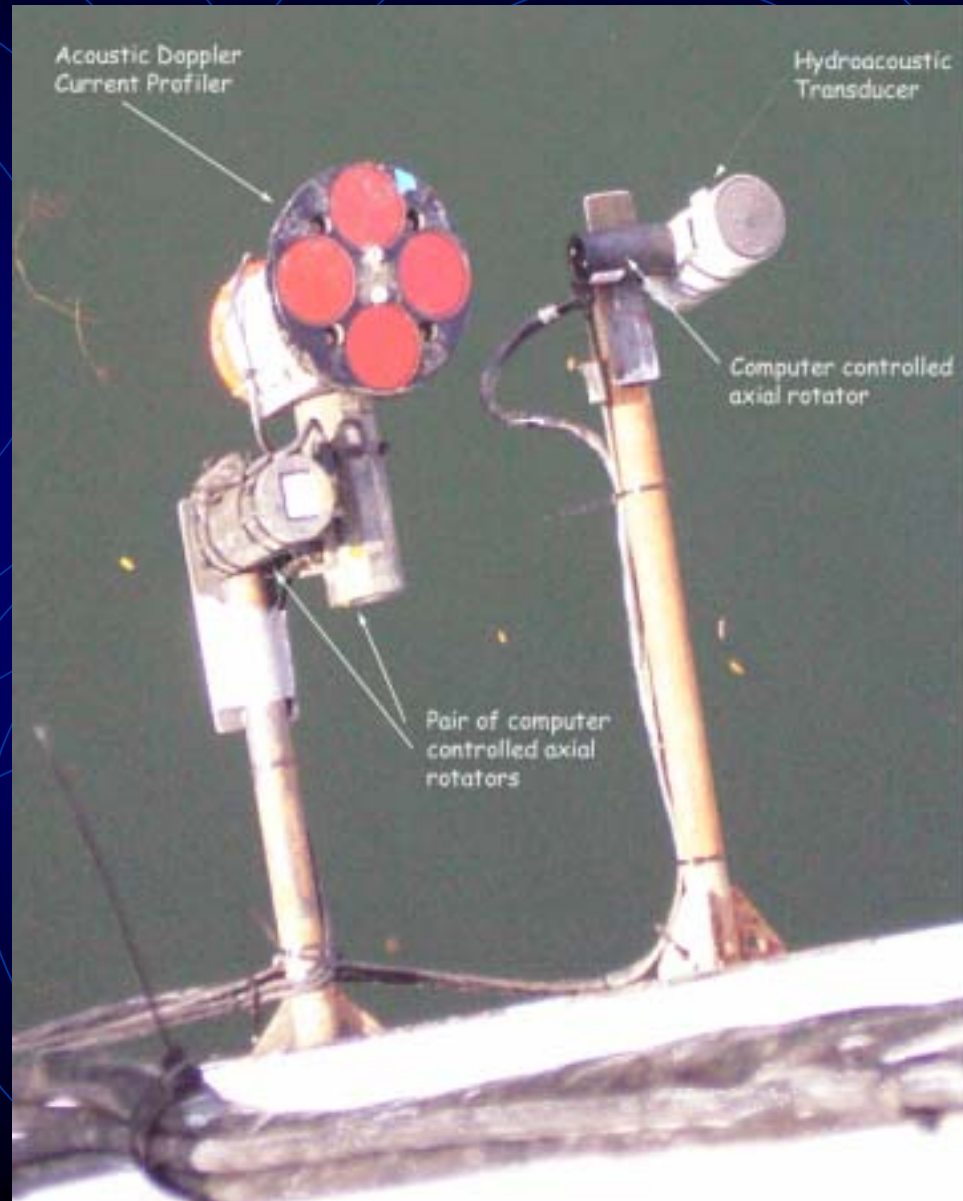


(C) Hydroacoustic monitoring



Velocity Mapper

- High resolution of velocity structure and fish distributions in junctions



Pulling water from the North into CCF

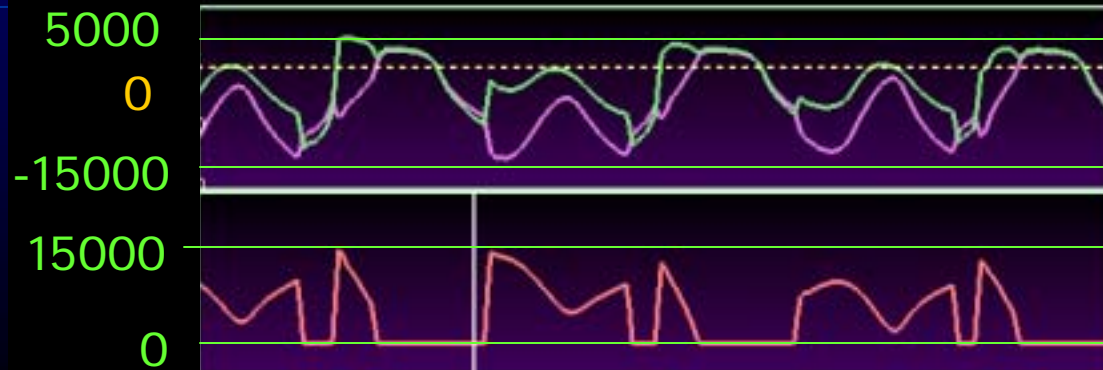
SWP pumping: 5,000cfs
CVP pumping: 4,000 cfs
Combined: 9,000 cfs

Model results courtesy
of Enright and Lee, DWR



Apr. 10, 2000 at 09:55 PM

Flows in channels
Outside CCF gates



South
North

CCF Gate flows

Integration of Hydrodynamics and Fisheries Biology

- Near field understanding of fish entrainment and corresponding hydrodynamic conditions
 - Identify hydrodynamic conditions and export operations that minimize entrainment
 - Correlations between mid- to far-field hydrodynamics, hydroacoustic, and trawling data
 - Manage exports to minimize movements of fish populations into South Delta