



**CONTRA COSTA
WATER DISTRICT**

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January 5, 2007

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Ms. Gita Kapahi, Chief
Bay Delta/Special Projects Unit
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

Subject: Initial Comments on the Southern Delta Water Quality Objectives for Salinity in the Water Quality Control Plan for the San Francisco Bay / Sacramento-San Joaquin Delta Estuary

Dear Ms. Kapahi:

Contra Costa Water District (CCWD) appreciates this opportunity to comment on the southern Delta salinity objectives as part of the State Water Resources Control Board (State Board) request for information on current scientific evidence and proposals for further study of salinity objectives to meet agricultural beneficial uses. CCWD has been an active participant in the recent periodic review of the Water Quality Control Plan and will remain an advocate for protection and improvement of water quality in the Delta.

In this regard, CCWD commends the State Board on its recognition that southern Delta salinity is part of a larger, regional issue and requests the State Board to encourage close coordination of any new studies with ongoing efforts in regional salinity management. CCWD also urges the State Board to study the potential to inadvertently impact other beneficial uses when making changes to objectives or implementation measures. Our initial comments for your consideration are summarized in the following sections.

Comprehensive Approach

CCWD recommends that any new studies be closely coordinated with existing efforts of the Central Valley and Delta Salinity Management Plan, the San Joaquin River Water Quality Management Group, and others, for a comprehensive salinity management strategy, considering multiple methods of implementation. CCWD supports those efforts as an effective way to improve water quality in the southern Delta.

As summarized in the Regional Board report "Salinity in the Central Valley: an Overview" (May 2006), many activities contribute salt to the system through evapoconcentration, dissolution, addition, and import. The report recognizes that the

Federal Central Valley Project and State Water Project (Projects) may affect the regional salt balance by preventing San Joaquin River water from leaving the basin and discharging to the ocean. The Projects intercept the water and export it south, into the upper San Joaquin basin and also into other basins.

Increases in salinity concentration within the Delta will lead to higher salinity concentration in water that is exported and subsequently returned to the Delta via the San Joaquin River, with even higher salt load due to consumptive use. As recognized in these regional efforts, local source control projects may have a substantial effect, but the solution to salt management will only be sustainable through regional recognition, approach, and cooperation.

Consideration of Other Beneficial Uses

Municipal and Domestic Supply (MUN) Beneficial Use

Although designed to protect agricultural beneficial uses, the southern Delta salinity objectives provide incidental protection for municipal and domestic beneficial uses. As expressed by the United States Environmental Protection Agency (posted on the State Board website as EPA-04),

Apart from the primary question of protecting agricultural uses, we are also concerned that changes in the Vernalis standard may have adverse impacts on drinking water source quality.

The State Board has recognized that “significant water quality degradation can occur in the absence of standards violations”¹. In accordance with state and federal anti-degradation policies, any modifications to water quality standards shall not be detrimental to other beneficial uses. Similarly, implementation of one or more objectives must not redirect impacts to other beneficial uses.

As discussed in CCWD’s comments during the periodic review (CCWD-20), relaxing the salinity objectives in the southern Delta will, at certain times, dramatically increase Delta salinity. The impact of changes in salinity at the southern Delta compliance locations on water quality at CCWD’s intakes is a function of the fraction of CCWD’s water supply that comes from the compliance locations, which is a function of the hydrodynamics of the Delta. Flows entering the Delta on the Sacramento and San Joaquin Rivers govern a large portion of the variability in CCWD’s water supply source; however, in-Delta operations, including the Delta cross channel gates in the north Delta and temporary barriers in the South Delta, also impact the distribution of CCWD’s source water.

¹ See attached July 28, 2004, letter from Victoria Whitney (State Water Resources Control Board) to Chester Bowling (U.S. Bureau of Reclamation) and Carl A. Torgersen (Department of Water Resources) regarding the Water Quality Response Plan for the operation of the Joint Points of Diversion.

For this reason, any changes to salinity objectives should also consider the operational changes that may be used to meet these objectives.

Estuarine Habitat (EST) and Rare, Threatened, or Endangered Species (RARE) Beneficial Uses

Recent research, linking water quality with abundance of delta smelt, offers evidence that salinity standards also have the potential to provide incidental protection for EST and RARE beneficial uses.

The correlation between fall salinity in the Delta and abundance of delta smelt has been established in work by CCWD and others. Since the early 1990s, a number of factors have contributed to increased fall salinity, degrading water quality even in above normal and wet water years (1997, 1999, 2000, and 2003). The downward trend in fall water quality is echoed in the decrease in delta smelt abundance, indicating high fall salinity may be a factor in the decline in fish populations². The pelagic organism decline (POD) workgroup is conducting studies to evaluate various possible factors; preliminary results indicate poor water quality may be a common thread across multiple studies.

Study Recommendations

CCWD requests that any increase in salinity objectives or approval of implementation measures that may impact flows or salt loads be evaluated for their effects on other beneficial uses throughout the Delta. This evaluation should include computer modeling of the water quality at municipal intakes in the Delta to determine the effect of the proposed changes for both existing and future conditions.

Modeling results should include tables of monthly averaged water quality impacts at the location of municipal intakes and long-term monitoring stations within the Delta, with discussion of the maximum and minimum daily values. CCWD also recommends the results include water quality at currently proposed municipal intakes on Victoria Canal (CCWD) and on the San Joaquin River at Empire Tract (City of Stockton). In addition, we request that CALSIM model output and daily DSM2 model output files be made available to interested parties in electronic form. CCWD will use information from these files as inputs to our operations model to evaluate the impacts on our ability to supply high quality drinking water to our customers in all seasons and year types.

CCWD has recently completed the re-location of an agricultural drain from Rock Slough that has resulted in immediate improvements in water quality. CCWD suggests that the SWRCB conduct studies to determine if similar projects will result in water quality improvements in key areas of the southern Delta, particularly in channels with

² See attached slides presented by Greg Gartrell at the Environmental Water Account Review, November 27, 2006

Ms. Gita Kapahi, Chief
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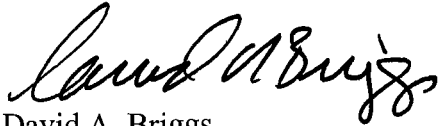
stagnant or near stagnant conditions. Studies on the efficacy of Best Management Practices to reduce drainage quantities (loads) and improve drainage water quality (concentration) should also be conducted.

Summary

In conclusion, CCWD recommends that the State Board continue to evaluate salinity management with a regional foundation while addressing local objectives. Analysis for changes to salinity objectives or implementation measures must include considerations of all beneficial uses, be consistent with the anti-degradation policy, and look to multiple sources of salinity and solution tools.

If you have any questions, please call me at (925) 688-8073.

Sincerely,

A handwritten signature in black ink, appearing to read "David A. Briggs". The signature is fluid and cursive, with the first name "David" being the most prominent.

David A. Briggs
Water Resources Manager

DAB/ds

Enclosures



State Water Resources Control Board



Terry Tamminen
*Secretary for
Environmental
Protection*

Division of Water Rights
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Arnold Schwarzenegger
Governor

July 28, 2004

Chester Bowling, Operations Manager
U.S. Bureau of Reclamation
Central Valley Operations Office
3310 El Camino Ave. Suite 300
Sacramento, CA 95821

Carl A. Torgersen, Chief
SWP Operations Control Office
Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Dear Mr. Bowling and Mr. Torgersen:

WATER QUALITY RESPONSE PLAN PURSUANT TO DECISION 1641

This letter responds to your letter dated July 1, 2004 submitting the Water Quality Response Plan (WQRP) for Stage 1 and Stage 2 Joint Points of Diversion (JPOD) operations pursuant to State Water Resources Control Board (SWRCB) Decision 1641 (D-1641). Prior to use of each other's points of diversion in the Delta (referred to as JPOD), D-1641 (condition 5 on pages 150 and 151 and condition 5 on page 156) requires the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (USBR) to develop a response plan with input from Contra Costa Water District (CCWD) that is acceptable to the Chief of the Division of Water Rights (Division). The plan is required to ensure that water quality in the southern and central Delta will not be significantly degraded through operations of JPOD to the injury of water users in the southern and central Delta.

Previously, DWR and USBR (the Projects) submitted a draft of the WQRP for my approval. However, I did not approve that plan because there was inadequate information concerning the potential impacts on water quality related to JPOD diversions and CCWD and the Projects disagreed concerning whether the previous plan provided adequate protection. By letter dated March 19, 2004, I requested that you conduct modeling analyses to determine the impacts on water quality at CCWD's intakes related to JPOD at times when CCWD is authorized to divert water under its own water rights. I asked that you analyze potential impacts by comparing hydrological conditions absent JPOD under SWRCB Decision 1485 (D-1485) criteria to conditions that occur with JPOD under SWRCB Decision 1641 (D-1641) criteria. I directed you to use the information derived from the modeling to prepare a draft WQRP with recommendations to the SWRCB regarding whether any modeled impacts would be significant and suggesting appropriate mitigation for any potentially significant water quality impacts. I indicated that the Projects are not required to propose mitigation for impacts that may occur to

California Environmental Protection Agency

water quality when CCWD is diverting under its Central Valley Project (CVP) contract or rediverting transferred water, as long as the water quality objectives will be met.

Pursuant to my request you prepared modeling of potential water quality impacts and a WQRP. You state that in most cases, the modeling analyses show water quality conditions under D-1641 with JPOD to be better than conditions under D-1485 without JPOD. You state that in a few instances where a rise in salinity occurs, it is only slight or it does not raise the salinity to a level that makes the water unusable to CCWD. You point out that salinity remains well below the water quality objectives for municipal and industrial uses contained in D-1641. As a result, you state that any possible increases in salinity resulting from JPOD do not meet the criteria for injury under the Water Code.

The WQRP includes four basic conditions similar to conditions included in the previous plan. The first condition states that DWR and USBR will meet water quality objectives (included in D-1641 and required by their permits) for western Delta agricultural beneficial uses, and for Delta municipal and industrial (M&I) beneficial uses “assuring that no change in water quality will rise to the level that would cause injury to water users in the southern and central Delta.” The second condition states that DWR and USBR will assess carriage water costs to third parties for water transfers in order to maintain water quality objectives included in D-1641 and to protect DWR’s and USBR’s water supplies. The Projects note that during JPOD operations, DWR and USBR supply the carriage water to meet any additional water costs associated with JPOD diversions. The third condition states that DWR will provide CCWD with seasonal forecasts of JPOD operations and water transfers. The fourth condition states that DWR and USBR will meet with CCWD to determine the extent to which the quantities of water diverted to CCWD pursuant to its CVP contract should be adjusted to compensate CCWD for any changes in allowable diversions related to changes from excess to balanced¹ conditions related to JPOD diversions².

CCWD provided comments on May 26, 2004 based on a draft of the WQRP. In your letter, you address those comments. You state that some of the changes suggested by CCWD were made, while others were not. Following submission of the final WQRP, CCWD provided additional comments by letter dated July 23, 2004 in addition to an analysis requested by SWRCB staff of how changes in salinity affect CCWD’s operations. Following is a discussion of the positions held by the Projects and CCWD.

¹ Balanced water conditions means periods when DWR and USBR agree that releases from upstream reservoirs plus unregulated flow approximately equal the water supply needed to meet Sacramento Valley inbasin uses, plus exports. Excess water conditions means periods when DWR and USBR agree that releases from upstream reservoirs plus unregulated flow exceed Sacramento Valley inbasin uses, plus exports (i.e., additional water is available in the system).

² CCWD is not authorized to divert water under its own water rights during balanced conditions.

CCWD requests that the first condition of the WQRP be modified to acknowledge that water quality impacts may occur even when the Projects are meeting the water quality objectives. CCWD suggests the language be changed as follows:

Reclamation and the Department will meet D-1641 standards required by their water right permits for western Delta agricultural beneficial uses and for Delta municipal and industrial beneficial uses AND WILL ASSURE ~~assuring~~ that no change in water quality will rise to the level that would cause injury to water users in the southern and central Delta.

In addition, CCWD requests that the following condition be added to the WQRP:

Prior to using JPOD during excess conditions when CCWD's Los Vaqueros water rights permit conditions are met, the Projects will provide modeling results to CCWD and consult with CCWD regarding operational changes to ensure impacts are avoided.

The Projects disagree with CCWD's claim that JPOD will degrade water quality significantly to the point of injury. The Projects argue that beneficial use objectives are the measure for determining if water quality is adequate for the intended beneficial use. The Projects state that because the M&I water quality objectives will be met during JPOD operations, and because CCWD is an M&I water user, it will not be injured. CCWD argues that it may be injured even if water quality objectives are met. The Projects state that to accept this claim would in essence create a new water quality objective in the Delta for CCWD's rights.

CCWD's water rights are senior in priority to approval of JPOD. Consequently, DWR and USBR are responsible for preventing significant degradation to the quality of water diverted by CCWD under its own water rights. As I stated in my letter of March 19, 2004, significant degradation of water quality may occur in the absence of violation of water quality objectives in cases where the degradation impairs a senior water right of water of a usable quality. CCWD claims that any degradation in water quality impairs its ability to divert and use water under its water rights. CCWD may reasonably expect to receive a water quality similar to what existed under the regulatory conditions that existed when CCWD obtained its water right permits from the SWRCB. At that time, DWR and USBR were required to operate their projects pursuant to D-1485 requirements. Consequently, impacts to CCWD's water rights may occur if use of JPOD pursuant to D-1641 causes average annual degradation in water quality below that which would have occurred under D-1485 without JPOD. Whether or not these impacts are considered significant depends upon how the change in water quality affects CCWD's operations.

As requested by SWRCB staff, CCWD provided an analysis concerning the effects of changes in water quality on CCWD's operations. CCWD states that average year round increases in chloride levels of 0.4 mg/l, 0.5 mg/l, and 3.2 mg/l would result in an effective loss of 2,500 acre-feet, 3,000 acre-feet, and 10,000 acre-feet of Los Vaqueros Reservoir storage respectively based on CCWD's own criteria for operations of Los Vaqueros. Modeling conducted by the Projects comparing water quality under D-1485 with water quality under D-1641 with JPOD indicates

that water quality may either improve or worsen on an average annual basis. However, JPOD diversions typically occur at times when CCWD is not authorized to divert under its Los Vaqueros water rights. Consequently, potential impacts to CCWD resulting from JPOD are infrequent.

In addition to CCWD's claim that it may be impacted when it is diverting under its own water rights, CCWD also makes the argument that it has made previously that it should be protected against all significant water quality impacts at its intakes whether CCWD is diverting water under its own water right or its CVP contract. As indicated in my letter of March 19, 2004, DWR and USBR are not required to mitigate for impacts that may occur to water quality when CCWD is diverting under its CVP contract or rediverting transferred water as long as the water quality objectives will be met. This is due to the fact that USBR is the water right holder when CCWD is diverting under its CVP contract and any transferor is the water right holder when transferred water is diverted. Water use by CCWD under these circumstances occurs under a private agreement between CCWD and the parties holding the water rights. As such, CCWD is not entitled to the same protection that it is entitled to when it is diverting under its own water rights. Water quality objectives to protect beneficial uses provide protection for those uses.

In addition to the issues discussed above, South Delta Water Agency (SDWA) also raised water quality concerns associated with JPOD during consideration of the Water Level Response Plan for JPOD. The Projects responded that these concerns were more appropriately addressed in the WQRP. However, because D-1641 does not require the Projects to consult with SDWA regarding the WQRP, the Projects have not yet coordinated with SDWA to address these issues.

Based on the remaining uncertainty regarding potential water quality impacts to members of SDWA, which have not yet been addressed, this plan is only approved until August 1, 2005. This temporary approval is subject to the following terms and conditions to prevent injury to CCWD's water rights and to assess potential injury to SDWA's rights. While I have not included the two changes requested by CCWD as written, I have addressed these issues to the extent appropriate in the following conditions.

1. DWR and USBR shall meet the requirements included in the WQRP dated July 1, 2004 and shall meet the further conditions in this temporary approval. Stage 1 and Stage 2 JPOD diversions pursuant to the July 1, 2004, WQRP are authorized until August 1, 2005. JPOD diversions are not authorized pursuant to this WQRP unless the water quality objectives to protect municipal and industrial beneficial uses, agricultural beneficial uses, and fish and wildlife beneficial uses included in Tables 1, 2, and 3 of D-1641 (pages 181 through 184) are being met. Upon violation of any water quality objectives, JPOD diversions shall cease until such time as the water quality objectives are met.
2. Prior to commencing JPOD diversions during excess conditions when CCWD is authorized to divert water under its Los Vaqueros water rights, DWR and USBR shall conduct water

quality modeling to determine annual average potential changes in water quality at CCWD's intakes associated with planned JPOD diversions in comparison to conditions that would have existed under D-1485 conditions. If modeling indicates that there may be an annual average increase in chloride levels as a result of JPOD operations, DWR and USBR shall consult with CCWD to determine whether an agreement may be reached regarding JPOD diversions. If the Projects and CCWD are unable to agree on operations of JPOD, the Projects shall contact the Chief of the Division for a determination regarding required mitigation if any, for potential water quality impacts associated with JPOD diversions. In order to substantiate an allegation of potential harm, CCWD should submit detailed information concerning how the change in chloride levels would impact CCWD's operations (including potential health concerns, treatment costs, blending ability, and availability of water to meet environmental and customer demands).

3. DWR and USBR shall consult with SDWA to determine potential water quality impacts to southern Delta diverters related to Stage 1 and Stage 2 JPOD diversions. Based on that consultation, DWR and USBR shall submit a revised WQRP to the Chief of the Division prior to March 1, 2005 that addresses potential water quality impacts to SDWA's members associated with JPOD diversions.
4. This approval is based on the continuation of the facilities, Clifton Court Forebay (CCF) operational criteria, and regulatory restrictions on exports that exist as of the date of this letter. If facilities, CCF operations or export restrictions change, then DWR and USBR shall consult with the Chief of the Division to determine whether the WQRP requires changes and further approval.
5. I retain continuing authority over my approval of the WQRP for the purpose of requiring changes as needed to meet the conditions in the water rights of the DWR and the USBR on use of Stages 1 and 2 JPOD and to protect the public welfare, protect public trust uses, and prevent waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of the water involved.

With the above conditions, the proposed WQRP meets the requirements of D-1641 and is approved until August 1, 2005, subject to DWR and USBR meeting the above conditions and the commitments in the WQRP.

If any interested party objects to my decision, the interested party may submit a petition for reconsideration in accordance with Sections 768 and 769 of Title 23 of the California Code of

Chester Bowling
Carl L. Torgersen

July 28, 2004

Regulations. A petition for reconsideration must be submitted in writing within 30 days from the date of this letter to:

Mr. Arthur G. Baggett, Jr., Chair
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

If you have any questions regarding this matter, please contact Diane Riddle, Environmental Scientist, at (916) 341-5297, or Barbara Leidigh, Staff Counsel IV, at 341-5190.

Sincerely,

ORIGINAL SIGNED BY

Victoria A. Whitney
Division Chief

cc: Gregory Gartrell
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(Continued next page.)

cc: (Continuation page.)

Paul Fujitani

Chester Bowling
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July 28, 2004

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DKR:llvl 07/28/04
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Salinity, Delta Outflow and Delta Smelt Population Decline

Marianne Guerin

Greg Gartrell

Richard Denton

Contra Costa Water District

Delta Smelt and Salinity

Pelagic Organism Decline

- Improved population following 1994 Accord
 - Subsequent decline
- New operations since 1994
- Salinity regime change since 1990
- Relationship to exports levels?

Delta Smelt and Salinity

Delta smelt decline Findings

- No significant relationships with export levels
- Striking relationships with salinity levels
- Population indices are related to salinity and related hydrological parameters
- Possible factors are clams, food and habitat quality/size
- Exports may be part of the problem but not all—
solution lies with more than just exports and EWA uses
should be expanded

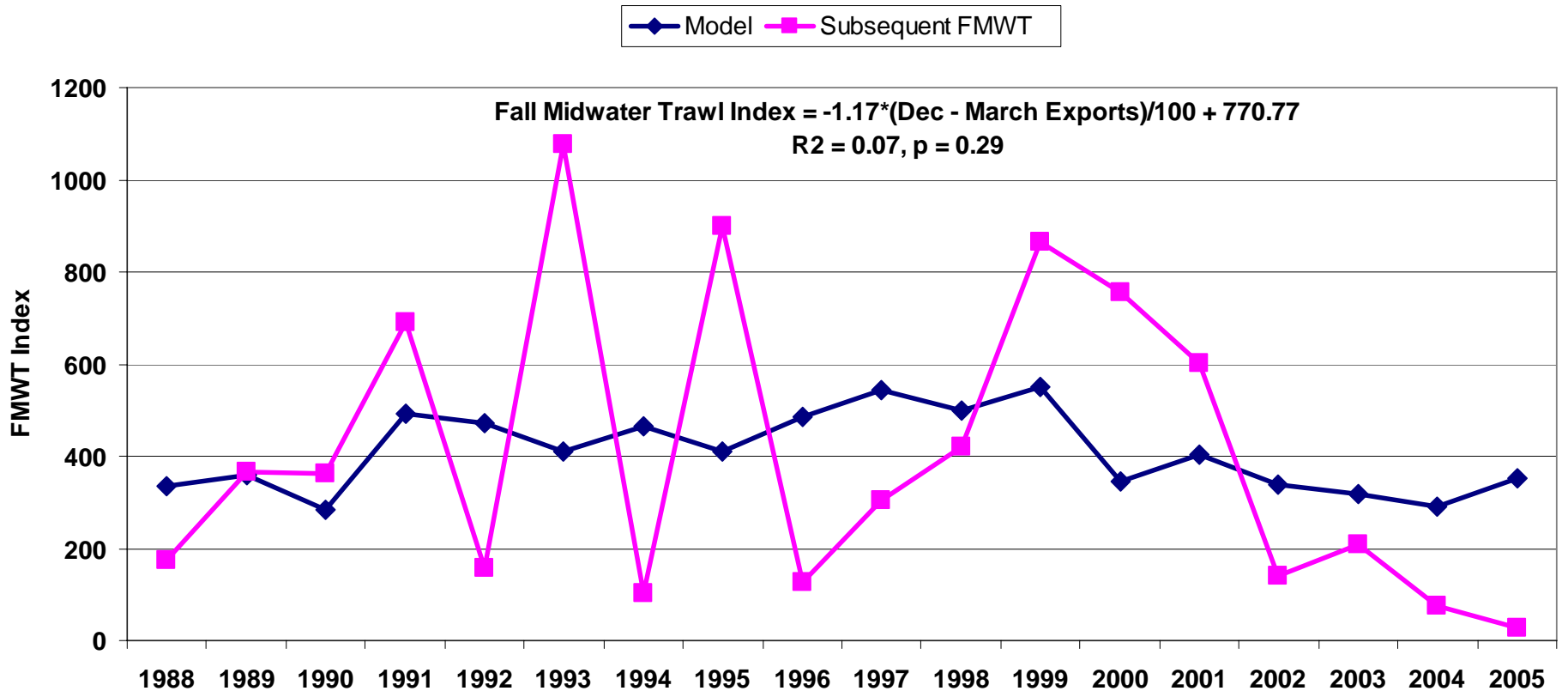
Factors considered

- Delta Smelt Abundance Indices:
 - Fall midwater trawl (FMWT)
 - Summer townet (STN)
- Exports
- Flows, salinity, clam density
- Range of time & spatial scales:
 - Decades, significant events
 - Year, season, month
 - System-wide to regional

Exports Do Not Predict Delta Smelt Abundance

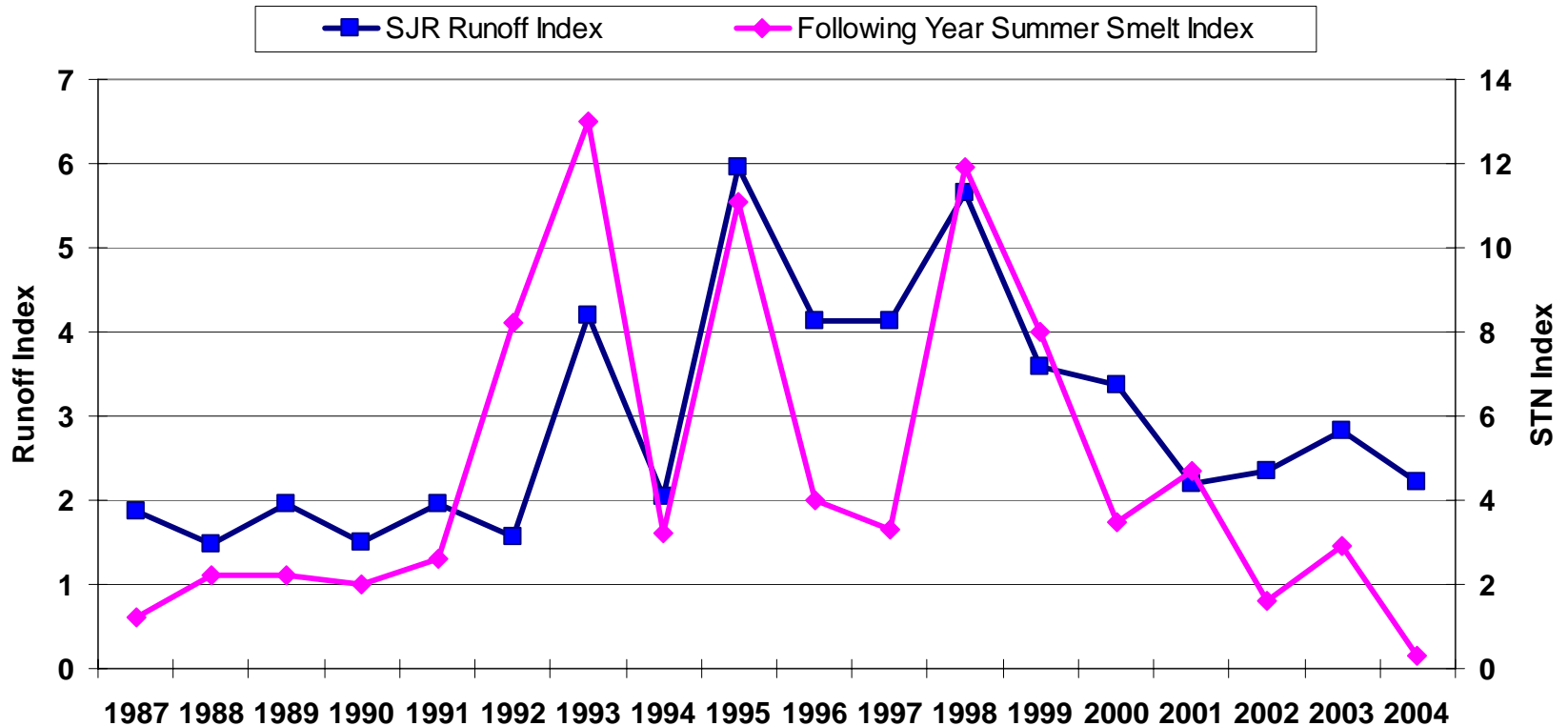
No significant relationships

Linear Regression: December - March SWP+CVP Exports Do Not Predict Subsequent Fall Delta Smelt Abundance

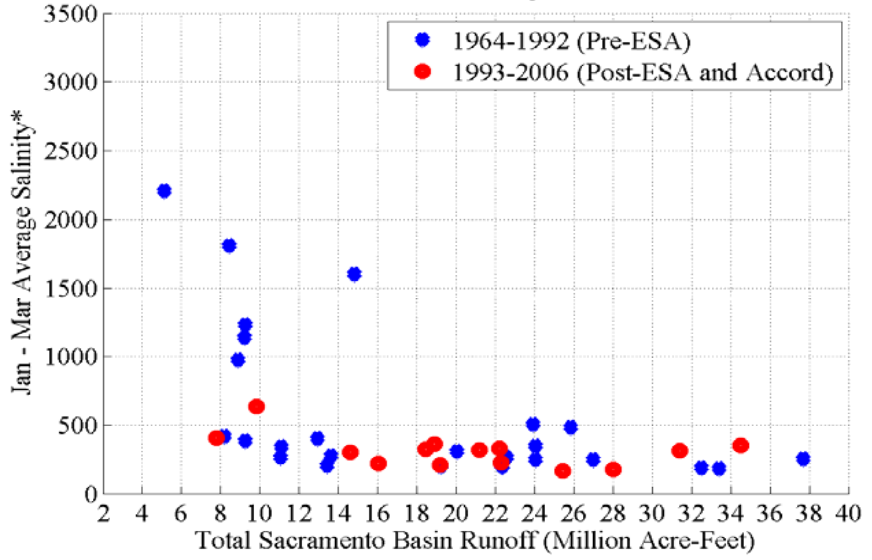


Summer Townet Index Tracks *Prior* Year Runoff Index!

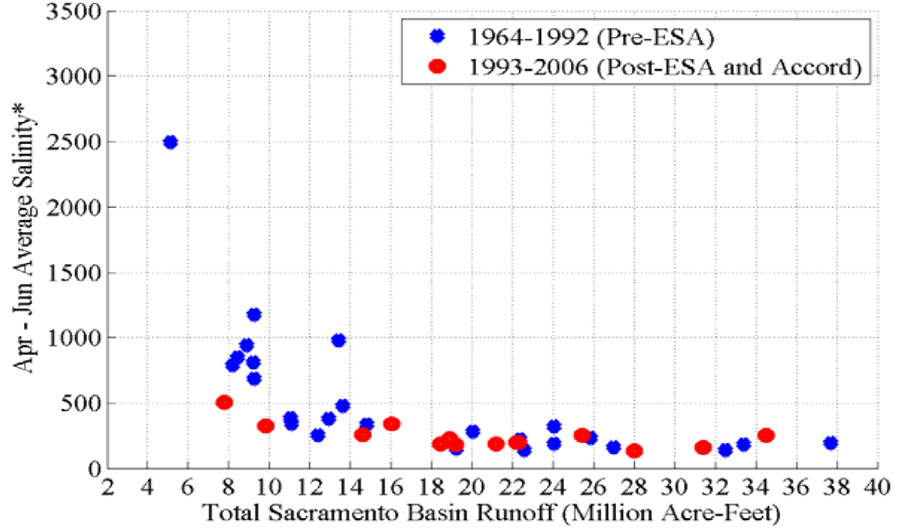
Post-Clam San Joaquin River Runoff Index and Following Year Delta Smelt Summer Townet Index (1988 - 2005)



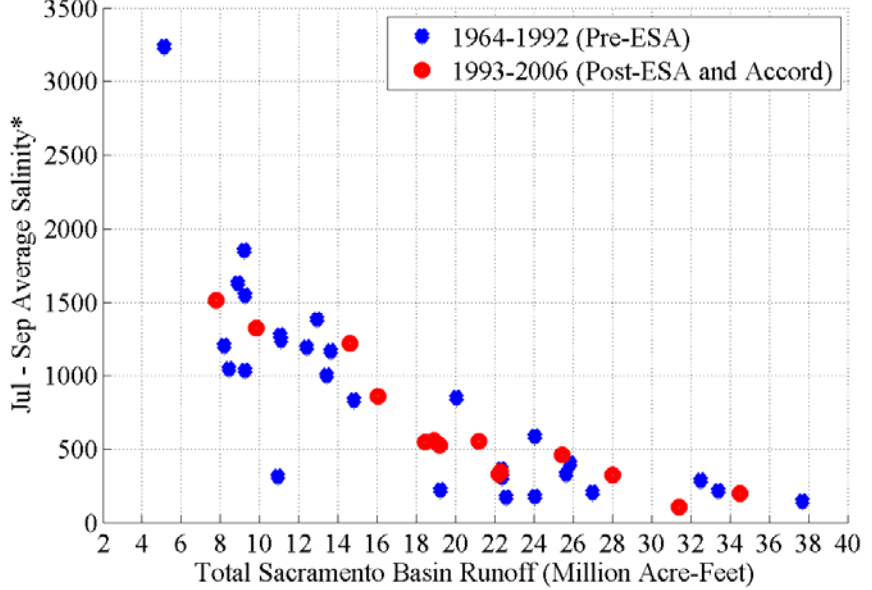
Western Delta Salinity in the Winter



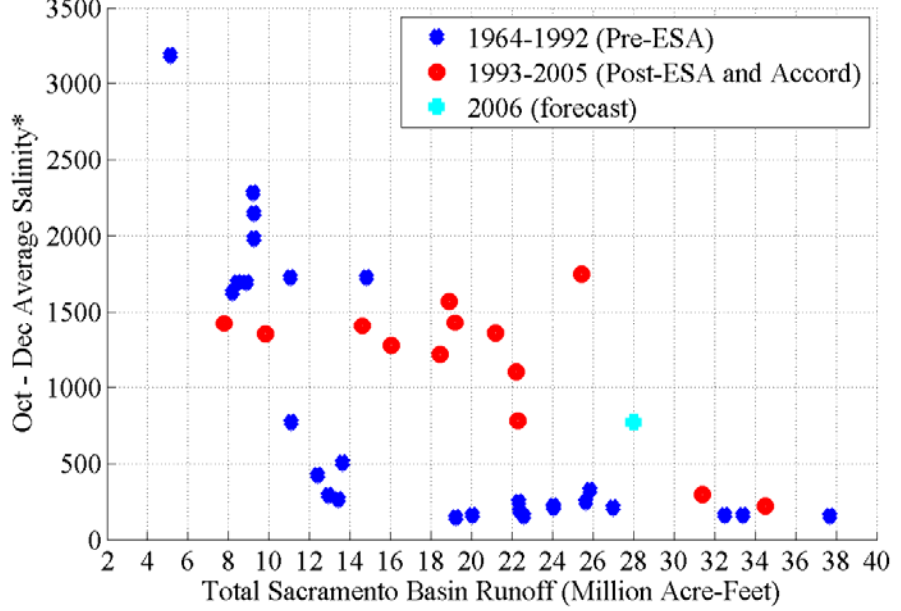
Western Delta Salinity in the Spring



Western Delta Salinity in the Summer



Western Delta Salinity in the Fall



* Salinity measured as Jersey Point electrical conductivity in microS/cm

vivaldi
27-Nov-2006

* Salinity measured as Jersey Point electrical conductivity in microS/cm

vivaldi.m
27-Nov-2006 Iso



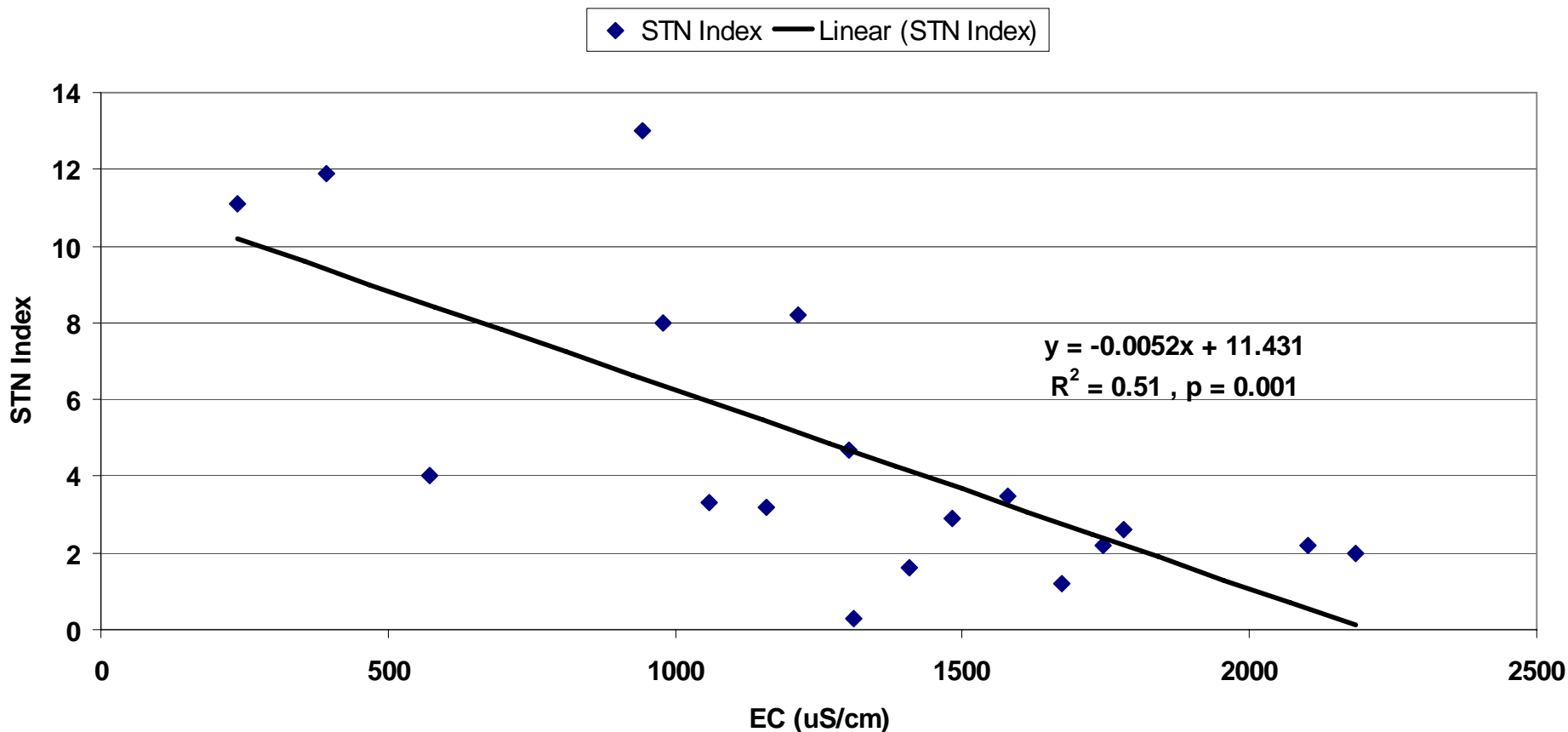
Western Delta salinity

Fall Salinity has increased since early 1990s (other seasons largely unchanged)

- Shift to summer flows for temperature control
- Rice fields flooded instead of burned
- Shift to fall pumping from spring
- Increased water use
- Decreased fall upstream flows (hydrology, diversions, power)

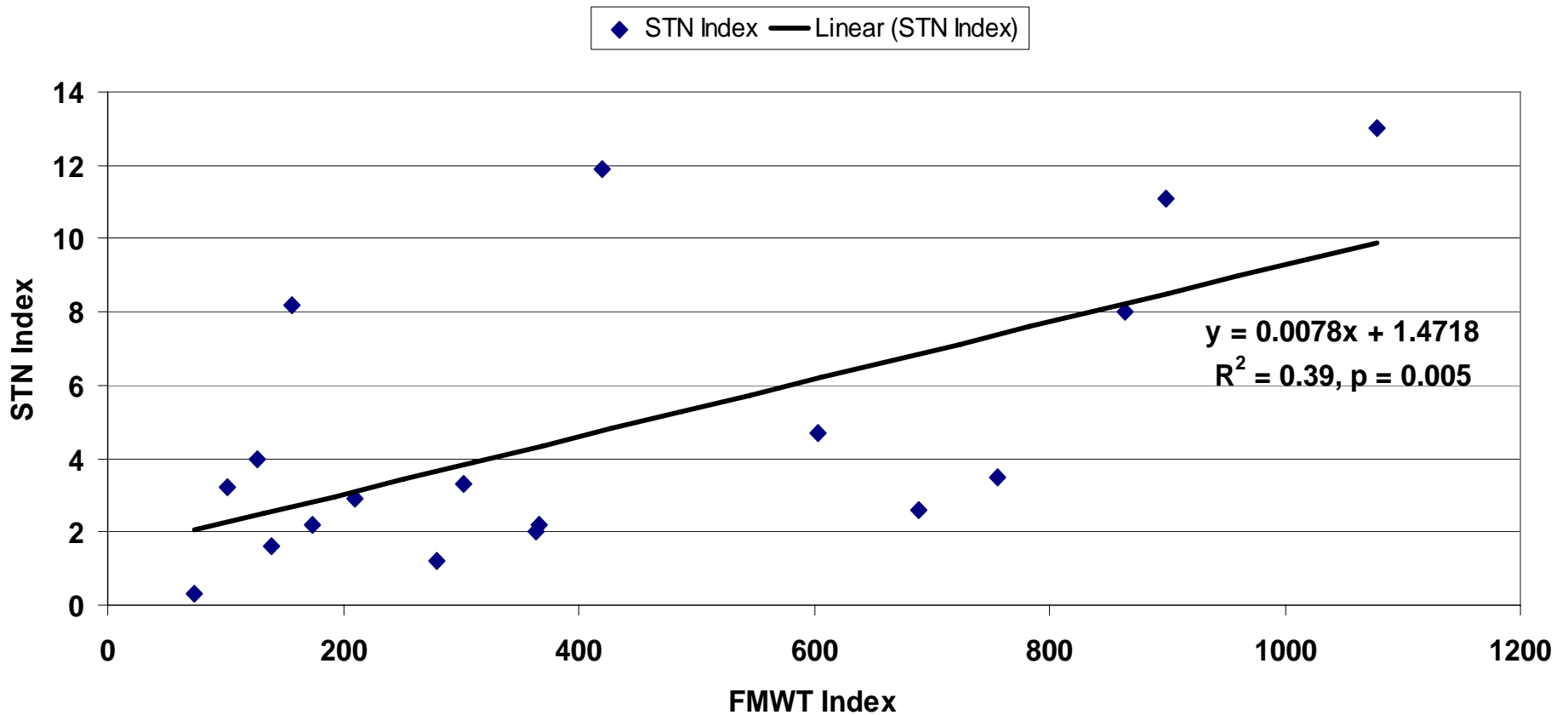
Post-Overbite Clam: Western Delta Salinity has a Very Good Correlation with Subsequent Summer Townet Index

Linear Regression: Fall Jersey Point Salinity with Subsequent Delta Smelt Summer Townet Index, 1988 - 2005: R-squared over 0.5!

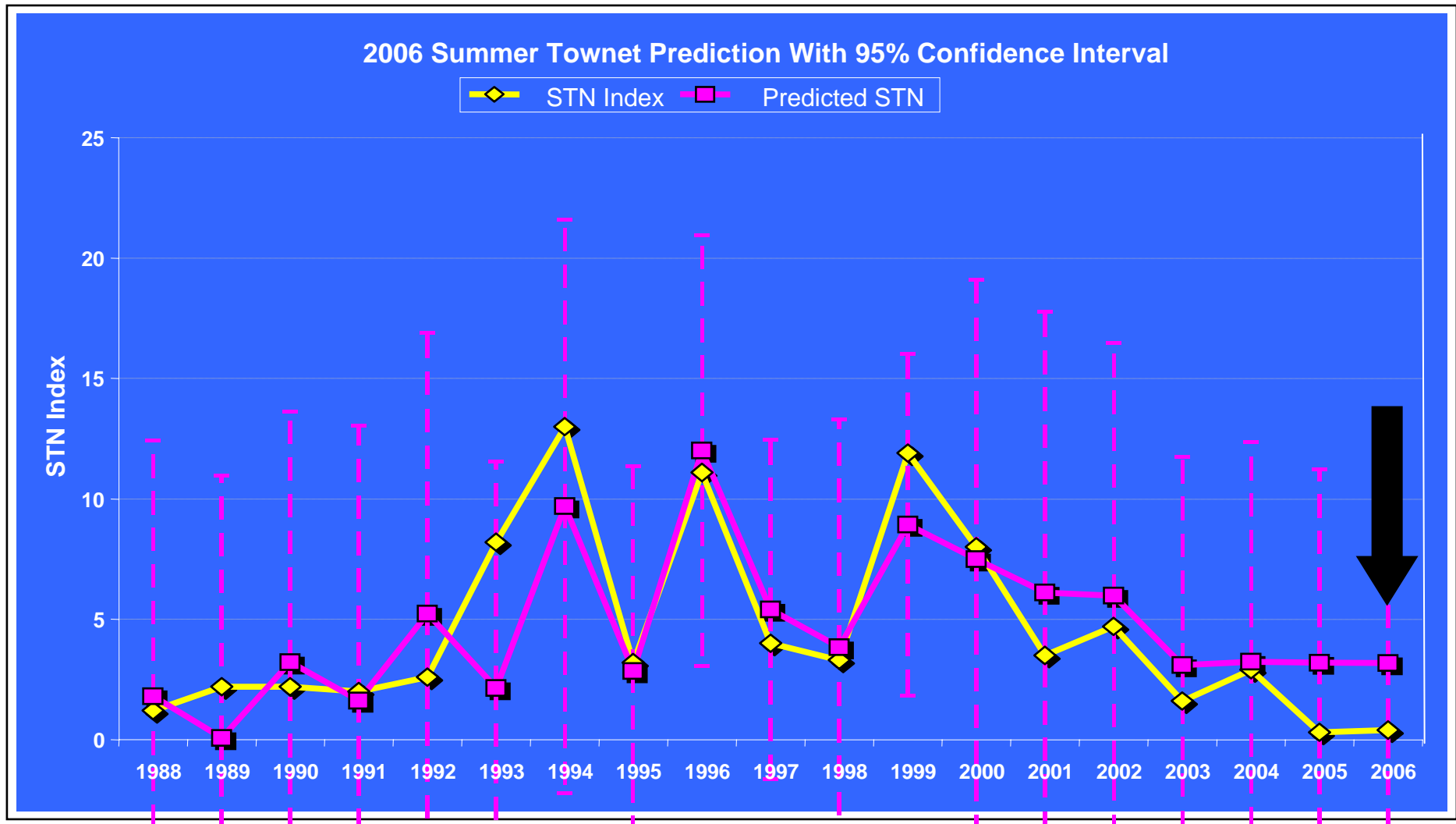


And, Summer Towntet Index Has a Good Correlation With Previous Fall Midwater Trawl Index

Delta Smelt Fall Midwater Index, 1987 - 2004, is Correlated with Subsequent Summer Towntet Index, R-squared is about 0.4!

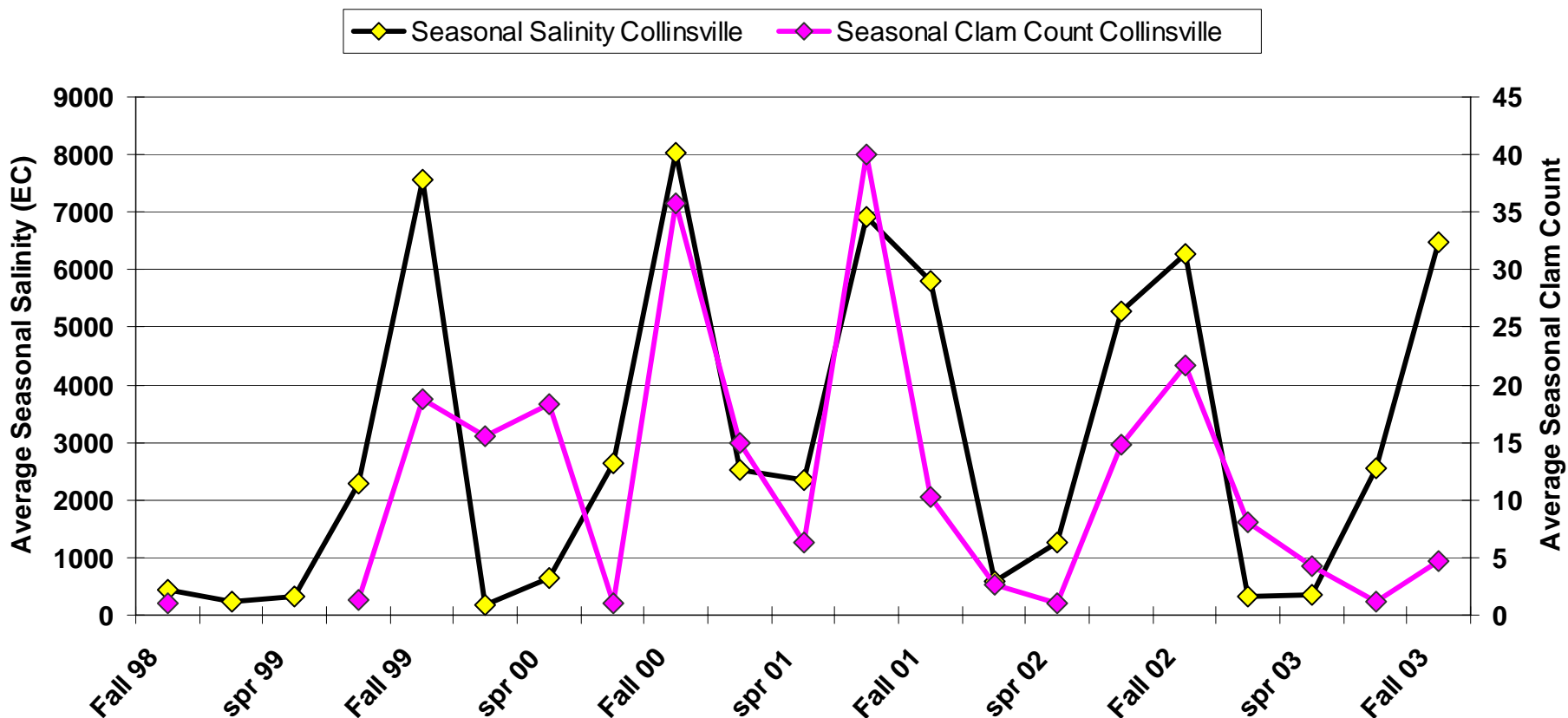


1987 – 2005, Previous FMWT and Fall Delta Salinity Relationship to Subsequent Summer Townet Index



Clam Numbers In Western Delta track Salinity!

Seasonal Clam Count and Salinity Near Collinsville, Western Delta

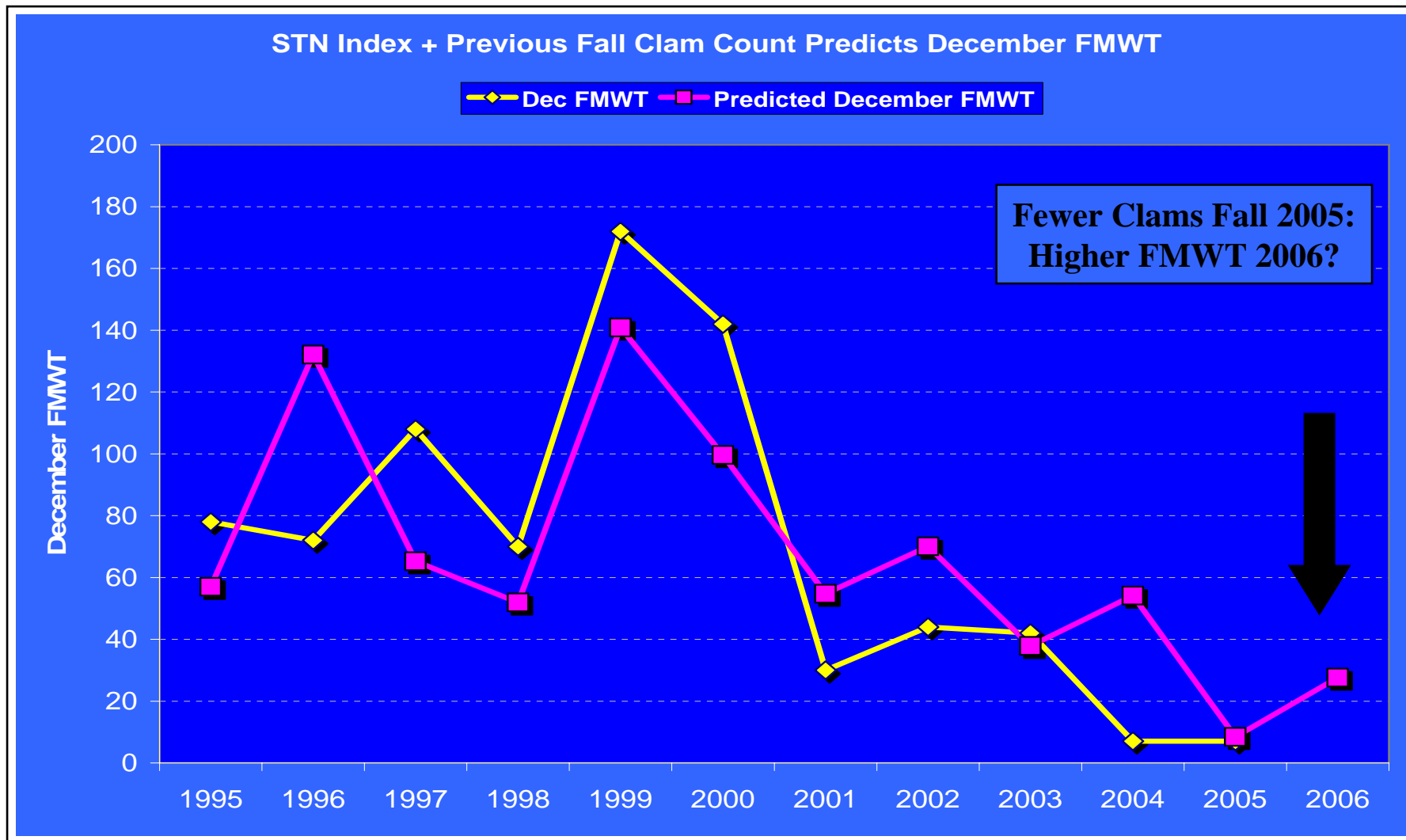


Possible Story – High Fall Salinity A Factor in Decline

- Delta salinity increases
- Overbite Clam shifts to fall recruitment
- *Food web disrupted fall, winter ?*
- *Habitat quality and size reduced in fall?*
- DWR results show Fall habitat quality declined
- Delta smelt develop gonads in fall (Bennett, 2005)
 - *Reproduction suffers ?*
 - *Result is lower STN Index ?*
- *Reduced or poor habitat results in greater susceptibility to other factors (toxics, exports)?*

STN Index + Prior Clam Count tracks Dec. FMWT

$$r^2=0.56, p = 0.009$$



Significant Correlations

- *Salinity and runoff index are related*
 - *(fall regime has changed since early 1990's)*
- *Clam biomass/numbers and salinity are related*
- *FMWT and subsequent STN and spring salvage are all related*
 - *(high adult population in the fall results in high spring salvage and high summer population)*
- *STN related to prior year runoff index*
- *STN strongly related to prior fall salinity*
- *STN related to prior fall salinity/ FMWT (!)*
- *FMWT related to prior STN / clam density (!)*

Summary:

- Western Delta salinity:
 - Fall Salinity has increased since 1990's
 - Other Seasons largely unchanged
- Delta smelt numbers correlated with salinity
 - Clams and Salinity strongly related
 - Fall salinity /FMWT index related to STN index
 - STN index/Clams related to December FMWT
- Export relationship is not significant
- Use EWA for salinity control, not just exports