**From:** Wendy Chriss <wchriss@ccwater.com>
**Sent:** Friday, October 30, 2015 11:37 AM
**To:** BDCPcomments
**Subject:** 2015 RDEIR/SDEIS for the proposed BDCP / California WaterFix
**Attachments:** CCWDComments_BDCP_2015-10-30.pdf; CCWDComments_BDCP_2015-10-30 _exhibits.ZIP

Contra Costa Water District's comments on the 2015 RDEIR/SDEIS for the proposed BDCP / California WaterFix are attached. Please acknowledge receipt of these comments. Thank you

Wendy Chriss | Administrative Secretary
**Contra Costa Water District**
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October 30, 2015

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**VIA EMAIL**

BDCP/WaterFix Comments
P.O. Box 1919, Sacramento, CA 95812
BDCPComments@icfi.com

**Re: Partially Recirculated Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) for the Bay Delta Conservation Plan/WaterFix**

Please find enclosed comments by the Contra Costa Water District on the RDEIR/SDEIS for the proposed BDCP/WaterFix project. In addition to the attached comments on the 2015 RDEIR/SDEIS, our prior comments dated July 25, 2014 on the 2013 BDCP Draft Environmental Impact Report/Environmental Impact Statement still apply to the environmental analysis of the proposed BDCP/WaterFix. These prior comments should be included in the administrative record for this matter and should be carefully reviewed by appropriate agency staff and the decision-makers as the environmental review process moves forward.

The environmental review for the proposed BDCP/WaterFix lacks definition and analysis of many key aspects of the project, including how the project will be operated and how it will be integrated with the statewide water supply system. The RDEIR/SDEIS indicates that some of these issues will be decided during the consultation process for the project pursuant to Section 7 of the federal Endangered Species Act. We understand that modeling has been conducted as part of that consultation process, and we request that those model runs and any future runs that are done for the Section 7 consultation be provided to CCWD and other interested stakeholders. This will ensure that public participation and input on the BDCP/WaterFix are fully informed and meaningful.

To further promote meaningful public participation and informed decision-making and meet the fundamental purposes of CEQA and NEPA, we strongly encourage the California Department of Water Resources and the Bureau of Reclamation to incorporate the necessary revisions to the RDEIR/SDEIS analysis, as indicated in our attached comments, and recirculate the document.

We appreciate your consideration of CCWD's comments in this matter. If you have any questions, please call Marguerite Patil at CCWD at (925) 688-8018 or email her at mpatil@ccwater.com.

Sincerely,

Barbara J. Schussman

Attachments

Electronic copies to: Mark Cowin, California Department of Water Resources
David Murillo, U.S. Bureau of Reclamation

# Contra Costa Water District

Comments on the July 2015

Bay Delta Conservation Plan / California WaterFix

Partially Recirculated Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement

October 30, 2015

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# Contra Costa Water District
# Comments on the July 2015 RDEIR/SDEIS for the
# Proposed Bay Delta Conservation Plan / California WaterFix

## Sections



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Contra Costa Water District

Comments on the July 2015 RDEIR/SDEIS for the

Proposed Bay Delta Conservation Plan / California WaterFix

# 1. Executive Summary

Contra Costa Water District (CCWD) serves 500,000 people in Contra Costa County with water diverted at its four drinking water intakes in the San Francisco-San Joaquin Delta (Delta). The environmental analysis in the Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) for the proposed Bay Delta Conservation Plan/California WaterFix (BDCP/CWF) is flawed in ways that obscure and underestimate the potentially significant impacts of the proposed project on Delta water quality at CCWD's intakes.

In particular, the environmental analysis obscures and underestimates Delta water quality impacts in the following ways:

- The project description lacks vital information, making it impossible to determine whether the full range of potential impacts has been evaluated.
- The analysis does not adequately evaluate the impacts of the new alternatives (including Alternative 4A, the new Preferred Alternative) beyond 2025, resulting in a failure to inform the decision-makers and the public of the proposed project's long-term effects.
- The analysis improperly conflates project impacts with the separate and distinct effects of climate change, thereby obscuring the impacts that are attributable to the proposed BDCP/CWF.
- The environmental analysis is based on modeling that does not accurately portray either the baseline conditions or the elements of the proposed BDCP/CWF, which results in significantly understating the project's impacts. There are numerous flaws in the modeling used for the environmental analysis, including the following:
    - The CEQA baseline overestimates existing Delta salinity, which results in understating the salinity impacts that would be caused by the proposed project.
    - The impact analysis for the new Preferred Alternative (Alternative 4A) is based on modeling conducted for the former Preferred Alternative (Alternative 4), despite significant differences in project components and operations. The failure to use modeling that actually represents the project that is being proposed for approval results in a further underestimation of environmental impacts.

- The RDEIR/SDEIS presents sensitivity studies to support use of the old modeling from the 2013 BDCP Draft EIR/EIS for the newly presented alternatives, but these studies do not provide credible evidence that the impacts of the new alternatives have been adequately disclosed and evaluated. To the contrary, the studies reveal water quality impacts that have not been revealed in the RDEIR/SDEIS.

- The modeling could not simulate a set of conditions in the project description that is physically impossible to achieve: namely, simultaneous closure of a barrier at the head of Old River and northward net flow in Old and Middle Rivers. The resulting workaround in the modeling leads to a significant underestimation of the potential water quality impacts of the barrier operations.

Water quality mitigation measures are inadequate, both for impacts found to be significant and for impacts that should have been identified as significant but were underestimated and found to be less than significant due to flaws in the analysis.

This letter addresses two further issues with the RDEIR/SDEIS analysis in addition to CCWD's water quality concerns:

- The change in the project objectives, which eliminated the goal of having the proposed project serve as a habitat conservation plan and natural community conservation plan (HCP/NCCP), should have triggered a reevaluation of alternatives previously eliminated from detailed consideration on the ground that they did not meet the original project objectives. The "Portfolio" alternative, which has been recommended by a broad range of water districts, municipalities, environmental organizations, business groups, and elected officials, was previously eliminated from detailed consideration as beyond the scope of an HCP/NCCP. Now that the project is no longer proposed as an HCP/NCCP, the Portfolio alternative must be reconsidered.

- The analyses are presented in the RDEIR/SDEIS in a confusing manner that does not allow the reader to readily understand the analyses themselves or the environmental findings. As a result, the document fails to provide information that will be meaningful and useful to the decision-makers and the public.

These flaws must be fixed in a revised environmental analysis. Given the number and magnitude of the flaws, and of the revisions needed to address them, this revised analysis must be recirculated for another round of public review and comment. Otherwise, the fundamental goals of CEQA and NEPA – which are designed to ensure that the environmental impacts of a proposed project are accurately disclosed, adequately evaluated, and properly mitigated, so that the decision-makers and the public can meaningfully weigh the project's benefits against its impacts – will not be achieved.

# 2. Introduction

This introduction summarizes the following sections of these comments, which explain each major flaw in the RDEIR/SDEIS.

**Section 3: The Project Description Is Incomplete and Impedes an Adequate Impact Analysis**

The RDEIR/SDEIS analysis of impacts to water supply, surface water, water quality, and aquatic resources relies upon quantitative modeling tools to predict how the Department of Water Resources (DWR) and Bureau of Reclamation (Reclamation) will jointly operate the State Water Project (SWP) and Central Valley Project (CVP) to manage the statewide water supply system under varying hydrological and environmental conditions, consistent with the applicable regulatory requirements. Figure 2-1 provides a schematic illustration of the impacts assessment framework.

To use these modeling tools effectively to assess impacts from the proposed BDCP/CWF, a complete and accurate project description is required. This includes the criteria for operating new water conveyance facilities and a description of how operation of existing facilities will be modified (i.e., how the facilities will be "reoperated") to integrate the new facilities into the statewide water supply system. However, as the RDEIR/SDEIS acknowledges, the models do not accurately reflect the physical elements of the new alternatives (including Alternative 4A, the new Preferred Alternative) and are not based on a clear and complete plan for how these alternatives would be operated. The result is an insufficient project description, which precludes an adequate impact analysis. The following examples illustrate this problem:

- The determination of initial operating criteria for Alternative 4A, the new Preferred Alternative, is deferred until the future permitting process when the Lead Agencies will consult with the National Marine Fisheries Service (NMFS), the U.S. Fish & Wildlife Service (USFWS), and the California Department of Fish & Wildlife (CDFW) regarding the effects of the project on listed species. Identifying the sources of water to meet the proposed flow criteria for Alternative 4A is also deferred. Yet this information is critical to analyzing the impacts of the project on water supply, surface water, water quality and aquatic resources. Without this information, the conclusions in the RDEIR/SDEIS are suspect. This deficiency is further evaluated in Section 3.1.

- The project descriptions for revised Alternative 4 and new Alternative 4A do include some operating criteria, although they fall well short of complete and adequate operations plans. However, key operating criteria are internally inconsistent. For example, the project descriptions include a requirement for net positive flow in Old and Middle River at times when the Head of Old River Barrier is closed, which is not physically possible. This inconsistency calls the credibility of the modeling results into serious question and is discussed in Section 3.2.

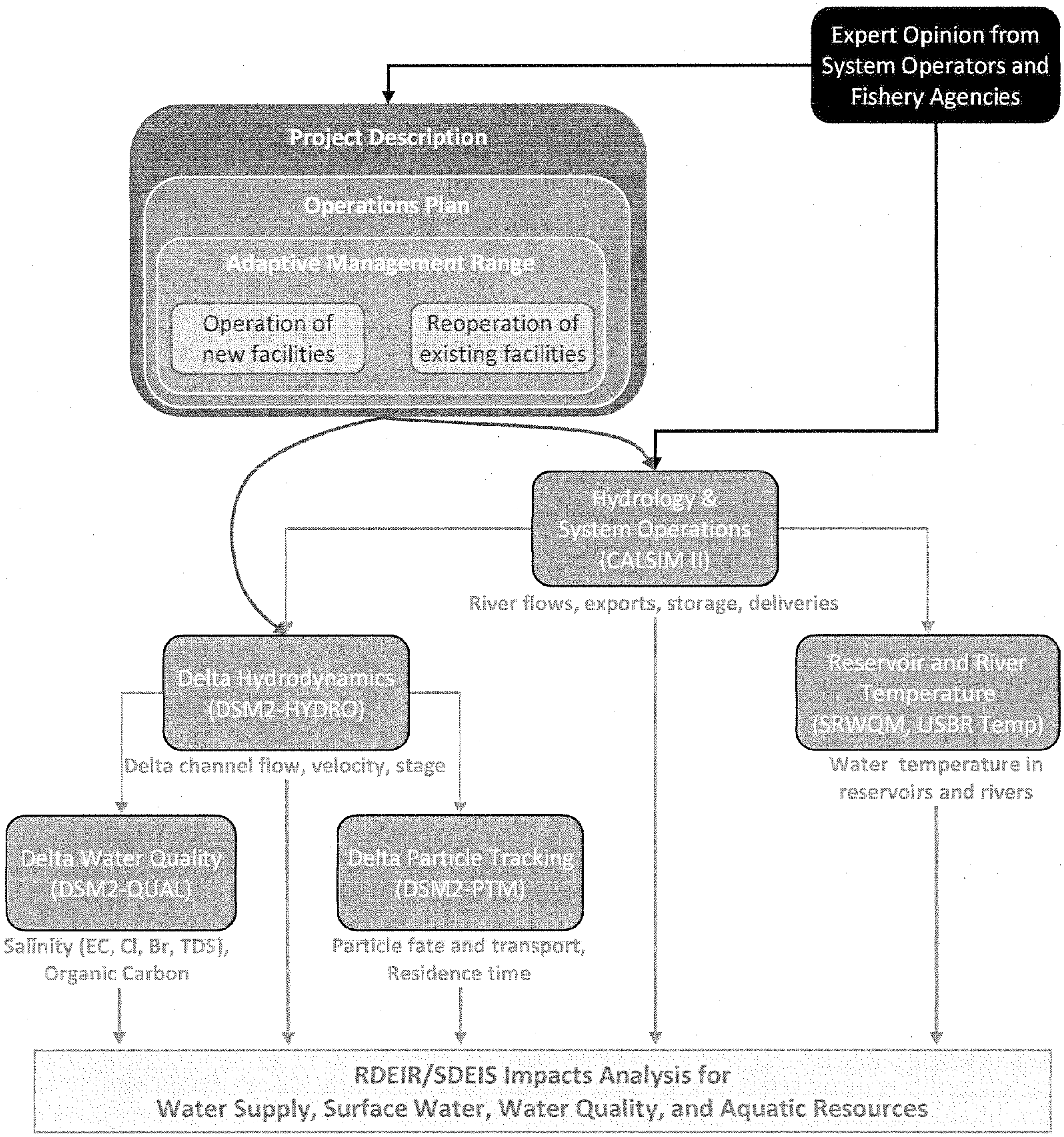



**Figure 2-1. Analytical Framework Used to Evaluate Environmental Impacts**
Adapted from 2013 BDCP Draft EIR/EIS, Appendix 5A, Section A, Figure A-1, by adding the expert knowledge and project description upon which the models rely.

- The lack of a complete and adequate operations plan results in unrealistic assumptions that skew the impact analyses. For example, the modeling for Alternative 4A assumes unrealistic excess Delta outflow, which results in the prediction of better Delta water quality than would actually occur. The excess outflow is based on assumed project operations that differ significantly from the current practice of the CVP and SWP, and that are contrary to the interests of the Lead Agencies. In the absence of an operations plan that sets forth a reasoned, strategic basis for taking actions that are detrimental to the interests of the project proponents, there is no basis for relying on this assumption of excess Delta outflow for purposes of the impact analysis. This problem is explained in Section 3.3.

**Section 4: The Early Long Term Analysis for the New Alternatives Does Not Adequately Evaluate and Disclose the Project's Impacts**

The impact analysis for the new alternatives presented in the RDEIR/SDEIS is based on "Early Long Term" (ELT) conditions that are projected to occur in the year 2025. This ELT analysis suffers from two significant deficiencies:

- By focusing on the year 2025 – which is less than ten years after any project approval, and at around the same time as the completion of construction and the onset of most of the project's operational impacts – the RDEIR/SDEIS fails to present an adequate evaluation of the project's long-term impacts. This inadequacy is detailed in Section 4.1.

- Under the Early Long Term approach, the CEQA analysis compares impacts in the year 2025 to the 2009 existing conditions baseline, without distinguishing between the 2025 effects of implementing the project from the separate and independent effects caused in that year by sea level rise, climate change and future water demands. This has the result of obscuring the impacts that are specifically attributable to the project as well as the mitigation measures needed to address those impacts. This deficiency is further evaluated in Section 4.2.

**Section 5: The Modeling Used in the RDEIR/SDEIS Does Not Accurately Portray Either the Actual Baseline Conditions or the Elements of the Proposed Project, Resulting in an Analysis that Obscures and Underestimates Impacts**

As explained above, proper quantitative modeling is crucially important to assess the impacts of the proposed BDCP/CWF. But the modeling used for the RDEIR/SDEIS is deficient in a number of key respects. As a result of these deficiencies, the RDEIR/SDEIS does not provide a clear, complete or accurate picture of the project's significant adverse impacts. Some examples of the deficient modeling are as follows:

- The modeling used in the impact analysis does not accurately portray either the baseline conditions or the descriptions of the new alternatives in the RDEIR/SDEIS. For example, the modeling for the new alternatives includes 25,000 acres of tidal marsh restoration, but according to the RDEIR/SDEIS the three new alternatives actually include only 55-65 acres of tidal marsh restoration. The large scale tidal marsh restoration in the modeling has the effect of reducing salinity in the western Delta, which in turn masks the real effect of the alternatives on Delta salinity. This and other examples of modeling flaws in the water quality analysis are discussed in Section 5.1.

- To support the Lead Agencies' decision to use modeling from the 2013 BDCP Draft EIR/EIS to evaluate impacts of the new alternatives, two sensitivity analyses are presented in the RDEIR/SDEIS. However, neither of the sensitivity analyses provides credible evidence that the old modeling adequately identifies the impacts of the new alternatives. In fact, additional impacts are revealed in the sensitivity analyses that are not included in the RDEIR/SDEIS, such as increases in Delta salinity in fall and winter. Section 5.2 explains why the sensitivity studies fail to support the flawed conclusions in the RDEIR/SDEIS.

- Two important elements of the project description, the operation of the Head of Old River Barrier (HORB) and south Delta flow requirements, are internally inconsistent. In particular, according to the project description, there will be positive net flows in Old and Middle River at a time when the HORB is closed. But this is not physically possible, and the quantitative models used in the impact analysis cannot be configured to meet both of these conditions. To enable the model to work, the Lead Agencies included an assumption that the HORB would be partially open when the project description indicates that the HORB would be completely closed. With this new assumption, the model projects better water quality than would actually occur with the HORB closed as described. CCWD conducted its own sensitivity analysis to evaluate the degree to which this problem in the RDEIR/SDEIS impact analysis results in underestimating the project's negative water quality effects. CCWD's analysis of this issue is presented in Section 5.3.

**Section 6: The Mitigation in the RDEIR/SDEIS Is Inadequate**

One of the key objectives of conducting an environmental review is to identify the mitigation measures that are needed to eliminate or substantially reduce a project's potentially significant impacts. But the RDEIR/SDEIS fails to achieve this objective, as the mitigation for water quality impacts suffers from two important flaws, as described in Section 6 of these comments:

- First, significant impacts that should be mitigated have, through flawed analyses, been underestimated, obscured and erroneously identified as less than significant, with the result that no mitigation has been included for those impacts.

- Second, the only water quality mitigation measures (WQ-11a and WQ-11b) that have been proposed for the new alternatives, including Alternative 4A, do not include measureable performance standards and are therefore inadequate.

**Section 7: Alternatives Previously Eliminated from Detailed Consideration Need to be Reevaluated Given the Change in Project Objectives**

The project objectives are an important factor in defining the reasonable range of alternatives that must be examined. Here, the original project objectives included designing the BDCP as a habitat conservation plan under the federal Endangered Species Act and a natural community conservation plan under California law (the Natural Community Conservation Planning Act or NCCPA). The environmental analysis conducted in 2013 explained that while the "Portfolio" alternative had much merit, this alternative was eliminated from detailed consideration on the ground that it was beyond the scope of an HCP/NCCP. But now that the objective of having the project serve as an HCP/NCCP has been abandoned, the Lead Agencies need to reevaluate the alternatives that were previously screened out from the analysis. This issue is addressed in Section 7 below.

**Section 8: The Presentation of Information in the RDEIR/SDEIS Is Highly Confusing, Precluding Informed Decision-Making and Meaningful Public Participation**

Both CEQA and NEPA instruct that environmental analyses should be clearly presented so that they can be readily understood. The RDEIR/SDEIS fails to adhere to this instruction. The presentation of information in the RDEIR/SDEIS is convoluted and confusing, and the Executive Summary – the only part of this lengthy document that many are likely to read – often contradicts the actual impact analysis in the body of the document, repeatedly identifying as less than significant impacts that the document's environmental analysis acknowledges are significant. These defects thwart the important goal of adequately informing the decision-makers and public about the project and its adverse environmental impacts so that they can meaningfully weigh the project's benefits against its detriments.

* * * * *

Any one of these flaws standing alone would require revision and recirculation of the environmental analysis. Taken together, the various flaws in the RDEIR/SDEIS point to a critical need to revisit the environmental analysis, to ensure that the project's adverse impacts are thoroughly and accurately disclosed, adequately evaluated, and properly mitigated.

# 3. The Project Description Is Incomplete and Impedes an Adequate Impact Analysis

The project description lacks vital information, making it impossible to determine whether the full range of potential impacts has been evaluated.

A complete and finite project description is the basis of a legally adequate EIR/EIS. As discussed in Section 1 of CCWD's July 25, 2014 comment letter in this matter, the project description in the 2013 BDCP Draft EIR/EIS omits critically important information, precluding an accurate and thorough environmental assessment. These defects remain in the 2015 RDEIR/SDEIS, and the revised environmental analysis in the document gives rise to three additional flaws:

- First, the new Preferred Alternative, Alternative 4A, improperly defers the determination of criteria that will govern the operation of the project until after the public review of the environmental analysis.
- Second, the operational criteria for the south Delta facilities and the proposed Head of Old River Barrier are internally inconsistent and cannot be implemented as described.
- Third, by failing to describe how existing SWP and CVP facilities would operate in coordination with the proposed new water conveyance facilities of the BDCP/CWF, the revised analysis relies upon modeling results that include unrealistic assumptions that obscure and underestimate impacts.

Each of these flaws is described separately in the sections that follow.

## *3.1. Operational Criteria for the New Preferred Alternative Are Improperly Deferred*

The lack of information about the proposed project's initial operating criteria and the range of operational adjustments and adaptive management makes it impossible to determine whether the analysis presented in the RDEIR/SDEIS captures the full range of potential project impacts.

The determination of initial operating criteria for Alternative 4A, the new Preferred Alternative, is deferred until the future permitting process when the Lead Agencies will consult with the federal and state fishery agencies (NMFS, USFWS and CDFW) regarding the project's effects on listed species. RDEIR/SDEIS, Executive Summary at p. ES-21 and Section 4.1.2.2 at p. 4.1-5.

As illustrated in Figure 2-1, consultation with the fishery agencies is a necessary step to define criteria for operation of the project. At the same time, a defined set of operating criteria is necessary for a complete and accurate project description, which in turn is necessary for a complete and accurate evaluation of the environmental effects of the project. Further, an open and public review of the operating criteria, and of how these criteria affect the analysis of environmental impacts, is a critical part of the CEQA and NEPA review process.

But under DWR's schedule for project review and permitting, the operating criteria will not be determined until after the public review and comment period on the RDEIR/SDEIS has closed. According to DWR's Office of the Chief Counsel, consultation with the fishery agencies is occurring during the CEQA review; the Lead Agencies anticipate the following schedule:

- Final EIR/EIS completed in May-June 2016.
- USFWS and NMFS biological opinions issued in April-June 2016.
- CDFW permit issued after DWR completes the CEQA process.

(Bogdan, K.M., 2015)

This schedule does not allow for adequate analysis of the project's effects, or for a meaningful public review of that analysis, once the operational criteria are determined. The operational criteria are an integral piece of the project description that is necessary for an adequate evaluation of the environmental impacts to water supply, surface water, water quality, and aquatic resources. Modifications to the assumed operational criteria will modify the resulting impacts.

The Lead Agencies cannot rely on the future permitting process to fill in gaps in their own environmental analysis. The permitting agencies will require conditions and mitigation consistent with their statutory responsibilities, but these agencies will not consider the potentially significant impacts caused by these permit conditions and mitigation on environmental resources that are outside their regulatory purview. Thus, the fisheries permitting process has a much narrower focus than the Lead Agencies' obligations under NEPA and CEQA, which require a complete analysis of ***all*** of the project's impacts on the environment.

As a result, the environmental analysis in the RDEIR/SDEIS must be revised to define the full range of possible operating criteria that may result from the permit process in order to bracket the full range of potential project impacts, or alternatively, this environmental analysis must be revised once the operational criteria have been determined. And in either case, the revised analysis must be recirculated for public review and comment.

Another problem is that the RDEIR/SDEIS defers the determination of the source of water to meet proposed flow criteria for the new Preferred Alternative, Alternative 4A. As discussed in CCWD's July 25, 2014 comment letter on the 2013 BDCP Draft EIR/EIS, failure to disclose the source of the water omits an important element of the project description and results in an inadequate environmental analysis. The RDEIR/SDEIS suffers from the same deficiencies described in Section 1.1.5 of CCWD's July 25, 2014 comment letter. Further, the RDEIR/SDEIS compounds the problem by stating that if sufficient water transfers from willing sellers cannot be identified to meet the spring Delta outflow criteria, "the spring outflow criteria will be accomplished through operations of the SWP and CVP to the extent an obligation is imposed on either the SWP or CVP under federal or applicable state law." RDEIR/SDEIS, Section 4.1.2.2 at p. 4.1-6. This implies that a key element of the project description is dependent on yet-to-be-determined legal obligations. The end result is that the RDEIR/SDEIS fails to present the full range of impacts that may result from the future determination of this key project element.

In sum, the RDEIR/SDEIS must be revised to provide a complete and accurate project description, and to provide a full and adequate impact analysis based on that project description, so that decision-makers and the public can understand the true extent of the project's potential adverse effects on water quality, water supply and other environmental resources.

### *3.2. Operational Criteria for the New Preferred Alternative Are Internally Inconsistent*

The description of the revised Alternative 4 and new Alternative 4A includes requirements for positive net flows in Old and Middle Rivers at times when the Head of Old River Barrier (HORB) is closed, although positive net flows are not physically possible when the barrier is closed. The hydrodynamic and water quality modeling, which is based upon numerical formulations of real-world physical processes, thus cannot match the unrealistic project description. As discussed in Section 5.3 below, this inconsistency results in an inadequate and inconsistent project description and an insufficient evaluation of the project's water quality impacts.

Old River and Middle River are natural distributaries of the San Joaquin River. Figure 3-1 shows the head of Old River where Old River branches off from the San Joaquin River near Lathrop in the South Delta. Downstream of the head of Old River, Middle River branches off from Old River. Water entering the Delta via the San Joaquin River (orange arrows on Figure 3-1) would naturally split at the head of Old River junction, feeding a northerly flow into Old and Middle Rivers; this is the only source of northerly net flow in Old and Middle Rivers (OMR). Net southerly flow in Old and Middle Rivers is caused by water diversions at intakes located south of the flow gages on Old and Middle Rivers. The CVP and SWP pumping plants in the south Delta (Jones and Banks, respectively) are the dominant cause of net southerly flow. Northerly net flow is positive OMR, while southerly net flow is negative OMR.

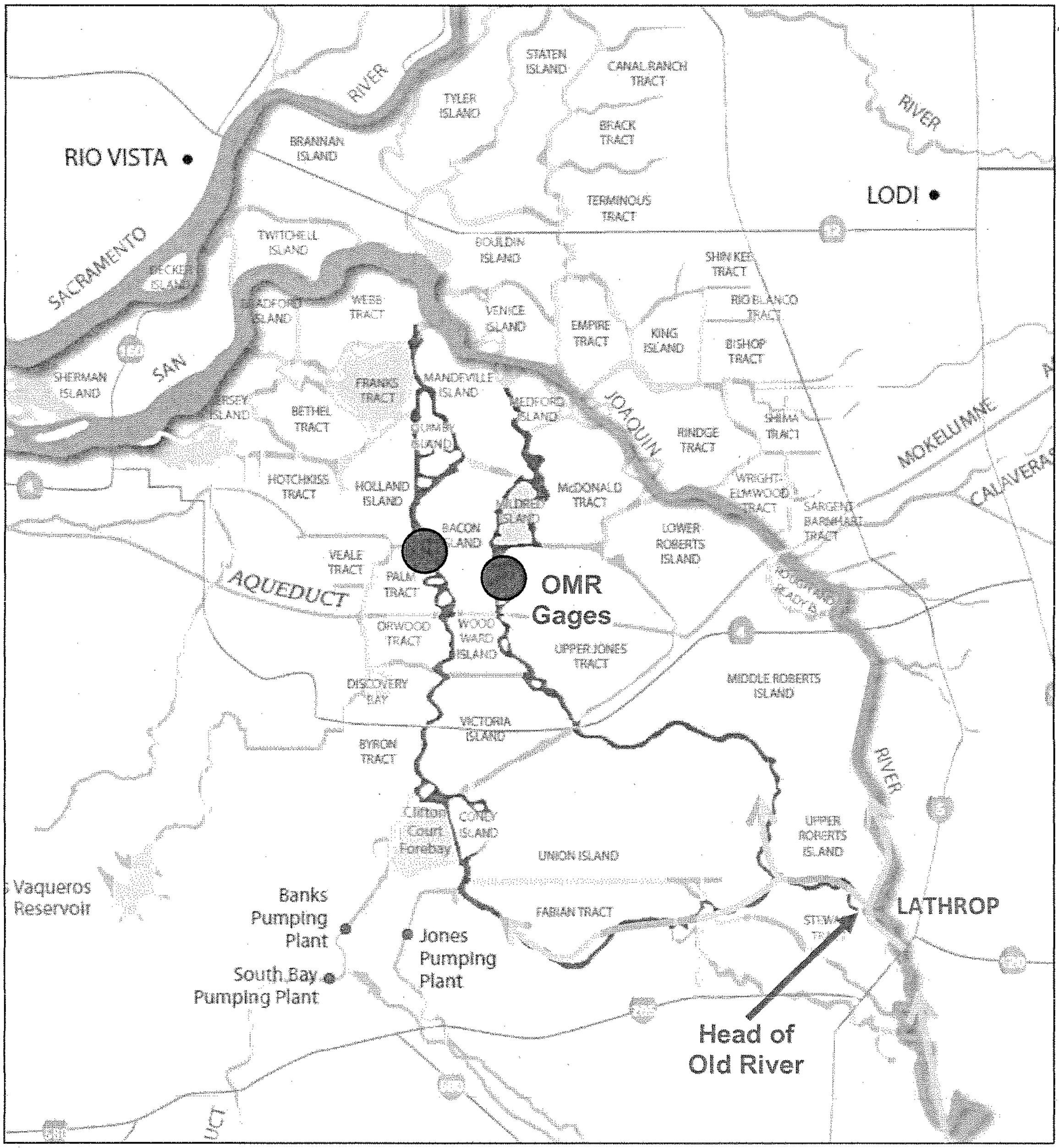



**Figure 3-1. Regional map of the South Delta**

The San Joaquin River bifurcates at the head of Old River, splitting flow between the San Joaquin River and Old River. Old River subsequently bifurcates into Old and Middle Rivers (highlighted in red). Water entering the Delta via the San Joaquin River (orange arrows) splits at the head of Old River junction, feeding a northerly flow into Old and Middle Rivers.

The project description in the RDEIR/SDEIS indicates that the HORB will be closed from the start of the San Joaquin River salmon migration in January (assumed to be January 1 in the modeling) through June 15 except for real time operational (RTO) decisions for flooding, water stage, and water quality concerns. RDEIR/SDEIS, Section 4.1.2.2 at

p. 4-1-13. Of these potential RTO modifications, only flooding concerns are quantified in the RDEIR/SDEIS; to alleviate the flooding concerns, the HORB will be opened when San Joaquin River flow as measured at Vernalis is greater than 10,000 cfs. RDEIR/SDEIS, Section 4.3.7 at p. 4.3.7-180; *see also* 2013 BDCP Draft EIR/EIS, Chapter 3 at pp. 3-203 and 3-205.

During this same time period each year from January to June, positive OMR is required in each month as follows:

- January – Wet* years
- February – Wet* years
- March – Wet* and Above Normal* years
- April – when Vernalis flow > 5,666 cfs
- May – when Vernalis flow > 5,666 cfs
- June – when Vernalis flow > 3,500 cfs

* Wet and Above Normal water year types are defined by the Sacramento River 40-30-30 index.

RDEIR/SDEIS, Section 4.1.2.2 at p. 4.1-8.

Table 3-1 below indicates the percent of time that positive OMR is required, the percent of time that the HORB may be closed without flood concerns (i.e., Vernalis flow is less than 10,000 cfs), and the combined occurrence of these two conditions for Alternative 4A. OMR is required to be positive when the HORB may be closed without flood concerns in a significant portion of the 82-year simulation period in all months from January through June.

**Table 3-1. Frequency of OMR and HORB operating criteria for Alternatives 4 and 4A**
Frequency of occurrence of OMR and HORB operating criteria based upon the project description for Alternatives 4 and 4A. Source: Determined from modeling results for Alternative 4/4A H3 ELT, provided by DWR (DWR, 2013)

| *Month* | Percent of Years with Required OMR ≥ 0 | Percent of Years that HORB may be closed without flood concerns | Percent of Years with Required OMR ≥ 0 and HORB may be closed without flood concerns |
|---|---|---|---|
| *January* | 32 | 88 | 26 |
| *February* | 32 | 82 | 17 |
| *March* | 48 | 83 | 32 |
| *April* | 61 | 85 | 46 |
| *May* | 55 | 84 | 39 |
| *June* | 26 | 90 | 16 |

Overall, positive OMR is required when the HORB may be closed for at least one month between January and June in 67% of the years that were analyzed. However, as explained below, it is physically impossible for OMR to be positive with the HORB closed.

Closure of the HORB blocks flow in the San Joaquin River from entering Old River which, as discussed above, is the only source of positive OMR; closure of the HORB thus prevents OMR from being positive. As a result, the project description for OMR flow requirements is internally inconsistent with the project description for HORB operation in two-thirds of the analysis period.

This inconsistency is demonstrated by reviewing measurements of OMR flows at times when a barrier has been installed at the head of Old River in the past. Historically, a temporary barrier of rocks at the head of Old River has been constructed in the fall or spring[1]. Review of OMR flows that were measured when the HORB was installed confirms that OMR is never positive with the HORB installed (Figure 3-2).

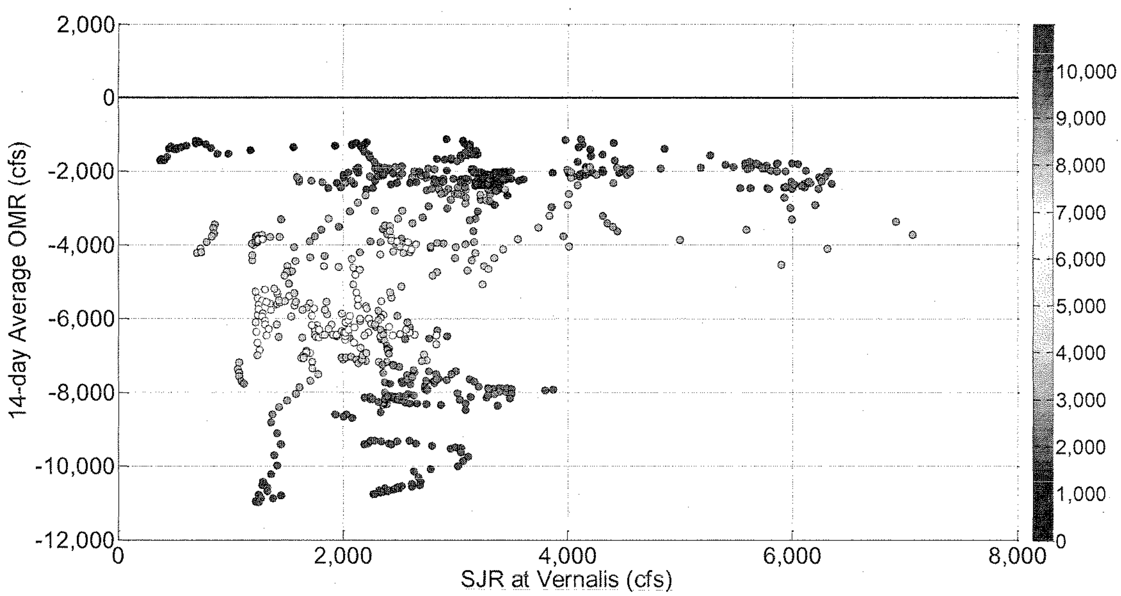



**Figure 3-2. Old and Middle River flow when HORB is closed**
Historical measurements of 14-day averaged tidally filtered net flow in Old and Middle Rivers when the HORB is installed plotted against the flow in the San Joaquin River at Vernalis and colored by the total pumping at the existing south Delta export facilities.

[1] Revised Alternative 4 and new Alternatives 4A and 2D propose to replace this temporary rock barrier with a permanent operable barrier that will be opened and closed as indicated in the project description. Where the temporary barrier is typically installed for no more than 3 months a year (2 months in the fall and 1 month in the spring), the permanent barriers is proposed to be closed for over 7 months of the year (2 months in the fall and 5 ½ months in the winter and spring), which would dramatically alter Delta water quality.

Pumping at the existing CVP and SWP export facilities in the south Delta (Jones and Banks, respectively) contributes to negative OMR – the greater the total pumping at the existing south Delta facilities, the more negative OMR (Figure 3-2). Limiting pumping at the south Delta facilities limits the negative OMR but cannot create positive OMR. Positive OMR can only occur with inflow from the San Joaquin River when the HORB is *not* installed.

Since the project description for OMR flow requirements is internally inconsistent with the project description for HORB operation, the modeling cannot be configured to meet both requirements. Instead, the RDEIR/SDEIS modeling assumes that the HORB would be 50% open at times when the project description indicates that the HORB would be closed. RDEIR/SDEIS, Section 4.1.2.2, Table 4.1-2, at p. 4.1-9. This partial opening in the modeling allows water to enter the south Delta through the HORB, which would not be possible if the HORB is closed as described in the project description. This inconsistency results in an underestimation of water quality impacts, as described in Section 5.3 below.

### *3.3. Failure to Describe How New Facilities Would be Integrated into the Statewide Water Supply System Results in Unrealistic Operations and Underestimates Impacts*

The project description lacks an operations plan with information regarding how operation of existing water supply facilities will be modified (i.e., how the facilities will be "reoperated") to integrate the new facilities that are proposed by the BDCP/CWF into the water supply system. Consequently, the modeling utilized in the impacts assessment did not include reasonable logic for reoperation of existing facilities, resulting in unrealistic operations and an underestimation of water supply and water quality impacts.

The SWP and CVP coordinate operation of their facilities, including operation of reservoirs located upstream of the Delta and operation of the diversion facilities within the Delta that export water to the San Joaquin Valley and southern California. The system is connected by natural waterways such as the Sacramento River and man-made canals such as the Delta-Mendota Canal. Operations in one location can affect operations throughout the system. For example, the amount of water released from the upstream storage reservoirs is inextricably tied to the amount of water pumped out of the Delta at the export facilities.

The RDEIR/SDEIS fails to give adequate consideration to the changes to existing facilities operations that would necessarily occur due to implementation of the Preferred Alternative. This creates flaws in the analysis of water supply, water quality, and fisheries impacts. CCWD's July 25, 2014 comment letter on the 2013 BDCP Draft EIR/EIS provides examples of these flaws (e.g., Sections 1.1.2, 2.3.2.1, and 2.3.2.2). These flaws remain in the RDEIR/SDEIS, and the revised environmental assessment gives rise to an additional flaw as described below.

Delta outflow in October is typically regulated by the Bay-Delta Water Quality Control Plan, with water released from upstream CVP and SWP reservoirs to meet minimum Delta outflow requirements or salinity standards. There is seldom enough precipitation in the watershed in October for natural Delta outflow to be in excess of these requirements.

However, the BDCP modeling indicates that Delta outflow would exceed the amount necessary to meet minimum outflow requirements and salinity standards over 66% of the time in the early long term (ELT) for Alternatives 4/4A[2] H3 and H4 (Figure 3-3). In comparison, the No Action Alternative[3] has excess Delta outflow in October only 2% of the time in the ELT.

The dramatic increase in the occurrence of excess flow under Alternatives 4/4A H3 and H4 in the ELT is not as substantial in the late long term (LLT) and is probably the cause for the different impact determinations between the ELT (as analyzed in the RDEIR/SDEIS) and the LLT (as analyzed in the 2013 BDCP Draft EIR/EIS). Although excess October Delta outflow occurs less often in the Alternative 4/4A LLT modeling than in the Alternative 4/4A ELT modeling, the frequency of occurrence in the LLT modeling is also unrealistic.

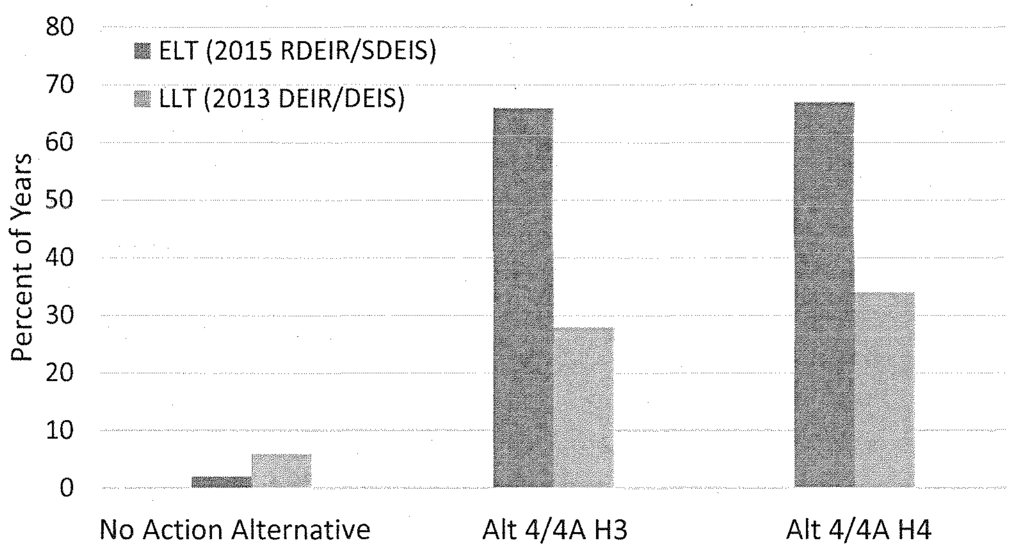



**Figure 3-3. Frequency of Excess Outflow in October**
Percent of years in the 82-year analysis period (water years 1921-2003) when Delta outflow in the month of October is in excess of the amount needed to satisfy minimum Delta outflow requirements and Delta salinity standards.
Source: Modeling results provided by DWR (DWR, 2013)

[2] The RDEIR/SDEIS uses modeling for Alternative 4 under ELT conditions to assess impacts for Alternative 4A for both the H3 and H4 operational scenarios.

[3] The No Action Alternative is used for comparison because it includes the same assumptions for hydrology and water demands, which have a direct effect on Delta outflow, as Alternative 4/4A. In contrast, the CEQA baseline includes different assumptions for hydrology and water demands than the No Action Alternative and Alternative 4/4A.

The excess Delta outflow simulated in Alternative 4/4A is due to the lack of a coherent operations plan. In particular, operational requirements for the new project facilities and modified operational criteria for the existing south Delta facilities were specified for the operational model (CALSIM II) without recognizing that these new criteria for the proposed BDCP/CWF would upset the operations of the larger water supply system.

In this instance, the modeling projects that Water Quality Control Plan requirements for flow in the Sacramento River at Rio Vista would cause releases from upstream reservoirs that cannot be captured at the south Delta facilities and instead become excess Delta outflow. This seldom happens in the No Action Alternative because there are no OMR requirements in October under the No Action Alternative, so that flow released to meet the Rio Vista requirements can be exported at the south Delta facilities.

The project descriptions for the revised Alternative 4 and the new Alternative 4A indicate that that the south Delta facilities will be shut down for 14 days in October. The 14-day shut-down requirement is modeled as a requirement for OMR to be greater than –5,000 cfs for the entire month of October – even though there are no OMR requirements in the project description for October. When OMR is regulated, pumping at the CVP and SWP south Delta export facilities is limited. Since the modeling assumes OMR is regulated for the entire month of October, the water released from reservoirs to meet Rio Vista flow requirements cannot be fully captured at the south Delta facilities.

In reality, the south Delta facilities would probably be able to capture the additional flows for the 17 days during which export pumping is permitted. For the remaining 14 days when the south Delta export facilities are shut down, the CVP and SWP, rather than increasing reservoir releases, are far more likely to limit the amount of reservoir releases that flow out to the San Francisco Bay by closing the Delta Cross Channel to meet Sacramento River flow requirements at Rio Vista flow requirements without creating excess Delta outflow.

When the Delta Cross Channel gates are open, a portion of the Sacramento River flow enters the central Delta, reducing flow in the Sacramento River downstream of the Delta Cross Channel (Figure 3-4). To meet flow requirements in the Sacramento River at Rio Vista, DWR and Reclamation have two options: (1) increase reservoir releases to increase the Sacramento River flow entering the Delta, or (2) close the Delta Cross Channel gates to increase the amount of flow that reaches Rio Vista without increasing Sacramento River inflow.

The operational strategy to close the Delta Cross Channel to meet Rio Vista flows without unnecessary reservoir releases has been implemented recently in November of 2009 and in October of 2013 and 2014 (Reclamation, 2015). This is the realistic operational strategy that should have been used in the modeling. Failure to model this operational strategy, when it has in fact been implemented repeatedly in recent years, biases the salinity results in the water quality impacts analysis, showing reduced salinity with the project. In reality, when the Rio Vista flow requirements are met by closing the Delta Cross Channel instead of by releasing flow from upstream reservoirs, interior Delta salinity will increase with the project.

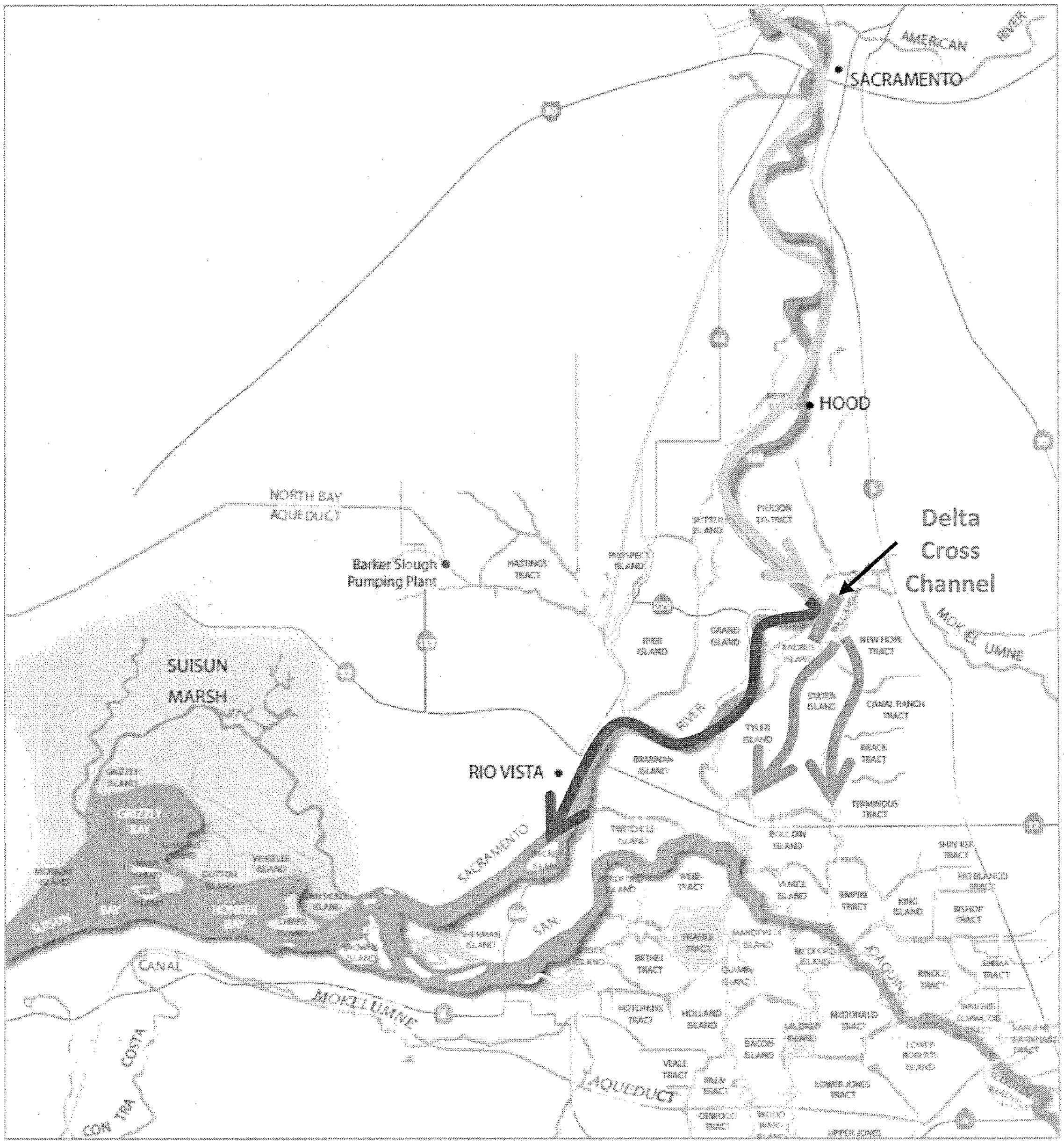
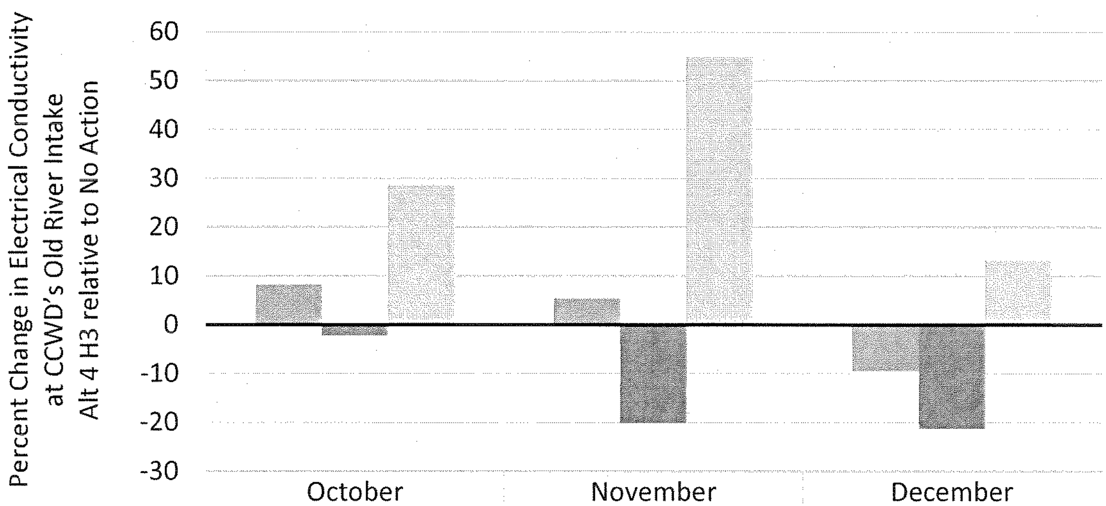



**Figure 3-4. Closure of the Delta Cross Channel maintains higher flow in the Sacramento River**

With the Delta Cross Channel gates open, a portion of the Sacramento River flow (orange arrow) enters the central Delta (dark orange arrows), reducing flow in the Sacramento River downstream of the Delta Cross Channel (purple arrow).

The unrealistic excess Delta outflow in October freshens the modeled interior Delta salinity for many months. This is illustrated in Figure 3-5, which shows that excess Delta outflow in October freshens the water at CCWD's Old River Intake in October and that the freshening effect is maintained through December (blue bars in Figure 3-5). In contrast, during years without excess Delta outflow in October, Alternative 4/4A H3 increases the salinity at CCWD's Old River Intake in October, November, and December (orange bars in Figure 3-5). Further, averaging salinity over all years (green bars in Figure 3-5) underestimates the impacts that would occur.

This discussion serves to show that the unrealistic assumption of excess Delta outflow results in a significant underestimation of salinity impacts as a result of the proposed project. Conversely, implementing and modeling an operations plan that corrects this unrealistic excess Delta outflow assumption would reveal greater salinity impacts due to the project.




| | October | November | December |
|---|---|---|---|
| All Years | 8 | 5 | -10 |
| Excess | -2 | -20 | -21 |
| No Excess | 29 | 55 | 13 |

**Figure 3-5. Excess Delta Outflow in the month of October during the Early Long Term biases the modeling results for multiple months**
Monthly average percent change in salinity in Alternative 4/4A at ELT relative to the No Action Alternative at ELT. Source: Modeling studies provided by DWR (DWR, 2013) processed for the entire 82-year study period.

# 4. The Early Long Term Analysis for the New Alternatives Does Not Adequately Evaluate and Disclose the Project's Impacts

The environmental analysis in the RDEIR/SDEIS for the new alternatives (Alternatives 2D, 4A and 5A) compares 2009 baseline conditions to future cumulative conditions that are projected to occur in the year 2025 (the "Early Long Term" or ELT) with the proposed project in place. As explained in CCWD's July 25, 2014 comment letter, the 2009 baseline, and the comparison of project impacts against that baseline, are inadequate for a number of reasons. The environmental analysis in the RDEIR/SDEIS gives rise to two additional flaws:

- First, by focusing on the year 2025, which will be less than ten years after project approval, the analysis of the new alternatives does not adequately describe the impacts of the alternatives over the longer term.

- Second, the analysis of the new alternatives obscures what the impacts of the alternatives will be even in the year 2025. Instead of comparing the impacts of the alternatives to the existing conditions baseline, the analysis compares future cumulative conditions that will occur in the year 2025 to the existing conditions baseline. But these future cumulative conditions include the effects of the proposed project, plus the anticipated effects from climate change and sea level rise in the year 2025. As a result, it is not possible to distinguish the impacts that would be caused by the proposed project in relation to the CEQA baseline from the impacts that would be caused by climate change in relation to that baseline. The analysis is therefore confusing and inconsistent, obscuring the environmental impacts attributable to the approval and implementation of the proposed project.

Each of these flaws is described separately in the two sections that follow.

## *4.1. The Analysis Does Not Adequately Evaluate the Impacts of the New Alternatives Beyond 2025*

The environmental analysis for the new alternatives (Alternatives 4A, 2D and 5A) does not comply with the requirements under CEQA and NEPA to assess both short-term and long-term impacts. More specifically, the analysis for the new alternatives contains an evaluation of short-term effects projected to occur in the year 2025, but does not adequately evaluate the environmental impacts that could occur over the long term.

The CEQA Guidelines make clear that the direct and indirect environmental effects of a proposed project "shall be clearly identified and described, giving due consideration to both the short-term and long-term effects." CEQA Guidelines § 15126.2(a); *see also Neighbors for Smart Rail v. Exposition Metro Line Construction Authority*, 57 Cal. 4th 439, 454 (2013). The NEPA regulations echo this requirement, stating that, in assessing the significance of an impact, "[b]oth short- and long-term effects are relevant." 40 C.F.R. §

1508.27(a). Thus, under both statutes, the environmental analysis must assess short-term ***and*** long-term impacts.

As CCWD noted in its July 25, 2014 comments, the analysis in the 2013 BDCP Draft EIR/EIS of the initial set of alternatives for the proposed project violates these requirements by limiting the impact analysis to the year 2060, thus failing to evaluate the impacts over the short and medium term. The analysis in the RDEIR/SDEIS of the new alternatives (Alternatives 2D, 4A and 5A) creates the opposite problem, by failing to present an adequate evaluation of impacts beyond the year 2025.

The analysis for the new alternatives states that the "early long term" – which is based on conditions projected to occur in the year 2025 – is used for evaluating the impacts of the new alternatives. RDEIR/SDEIS, Section 4.1.6 at p. 4.1-42; *see also id.*, Section 4.1.2.1 at p. 4.1-5 (describing Alternative 4A and noting that operations are evaluated at the early long term, "which is associated with conditions around 2025"); Section 4.1.3.1 at p. 4.1-22 (Alternative 2D); Section 4.1.4.1 at p. 4.1-30 (Alternative 5A). The document goes on to explain that "because the project would continue indefinitely, the analysis qualitatively examines impacts at the Late Long-Term timeframe for Alternatives 4A, 2D, and 5A, but does not make a CEQA or NEPA conclusion…." *Id*, Section 4.1.6 at p. 4.1-42.

In other words, for impacts beyond the year 2025 – which will be less than 10 years after project approval, and at around the same time as the onset of most of the project's operational impacts[4] – the analysis does not fulfill its critical role as an informational document, because it does not quantify the impacts and does not make a conclusion on whether the impacts are significant or not. And without a significance conclusion, it cannot be ascertained whether mitigation should be evaluated for the long-term effects and, if so, what mitigation measures would be feasible. This is a critical omission for a project of this magnitude, which will have a wide array of lasting impacts on water quality, water supply, surface and ground water, and aquatic resources.

The environmental analysis should be revised to present an evaluation of both short-term and long-term effects, as required under CEQA and NEPA. This analysis should make findings on whether the long-term effects are considered to be significant, so that the decision-makers and the public are fully apprised of what the project's effects will be and whether measures are needed to mitigate those effects over the full life of project operations, not just the first few years.

[4] According to the RDEIR/SDEIS, construction is anticipated to last about a decade and operation of the project could begin as early as 11 years after permits are issued. RDEIR/SDEIS, Appendix A, Revised Chapter 3 at p. 3-6 (Alternative 4) and Executive Summary at p. ES-17 (Alternative 4A - stating that all aspects of construction would be identical to Alternative 4).

### *4.2. The Analysis Improperly Conflates the Impacts of the New Alternatives with the Impacts from Climate Change and Sea Level Rise in 2025*

The analysis in the RDEIR/SDEIS for the new alternatives recognizes that the "early long term" scenario used to evaluate the impacts of the new alternatives includes the effects of climate change and sea level rise projected to occur in the year 2025. In other words, for purposes of the CEQA evaluation, the environmental impacts of the alternatives in 2025 – plus the impacts of climate change in that year – are compared to the 2009 baseline conditions. RDEIR/SDEIS, Section 4.1.6 at p. 4.1-42; and Section 4.2 at p. 4.2-1. As the analysis recognizes, "[t]he effects of climate change and sea level rise will foreseeably have some effect on the Delta environment during the ELT time period." *Id.*, Section 4.2 at p. 4.2-1.

Thus, under the CEQA approach used to evaluate the new alternatives, project impacts are lumped together with the future effects of climate change. The analysis concedes this point, stating on numerous occasions: "Because the action alternative modeling does not partition the effects of implementation of the alternative from the effects of sea level rise, climate change, and future water demands, the comparison to Existing Conditions *may not offer a clear understanding of the impact of the alternative on the environment.*" *See, e.g.,* RDEIR/SDEIS, Section 4.3.7 at pp. 4.3.7-24, 4.3.7-41, 4.3.7-60, 4.3.7-73, etc. (emphasis added). By failing to offer this clear understanding, the impacts that are specifically attributable to the proposed project are obscured.

The environmental analysis attempts to address this issue by explaining that the comparison under NEPA between the new alternatives and the 2025 No Action Alternative "is a better approach," on the ground that it isolates the effects of the alternatives from the effects of sea level rise, climate change and future water demands. *See id.* But according to the environmental analysis, the CEQA conclusions for the new alternatives, like the CEQA conclusions for the initial set of alternatives, are made in comparison to the 2009 existing conditions baseline. As the RDEIR/SDEIS explains: "The same 'Existing Conditions' baseline defined in the [2013 BDCP] Draft EIR/EIS applies to Alternatives 4A, 2D, and 5A, for the purposes of CEQA impact analysis. Therefore, all CEQA conclusions associated with Alternative 4A, 2D, and 5A are made in comparison to the same Existing Conditions baseline applied for all other alternatives." RDEIR/SDEIS, Section 4.1.6 at p. 4.1-42.

Thus, the CEQA analysis admittedly is unclear in depicting the impacts of the new alternatives. This problem in the CEQA analysis cannot be fixed by pointing the reader to the different approach used for the federal NEPA evaluation, which compares project impacts against future no project conditions. As the California Supreme Court explained in the *Neighbors for Smart Rail* case, the CEQA Guidelines make clear that when the existing conditions baseline is used to determine a project's significant adverse impacts, as is the case here, this baseline "is ***not*** the same as the no project alternative, which takes into account future changes in the environment reasonably expected to occur if the project is not approved." 57 Cal. 4th at 454 (Supreme Court's emphasis); *see* CEQA Guidelines § 15126.6(e)(1) ("The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline…"). This confirms that the RDEIR/SDEIS cannot use the no project/no action scenario to cure the defects in its CEQA baseline evaluation. To provide a clear picture of the CEQA analysis and conclusions, the RDEIR/SDEIS needs to be revised to compare the project's impacts against the CEQA baseline, without using future effects that are not attributable to the project to obscure the analysis.

The lumping together of project impacts with the future effects of climate change not only obscures what impacts are attributable to the proposed BDCP/CWF, it also obscures the mitigation that should be evaluated to address those impacts. To make matters worse, the project proponents assert that they are not obligated to make any contribution to mitigation that is needed "solely or substantially" to address adverse water quality effects due to sea level rise or changed precipitation patterns attributable to climate change. RDEIR/SDEIS, Appendix A, Revised Appendix 3B at p. 3B-73. Thus, including future climate change effects as part of the project impact analysis allows the project proponents to disavow obligations to mitigate impacts.

# 5. The Modeling Used in the RDEIR/SDEIS Does Not Accurately Portray Either the Actual Baseline Conditions or the Elements of the Proposed Project, Resulting in an Analysis that Obscures and Underestimates Impacts

The RDEIR/SDEIS uses quantitative modeling to assess the potential impacts of the project alternatives on water supply, surface water, water quality, and aquatic resources. But this modeling suffers from several significant flaws. As a result of these modeling flaws, the environmental analysis understates and obscures the true extent of the adverse impacts that the proposed project would cause.

This is not a dispute among experts over the appropriate model or methodology to use in the environmental analysis. Rather, this is a situation where the inputs to the model simply fail to represent the actual baseline conditions and the basic elements of the project alternatives. This results in an inherently flawed and unreliable environmental impact analysis.

This section discusses three core deficiencies in the modeling:

- Section 5.1 documents the discrepancies between the modeling assumptions used on the one hand, and the actual baseline conditions and project elements as described in the project description on the other. This section also provides examples of specific flaws in the environmental analysis that result from these discrepancies.

- Section 5.2 evaluates the sensitivity studies that the RDEIR/SDEIS uses to justify the reliance on the prior modeling assumptions used in the 2013 BDCP Draft EIR/EIS to evaluate the three new alternatives, including the Preferred Alternative (Alternative 4A). This evaluation reveals project impacts that are not disclosed and evaluated in the RDEIR/SDEIS.

- Section 5.3 provides an example to demonstrate that the proposed project cannot be operated as described in the project description. This section then describes how this inconsistency results in the underestimation of the adverse water quality impacts that the proposed project would cause.

## *5.1. The Modeling Assumptions Are Not Realistic and Result in Significant Inaccuracies in the Environmental Impact Analysis*

This section outlines the various ways in which the modeling used in the RDEIR/SDEIS is unrealistic and results in an environmental analysis that systematically masks and understates the project's impacts:

- As discussed in Section 5.1.1 below, the modeling used to represent the baseline conditions omits a currently effective regulatory flow requirement (the "Fall X2" requirement) that was adopted by the U.S. Fish & Wildlife Service in 2008. Compliance with this mandatory requirement freshens the Delta in the fall, so omitting it from the modeling makes the baseline water quality appear worse than it actually is. Further, the RDEIR/SDEIS includes the Fall X2 requirement in the modeling for the alternatives, so that the difference in water quality between the alternatives and the baseline conditions appears less adverse than it actually is. By excluding the positive salinity effects of the Fall X2 requirement from the modeling for the baseline, while including these positive effects in the modeling for the alternatives, the analysis masks the true extent of the project's salinity impacts.

- As discussed in Section 5.1.2 below, the modeling for the No Action Alternative does not match the description of this alternative in the RDEIR/SDEIS. As a result of this discrepancy, the environmental impact analysis is inaccurate and unreliable, and the true effects of the project alternatives in comparison to the No Action Alternative cannot be determined.

- As discussed in Section 5.1.3 below, the RDEIR/SDEIS makes it clear that the new alternatives, unlike the initial set of alternatives, are not designed to serve as a habitat conservation plan under the federal Endangered Species Act. As a result, the project description indicates that the new alternatives include only a small portion of the habitat restoration acreage included in the initial set of alternatives. Yet the modeling for the new alternatives – including Alternative 4A, the new Preferred Alternative – still includes the extensive habitat restoration from the prior modeling used for the initial alternatives. This is another flaw in the modeling that results in underestimating the project's adverse salinity impacts.

- Section 5.1.3 discusses another flaw in the modeling: For the three new alternatives in the RDEIR/SDEIS, the information in the project description regarding project components and operations is incomplete, but even the limited information that is provided is not adequately reflected in the environmental analysis. The three new alternatives are significantly different than any of the alternatives analyzed in the 2013 BDCP Draft EIR/EIS. Nonetheless, the analysis of the three new alternatives in the RDEIR/SDEIS uses, without change, the operations, hydrodynamic, and water quality modeling from the 2013 BDCP Draft EIR/EIS. As a result of this major disconnect, the RDEIR/SDEIS acknowledges that there is "notable uncertainty in the results of all quantitative assessments that refer to modeling results, due to the differing assumptions used in the modeling." Yet the RDEIR/SDEIS relies on the outdated modeling to make incorrect determinations that the project does not have significant water quality impacts.

To inform the discussion in the following sections, Table 5-1 below presents key discrepancies between the modeling assumptions used to assess the impacts of the proposed project and (1) the actual baseline conditions; (2) the description in the RDEIR/SDEIS of the No Action Alternative; and (3) the description in the RDEIR/SDEIS of the three new alternatives (Alternatives 2D, 4A and 5A).

**Table 5-1. Comparison of Modeling Assumptions vs. Actual Baseline Conditions, Project Description of No Action Alternative & Project Description of New Alternatives.**

| | | Existing Conditions (CEQA baseline) | | No Action Alternative (NEPA baseline) | | Alternatives 2D, 4A, and 5A | |
|---|---|---|---|---|---|---|---|
| | | **Actual Conditions** | **Model** | **RDEIR / SDEIS Discussion** | **Model** | **Project Description** | **Model** |
| **Climate Change** | **Hydrology** | historical | historical | 2025 forecast | 2025 forecast | 2025 forecast | 2025 forecast |
| | **Sea Level Rise** | none | none | 15 cm | 15 cm | 15 cm | 15 cm |
| **2008 USFWS / 2009 NMFS BiOp Requirements** | **Fall X2** | yes | no | yes | yes | yes | yes |
| | **Tidal Marsh Restoration** | 8,000 acres required by 2018 | 0 acres | 8,000 acres | 0 acres | described as part of the NEPA baseline | modeled as part of each alternative |
| | **Flood Plain Restoration** | 17,000 to 20,000 acres required as initial target | 0 acres | implemented via Yolo Bypass enhancements | 0 acres; no Yolo Bypass enhancements | described as part of the NEPA baseline | modeled as part of each alternative |
| **Project Components** | **Tidal Marsh Restoration** | None | 0 acres | EcoRestore (1,000 ac. above the BiOp requirements) | 0 acres | 55 to 65 ac. | 25,000 ac. (inc. BiOp, EcoRestore and add'l 16,000 ac.) |
| | **Salinity objective compliance location** | Emmaton | Emmaton | Emmaton | Emmaton | Emmaton | Three Mile Slough |
| | **Suisun Marsh Salinity Control Gates** | operated | operated | operated | operated | operated | not operated |
| | **Head of Old River Barrier[a]** | installed / operated Apr-May; Sept-Nov | partial closure Sept 16 to Nov 30 | installed / operated Apr-May; Sept-Nov | partial closure Sept 16 to Nov 30 | potential closure Oct-Nov and Jan-June 15 | 50% open during the times assumed to be closed |
| | **Clifton Court Forebay Inflow[a]** | 6,680 cfs (plus 1/3 of San Joaquin River flow Dec 15 to March 15) | 6,680 cfs (plus 1/3 of San Joaquin River flow Dec 15 to March 15) | not mentioned in RDEIR / SDEIS | 6,680 cfs (plus 1/3 of San Joaquin River flow Dec 15 to March 15) | not mentioned in RDEIR / SDEIS | 10,300 cfs |

[a] Modifications to the Head of Old River Barrier and Clifton Court Forebay Inflow do not apply to Alternative 5A.

### *5.1.1. Flaws in the Modeling for the CEQA Baseline Skew the Water Quality Impacts Analysis*

The CEQA baseline used in the RDEIR/SDEIS omits a current regulatory flow requirement that maintains relatively low salinity in the Delta in the fall of relatively wet years. This requirement is included in the alternatives modeling. Since the impacts of the alternatives are measured under CEQA against the baseline conditions, excluding the salinity benefits from the baseline, while including them in the evaluation of the alternatives, serves to mask the true extent of the project's negative effects on salinity.

The 2008 USFWS Biological Opinion (BiOp) specifies that during the months of September, October, and November that follow a relatively wet year[5], operation of the CVP and SWP must be modified to reduce salinity in the western Delta as indicated by the location of the two parts per thousand isohaline (i.e., X2); this action is commonly referred to as "Fall X2." Although the Fall X2 requirement was adopted in 2008, Fall X2 was not modeled as part of the CEQA baseline. By modeling Fall X2 as part of the alternatives but not the baseline, the benefits in water quality that are due to implementation of Fall X2 appear as benefits attributable to the project in the impacts analysis, which underestimates the project's true salinity effects. *See* Section 2.1.1.2 of CCWD's July 25, 2014 comment letter on the 2013 BDCP Draft EIR/EIS.

### *5.1.2. Differences between the Description and Modeling of the No Action Alternative Contribute to Obscuring Water Quality Impacts*

The modeling for the No Action Alternative reveals an additional problem: this modeling does not match the description in the RDEIR/SDEIS of the No Action Alternative so that the true extent of the project's impacts as measured against the No Action Alternative cannot be determined, affecting both the CEQA and the NEPA analysis. Under NEPA, the No Action Alternative serves as the baseline for measuring the impacts of the project alternatives. Therefore, without accurate modeling of No Action Alternative, the impact assessment for the project alternatives is faulty and unreliable. Under CEQA, the No Action (or No Project) Alternative provides a different – but no less important – function, which "is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." CEQA Guidelines § 15126.6(e)(1); *see also Neighbors for Smart Rail*, 57 Cal. 4th at 454. But if the impacts of the No Action/No Project Alternative are not accurately depicted, then this comparison is not accurate and does not inform the decision-makers as it should.

The underlying problem is that the No Action Alternative was substantially reformulated in the 2015 RDEIR/SDEIS, yet the modeling was not updated to reflect this new formulation.

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[5] Specifically, "wet" or "above normal" water years as defined by the Sacramento Valley 40-30-30 index.

The 2008 USFWS Biological Opinion specifies that 8,000 acres of tidal marsh must be restored within 10 years (i.e., by 2018) and the 2009 NMFS Biological Opinion requires floodplain habitat restoration with an initial target of 17,000 to 20,000 acres. Many tidal marsh restoration projects are in the planning stages and DWR and Reclamation are preparing a draft EIR/EIS for the Yolo Bypass Salmonid Habitat Restoration and Fish Passage project to satisfy the floodplain habitat restoration targets.

As explained in CCWD's July 25, 2014 comment letter, the 2013 BDCP Draft EIR/EIS improperly excluded these required habitat restoration actions from the No Action Alternative. The RDEIR/SDEIS changes course, specifying that "enhancements to the Yolo Bypass and 8,000 acres of tidal habitat restoration areas would be developed under the No Action Alternative (ELT)." RDEIR/SDEIS, Section 4.2.7 at pp. 4.2-19; *see also id.*, Section 4.1.2.3 at p. 4.1-15; Section 4.1.6 at p. 4.1-42. However, modeling conducted for the ELT No Action Alternative assumed no implementation of Yolo Bypass improvements or tidal habitat restoration. *Id.*, Section 4.2.7 at pp. 4.2-18 to 4.2-19. After acknowledging this discrepancy, the RDEIR/SDEIS states:

> In general, the significance of this difference is the assessment of bromide, chloride and EC for the No Action Alternative (ELT), relative to Existing Conditions, likely underestimates increases in bromide, EC, and chloride that could occur, particularly in the west Delta.

*Id.*, Section 4.2.7 at p. 4.2-19.

But there is no evidence presented in the RDEIR/SDEIS to support this conclusion. As discussed in Section 1.2.2 of CCWD's July 25, 2014 comment letter on the 2013 BDCP Draft EIR/EIS, the effect of habitat restoration on water quality depends on the location, timing, and design of the habitat restoration actions. Without this information, it is not possible to determine if the failure to model the habitat restoration actions required in the USFWS and NMFS Biological Opinions underestimates or overestimates salinity for the No Action Alternative, to what extent salinity levels might differ, and where in the Delta these effects would be realized. With an uncertain baseline, the impacts of the project cannot be ascertained.

### *5.1.3. Differences between the Description and Modeling of the Proposed Project Contribute to Obscuring and Underestimating Water Quality Impacts*

#### 5.1.3.1. The project modeling includes habitat restoration that is not part of the project description, thereby underestimating salinity impacts

Unlike the initial set of alternatives discussed in the 2013 BDCP Draft EIR/EIS, the new alternatives (including Alternative 4A, the new Preferred Alternative) would not serve as habitat conservation plans and do not include a significant habitat restoration component. RDEIR/SDEIS, Executive Summary at p. ES-3. This is a dramatic change in approach for implementing the project and a major impetus for preparing the RDEIR/SDEIS. But despite this significant change in the project, the modeling used to evaluate the impacts of the new alternatives still includes the extensive habitat restoration that is part of the alternatives set forth in the 2013 BDCP Draft EIR/EIS. As discussed below, this has the effect of underestimating the project salinity impacts.

The tidal marsh habitat and flood plain enhancements that are required by the 2008 USFWS and 2009 NMFS Biological Opinions – which the RDEIR/SDEIS describes as being developed under the No Action Alternative at ELT but does not model as part of the NAA ELT – are modeled as part of each of the new project alternatives that are analyzed in the RDEIR/SDEIS. Furthermore, even though the new alternatives would no longer serve as a habitat conservation plan, the modeling includes 17,000 acres of tidal marsh in addition to the requirements in the USFWS and NMFS Biological Opinions, for a total of 25,000 acres of tidal marsh. As the environmental analysis explains,

> [I]mpact analyses reliant on physical modeling apply results consistent with an "Early Long-Term" timeframe. Based on the assumptions used for the original purposes of these model runs, these results also assume implementation of two elements, Yolo Bypass improvements and 25,000 acres of tidal wetland restoration. These two elements were included in the modeling because they were components of Alternative 4, for which the modeling was originally conducted. These two elements, however, are not proposed as part of Alternatives 4A, 2D, or 5A.

RDEIR/SDEIS, Section 4.1.6 at p. 4.1-43. Thus, while Alternative 4A, the new Preferred Alternative, actually includes only 59 acres of tidal wetland restoration (*id.*, Section 4.1.2.1 at p. 4.1-5), the impact assessment is modeled on the assumption that this alternative has more than 400 times this acreage of tidal wetland restoration.

As a result of this failure of the modeling to capture the actual habitat restoration components of the new alternatives, the impacts of the alternatives are conflated with the effects of the assumed habitat restoration actions that were developed for the original alternatives in the 2013 BDCP Draft EIR/EIS. Section 2.1.5.1 of CCWD's July 25, 2014 comment letter on the 2013 BDCP Draft EIR/EIS explains how this conflation obscures and underestimates water quality impacts of operation of the proposed water supply facilities.

After acknowledging that the Yolo Bypass improvements and tidal restoration are not part of the new project alternatives even though these features were included in the modeling, the RDEIR/SDEIS concludes that the inclusion of these features in the modeling probably overestimates salinity in the west Delta.

> The analysis of boron, bromide, chloride, Dissolved organic carbon (DOC), electrical conductivity (EC), and nitrate under Alternative 4A in the ELT is based on modeling conducted for Alternative 4 in the ELT, which assumes implementation of Yolo Bypass Improvements and 25,000 acres of tidal natural communities restoration. As described above, Yolo Bypass

> Improvements are not a component of Alternative 4A and the amount of tidal habitat restoration (i.e. Environmental Commitment 4) would be significantly less than that represented in the modeling. *In general, the significance of this difference is that the assessment of bromide, chloride, and EC for Alternative 4A, relative to Existing Conditions and the No Action Alternative (ELT), likely overestimates increases in bromide, EC, and chloride that could occur, particularly in the west Delta.*

RDEIR/SDEIS, Section 4.3.4 at p. 4.3.4-1 (emphasis added). Similar statements are made in the evaluation of water quality impacts for Alternative 2D (*id.*, Section 4.4.4 at p. 4.4.4-1) and Alternative 5A (*id.*, Section 4.5.4 at p. 4.5.3-1).

However, there is no evidence presented in the RDEIR/SDEIS to support this conclusion. To the contrary, the analysis in the 2013 BDCP Draft EIR/EIS clearly indicates that the particular configuration of tidal marsh included in the modeling *underestimates* salinity impacts, since the modeled restoration reduces salinity in the western Delta. For example, Figure 5-1 below is a reproduction of a figure from the 2013 BDCP Draft EIR/EIS that shows the incremental change in electrical conductivity (EC) due to the ELT tidal marsh configuration (25,000 acres) that was assumed in the models; the locations in the west Delta are boxed for easy identification. At every location analyzed in the west Delta, the mean incremental change in EC due to the ELT tidal marsh is negative, indicating that the incorporation of the ELT tidal marsh reduces salinity at these locations for both models that are used to simulate salinity in the Delta (i.e., DSM2 and RMA). Multiple figures in the 2013 BDCP Draft EIR/EIS illustrate that the ELT tidal marsh configuration reduces salinity in the west Delta. *See, e.g.*, 2013 BDCP Draft EIR/EIS, Appendix 5A, Section D, Attachment 2, Figures 6-26, 6-29, 6-32, 6-35, and 6-41 and Attachment 4, Figures 1-69 to 1-72.

In short, the tidal marsh assumed for the ELT reduces salinity in the west Delta. Thus, including the ELT tidal marsh in the modeling to simulate the project alternatives, when in fact the tidal marsh will not be constructed as part of the alternatives, *underestimates* the impacts to salinity in the west Delta that would be caused by the alternatives.

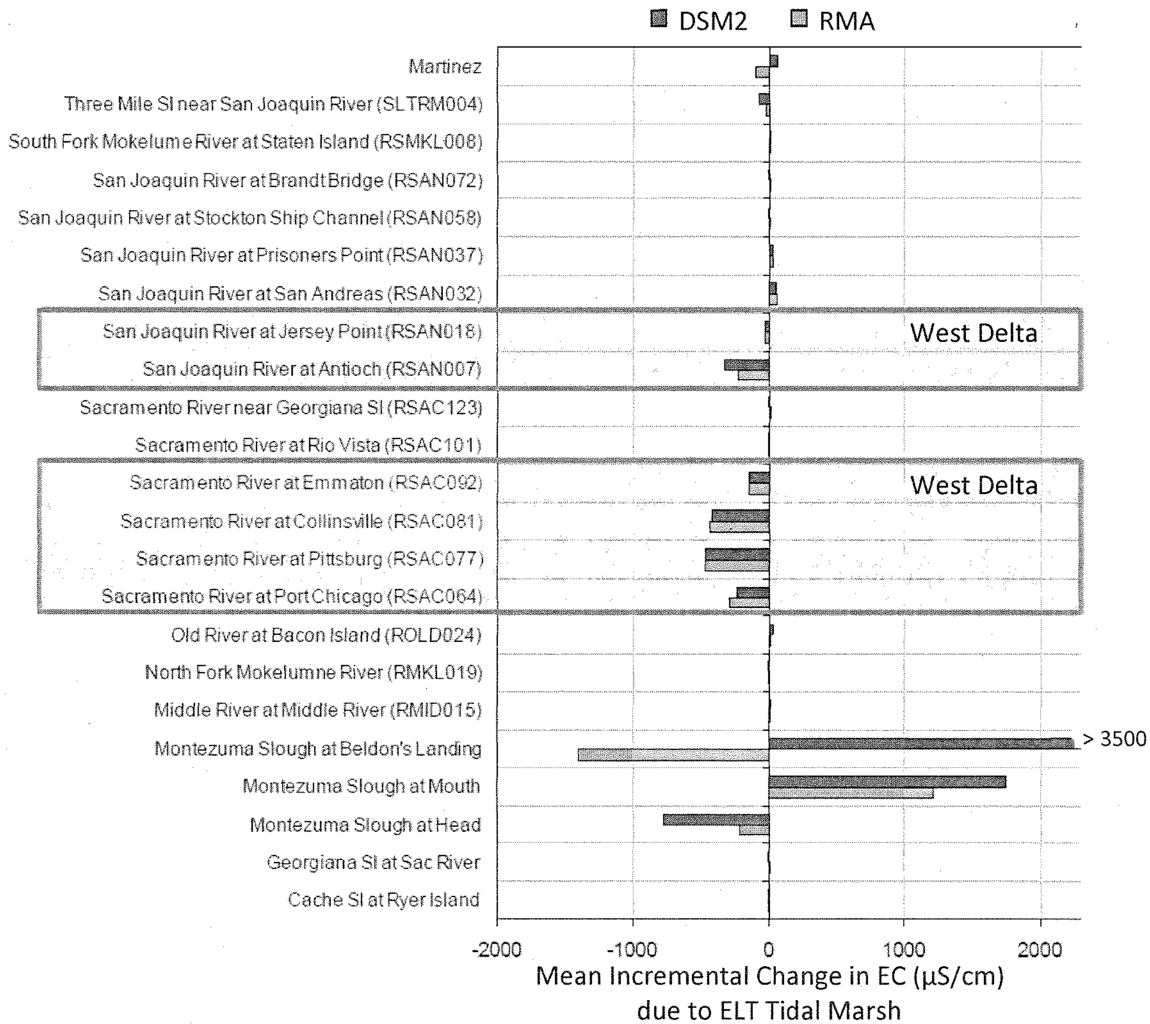


**Figure 5-1. Change in Salinity due to the ELT Tidal Marsh**
Source: Adapted from 2013 BDCP Draft EIR/EIS, Appendix 5A, Section D, Attachment 4, Figure 22 to highlight the stations located in the West Delta.

#### 5.1.3.2. The project modeling includes operational criteria that do not apply to the new alternatives, thereby obscuring and underestimating impacts

The new alternatives presented in the RDEIR/SDEIS would operate under a very different regulatory regime and in a very different manner than the initial set of alternatives studied in the 2013 BDCP Draft EIR/EIS. But the modeling used in the RDEIR/SDEIS to assess the impacts of the new alternatives has not been updated to reflect these important differences and still includes the same assumptions used in the 2013 analysis. As a result of this significant discrepancy, the RDEIR/SDEIS acknowledges that "there is notable uncertainty in the results of all quantitative assessments that refer to modeling results, due to the differing assumptions used in the modeling and the description of Alternative 4A and the No Action Alternative (ELT)." RDEIR/SDEIS, Section 4.3.4 at pp. 4.3.4-1 to 4.3.4-2; *see also id.*, Section 4.4.4 at p. 4.4.4-1 (Alternative 2D), and Section 4.5.4 at p. 4.5.4-1 (Alternative 5A).

Despite acknowledging this "notable uncertainty," the RDEIR/SDEIS nevertheless relies upon the old modeling inputs and assumptions to assess the impacts of the new alternatives. This causes the RDEIR/SDEIS to underestimate the true extent of the project's adverse water quality impacts. The 2013 BDCP Draft EIR/EIS impacts analysis was based upon modeling of Alternatives 2A, 4, and 5 at the late long term (LLT) time period, which includes climate change forecast for the year 2060, sea level rise of 45 centimeters, improvements to the Yolo Bypass and 65,000 acres of tidal marsh. During development of the 2013 BDCP Draft EIR/EIS, modeling was also performed for each of the alternatives at the early long term (ELT) time period, which includes climate change forecast for the year 2025, sea level rise of 15 centimeters, improvements to the Yolo Bypass and 25,000 acres of tidal marsh. The ELT modeling for Alternative 4 was included in the 2013 Draft BDCP, and DWR released the ELT modeling for the No Action Alternative and all project alternatives to interested stakeholders (DWR, 2013).

The problem now is that the modeling for the new alternatives has not been updated, so the project descriptions of the new alternatives do not match the modeling used to determine the impacts of those alternatives, as shown in Table 5-1. For example, the new alternatives, as described in the RDEIR/SDEIS, maintain the salinity objective in the Bay-Delta Water Quality Control Plan at Emmaton, but the modeling used to analyze the new alternatives includes the modification of that objective that was part of the original Alternative 4. The new alternatives, as described in the RDEIR/SDEIS, maintain the existing operations of the Suisun Marsh Salinity Control Gates but the modeling does not include any operation of the gates. New Alternatives 4A and 2D, as described in the RDEIR/SDEIS, include significantly more closure of the proposed channel barrier located at the head of Old River than the initial alternatives, but the modeling continues to allow flow through the barrier. All of these differences between the way the proposed project is described and is planned to operate, and the way the project was modeled for purposes of the environmental impact analysis, contribute to incorrect findings in the RDEIR/SDEIS that the project's water quality impacts in the Delta are less than significant.

Furthermore, inflow requirements to the Clifton Court Forebay in the new alternatives may also be incorrectly reflected in the modeling, but this is unclear as the RDEIR/SDEIS provides inconsistent information on this point. Inflow to the Clifton Court Forebay is currently limited to 6,680 cubic feet per second (cfs) plus one-third of the San Joaquin River flow as measured at Vernalis from December 15 to March 15. The 2013 BDCP Draft EIR/EIS proposed to relax this restriction and allow inflow to be 10,300 cfs at all times. 2013 BDCP Draft EIR/EIS, Chapter 3, Table 3-6 at p. 3-36. This table is not redlined in Appendix A of the current RDEIR/SDEIS, leaving the reader to assume that this relaxation is still sought for the revised Alternative 4. Also, the modeling used for the impacts analysis of the revised Alternative 4 and the new Alternatives 4A and 2D includes this relaxation. However, the RDEIR/SDEIS does not mention any changes regarding the inflow restrictions (RDEIR/SDEIS, Sections 4.1.2.2, 4.1.3.2, and 4.1.4.2), which would appear to indicate that the modification to Clifton Court Forebay inflow restrictions is not proposed as part of the new alternatives. If the relaxation of inflow requirements is indeed part of the new alternatives, it must be defined and consistently documented throughout the RDEIR/SDEIS. If the relaxation of inflow requirements is not part of the new alternatives, the modeling must be revised to reflect this fact.

Finally, the mere acknowledgement that there is "notable uncertainty" in the impact assessment due to the differences between the modeling assumptions and the way the alternatives are described and actually designed to operate is not sufficient to fix the problems in the RDEIR/SDEIS. Rather, to truly fix these problems, the modeling must be adjusted to align with the project that is being modeled, so that the impact assessment is accurate and reliable.

## *5.2. Sensitivity Studies to Address the Mismatch between the Project Description and the Modeling Assumptions Are Inadequate and Incomplete*

To address the fact that the modeling used for the impact assessment does not match the actual project alternatives, the RDEIR/SDEIS includes two sets of "sensitivity studies." The first set of sensitivity studies is intended to support the propriety of relying on the modeling conducted for the 2013 alternatives to analyze the substantially different new alternatives; as discussed in Section 5.2.1, the sensitivity studies are inadequate for this purpose. The second set of sensitivity studies is intended to address whether the reported exceedances of salinity objectives identified in the 2013 BDCP Draft EIR/EIS are in fact impacts of the proposed project or only appear to be impacts because of limitations of the modeling tools; as discussed in Section 5.2.2, these sensitivity studies actually reveal additional adverse impacts to Delta water quality that are not disclosed in the RDEIR/SDEIS.

### *5.2.1. The Determination that the Modeling Previously Conducted for Alternative 4 will Accurately Predict the Environmental Effects of New Alternative 4A Is Unsubstantiated.*

The sensitivity studies intended to support the use of outdated modeling to analyze the impacts of the new alternatives (including Alternative 4A, the new Preferred Alternative) do not address key aspects of the new project as proposed and do not account for the water quality effects that would be caused by the differences between the new and old alternatives. Thus the sensitivity studies do not support use of the old modeling.

The RDEIR/SDEIS states that "the Lead Agencies have determined that they may reasonably rely on the modeling conducted for Alternative 4 to accurately predict the environmental effects of Alternative 4A." RDEIR/SDEIS, Section 4.1.6 at p. 4.1-43. While there are no similar determinations that the Lead Agencies may rely upon the modeling conducted for Alternative 2A at ELT to predict the effects of new Alternative 2D, and upon the modeling conducted for Alternative 5 at ELT to predict the effects of new Alternative 5A, it is evident that the RDEIR/SDEIS relies on the prior modeling to evaluate these new alternatives as well.

The determination that modeling for Alternative 4 will accurately predict the environmental effects of Alternative 4A is based upon Appendix B.1 of the RDEIR/SDEIS, which presents a "brief sensitivity analysis" using the CALSIM II operations model. RDEIR/SDEIS, Appendix B at p. B-1. The sensitivity study incorporates *some* corrections to the modeling assumptions to be consistent with the project description as shown in Table 5-2 below, specifically, removing the 25,000 acres of tidal marsh restoration, removing the Yolo Bypass enhancements, and removing the relaxation of the Emmaton salinity objective. However, the sensitivity study did not correct the modeling assumptions to make them consistent with the project description for the Head of Old River Barrier or the Clifton Court Forebay inflow restrictions. As a result, the sensitivity study does not represent a complete and accurate depiction of the project as it is currently described and proposed in the RDEIR/SDEIS.

**Table 5-2. Comparison between project description of Alternative 4A, the modeling assumptions used for the impact analysis (Alternative 4 at ELT), and the modeling assumptions in the sensitivity study.**

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="3">Alternative 4A</th></tr>
<tr><th>Project Description</th><th>Model used for Impact Analysis (Alternative 4 ELT)</th><th>Model used for Sensitivity Study in Appendix B.1</th></tr>
<tr><td rowspan="2">Climate Change</td><td>Hydrology</td><td>2025 forecast</td><td>2025 forecast</td><td>2025 forecast</td></tr>
<tr><td>Sea Level Rise</td><td>15 cm</td><td>15 cm</td><td>15 cm</td></tr>
<tr><td rowspan="3">2008 USFWS / 2009 NMFS BiOp Requirements</td><td>Fall X2</td><td>yes</td><td>yes</td><td>yes</td></tr>
<tr><td>Tidal Marsh Restoration</td><td>described as part of the No Action baseline and not as part of Alternative 4A</td><td>modeled as part of Alternative 4A</td><td>not modeled as part of the No Action baseline or Alternative 4A</td></tr>
<tr><td>Flood Plain Restoration</td><td>described as part of the No Action baseline and not as part of Alternative 4A</td><td>modeled as part of Alternative 4A</td><td>not modeled as part of the No Action baseline or Alternative 4A</td></tr>
<tr><td rowspan="5">Project Components</td><td>Tidal Marsh Restoration</td><td>59 ac.</td><td>25,000 ac. (inc. BiOp, EcoRestore and add'l 16,000 ac.)</td><td>0 acres</td></tr>
<tr><td>Salinity Objective Compliance Location</td><td>Emmaton</td><td>Three Mile Slough</td><td>Emmaton</td></tr>
<tr><td>Head of Old River Barrier</td><td>potential closure Oct-Nov and Jan-June 15</td><td>50% open during the times assumed to be closed</td><td>50% open during the times assumed to be closed</td></tr>
<tr><td>Suisun Marsh Salinity Control Gates</td><td>operated</td><td>not operated</td><td>not applicable because no Delta modeling was performed</td></tr>
<tr><td>Clifton Court Forebay Inflow</td><td>not mentioned in RDEIR / SDEIS</td><td>10,300 cfs</td><td>10,300 cfs</td></tr>
</table>

Furthermore, the sensitivity study only examined the results of the water supply operations model (CALSIM II) and did not evaluate the changes in Delta flows or water quality that would result from these changes. Since the Delta modeling tools (DSM2 HYDRO, DSM2 QUAL, and DSM2 PTM) were not employed for the sensitivity study, the study does not correct the modeling assumptions to make them consistent with the project description for the operation of the Suisun Marsh Salinity Control Gates.

As a result of all of these factors, the sensitivity study does not support using the old modeling for Alternative 4 to predict the effects on Delta water quality or aquatic resources for Alternative 4A.

In fact, the second set of sensitivity studies presented in the RDEIR/SDEIS (discussed in Section 5.2.2 below) utilized the Delta modeling tools and show that the operational changes in the revised project description do affect water quality. This second set of studies therefore confirms that the outdated modeling used for the 2013 BDCP Draft EIR/EIS cannot be used to accurately reflect the impacts of revised Alternative 4 and the new alternatives.

Furthermore, as discussed in Section 5.3 below, these problems are compounded by the inaccurate representation of Head of Old River Barrier operations in the modeling used for the impacts analysis, which masks potentially significant water quality impacts of the new Preferred Alternative.

### *5.2.2. Water Quality Sensitivity Studies Do Not Demonstrate that Water Quality Impacts Are Less Than Significant*

The second set of sensitivity studies to assess water quality impacts was used only to determine whether the project would exceed water quality standards, and does not address the provisions of the CEQA Guidelines specifying that significant water quality impacts can occur even without violating water quality standards, when the project would "otherwise substantially degrade water quality." The studies themselves demonstrate this problem by revealing that the Preferred Alternative will in fact substantially degrade water quality and have significant water quality impacts that were not reported in the RDEIR/SDEIS.

The RDEIR/SDEIS repeatedly relies on sensitivity studies (presented in RDEIR/SDEIS, Appendix A, Appendix 8H, Attachment 1) for the water quality impacts analysis of Alternatives 2D, 4A, and 5A. For example, in discussion of water quality impacts in the Delta due to changes in electrical conductivity (EC), the RDEIR/SDEIS states:

> [T]he analysis of EC under Alternative 4A is based on modeling conducted for Alternative 4 in the ELT, which assumes implementation of Yolo Bypass Improvements and 25,000 acres of tidal natural communities restoration. Also, the modeling was originally performed assuming the Emmaton compliance point shifted to Threemile Slough. However, Yolo Bypass Improvements are not a component of Alternative 4A and the amount of tidal habitat restoration (i.e., Environmental Commitment 4) would be significantly less than that represented in the Alternative 4A modeling. Also, Alternative 4A does not include a change in compliance point from Emmaton to Threemile Slough. Furthermore, there are several factors related to the modeling approach that may result in modeling artifacts that show objective exceedance, when in reality no such exceedance would

> occur. The result of all of these factors is that the quantitative modeling results presented in this assessment is not entirely predictive of actual effects under Alternative 4A, and the results should be interpreted with caution. In order to understand the significance of all of these factors on the results, sensitivity analyses and other analyses were performed to evaluate the impact of maintaining the compliance point at Emmaton, the impact of having substantially less restoration than included in the modeling that was analyzed, and whether exceedances were indeed modeling artifacts or were potential alternative-related effects that may actually occur. For more information on these sensitivity analyses, refer to Chapter 8, Section 8.3.1.7, Electrical Conductivity, and Appendix 8H Attachment 1, both in Appendix A of the RDEIR/SDEIS.
>
> In this assessment, the modeling results are described and then in most cases are qualified in light of findings from the sensitivity analyses. Conclusions thus represent assessment of the combination of the modeling results and sensitivity analysis findings.

RDEIR/SDEIS Section 4.3.4 at p. 4.3.4-23.

The referenced sensitivity studies evaluate whether changes to the project description for Alternative 4 (such as operation of Suisun Marsh Salinity Control Gates) would reduce the water quality impacts associated with exceedances of salinity objectives. The studies are limited to this one issue and are not used to evaluate any other water quality impacts that could be caused by the new alternatives. But under CEQA, significant water quality impacts can occur without exceeding water quality objectives. This is why the CEQA Guidelines, in assessing whether a project's impacts are significant or not, ask both whether a project would result in a violation of any water quality standards and whether a project would "otherwise substantially degrade water quality." CEQA Guidelines, Appendix G, § IX (Hydrology & Water Quality). In fact, as shown below, the sensitivity studies themselves reveal a substantial degradation of water quality and thus adverse water quality impacts in addition to exceedances of salinity objectives.

The RDEIR/SDEIS' discussion of the sensitivity studies in Appendix A, Appendix 8H, Attachment 1 is limited to analysis of compliance with salinity objectives at the following locations and times:

- Sacramento River at Emmaton (April through August)
- San Joaquin River at San Andreas Landing (April through August)
- Old River at Tracy Road Bridge (year round)
- San Joaquin River at Prisoners Point (April and May)
- Suisun Marsh (year round)

CCWD obtained the complete results of the sensitivity studies from DWR (DWR, 2015) to examine the effects of the project modifications presented in the studies at broader spatial and temporal scales. The results indicate that while these modifications may have the desired effect of reducing violations of salinity standards, they also creates additional impacts that are not disclosed in the RDEIR/SDEIS. Two examples are provided below: (1) Suisun Marsh Salinity Control Gate operations, which keep Suisun March fresh but increase salinity in the Delta; and (2) maintaining the salinity objective at Emmaton, which keeps salinity low in the summer when the Emmaton objective governs operations but raises Delta salinity in the fall and winter.

## 1. Suisun Marsh Salinity Control Gate Operations

The project description for the revised Alternative 4 and the new alternatives includes operations of the Suisun Marsh Salinity Control Gates (SMSCG). However, the modeling that is used as the basis for the impacts analysis assumes no operation of the SMSCG. The RDEIR/SDEIS presents limited results from a sensitivity study that was designed to determine how operation of the SMSCG would alter Delta salinity. The study found that SMSCG operation freshens Suisun Marsh. However, the RDEIR/SDEIS does not disclose the effects that SMSCG operation would have outside of Suisun Marsh, in Suisun Bay and the Delta. The results of the sensitivity studies provided by DWR indicate that operating the SMSCG as proposed for the new alternatives is likely to create water quality impacts by increasing salinity throughout the Delta from October through March.

Operation of the gates creates a net flow of fresh water from the Sacramento River near Collinsville into Suisun Marsh equivalent to about 2,800 cubic feet per second (cfs), thus reducing salinity within Suisun Marsh (Enright, 2008, slide 40). The RDEIR/SDEIS contains graphs showing the reduction in salinity within Suisun Marsh in response to operation of the gates. RDEIR/SDEIS, Appendix A, Appendix 8H, Attachment 1 at p. 10 (Figures 9 and 4).

However, diversions of the freshwater into Suisun Marsh via operation of SMSCG *increase* salinity in Suisun Bay and the western Delta (Enright, 2008, slides 43 and 44). The RDEIR/SDEIS does not disclose the degradation in water quality that SMSCG operation would have within Suisun Bay or the Delta. Figure 5-2 below shows changes in salinity in the western Delta at Collinsville that are caused by SMSCG operations. The increase in salinity from October through March is an effect of project operations that is not captured by the outdated modeling that was used to evaluate water quality impacts.

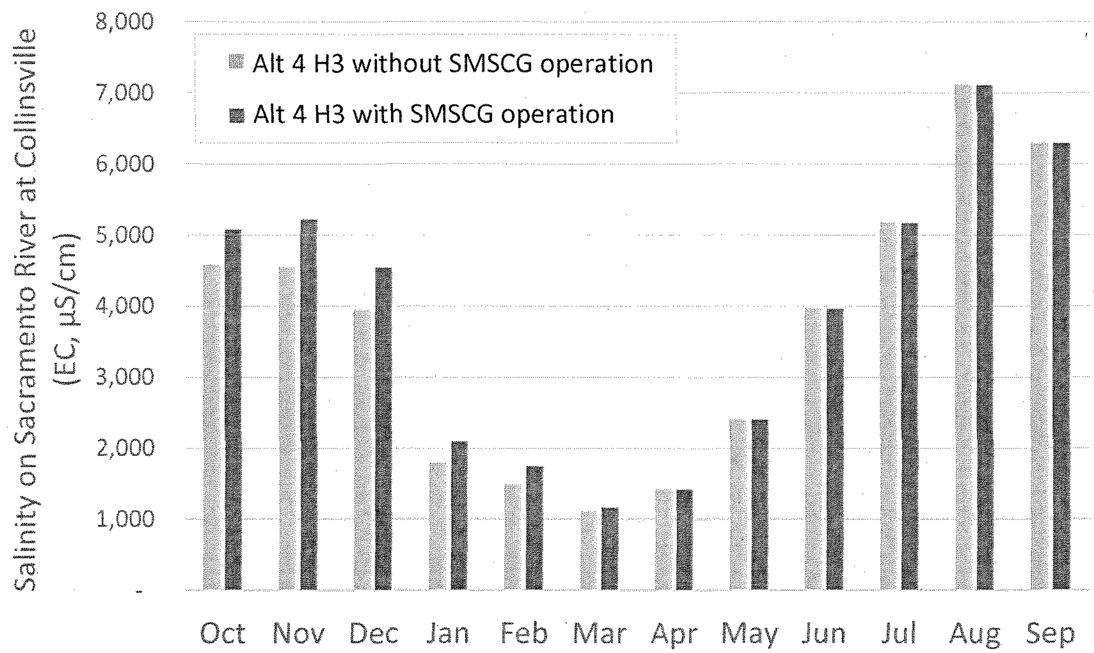


**Figure 5-2. Monthly Average Salinity at Collinsville both with and without operation of the SMSCG**
Date source: modeling results from the sensitivity studies in described in RDEIR/SDEIS, Appendix A, Appendix 8H, Attachment 1 and provided by DWR (DWR, 2015).

Table 5-3 below illustrates the average monthly change in salinity at locations throughout the Delta due to operation of the SMSCG as specified in the sensitivity studies provided by DWR. The table is modeled after the tables in Appendix B to the RDEIR/SDEIS that are referenced in the water quality impacts sections, and provides a summary of the changes for each month at multiple locations within the Delta.

In sum, the results of the sensitivity studies provided by DWR indicate that operating the SMSCG as proposed for the new alternatives is likely to increase salinity throughout the Delta from October through March relative to not operating the SMSCG. But as noted above, the modeling used in the impacts analysis for the new alternatives did not include operation of the SMSCG. As a result, the modeling underestimates the project's impacts to salinity throughout the Delta, with the greatest underestimation occurring in the western Delta.

**Table 5-3. Effect of operating the Suisun Marsh Salinity Control Gates.**
Average monthly change in salinity (indicated by modeled electrical conductivity in µS/cm) and average monthly percent change for all 16-years of model results for Alt 4 H3 at LLT using the monthly model inputs. Red shading indicates increases in the average percent change. Source: Results from the sensitivity studies described in RDEIR/SDEIS Appendix A, Appendix 8H, Attachment 1 and provided by DWR (DWR, 2015).

| | | | Monthly Average (all years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region | Location | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| Western Delta | Sacramento River at Mallard Slough | Change | 703 | 817 | 777 | 462 | 369 | 75 | 1 | 0 | 4 | 5 | 16 | 11 |
| | | % Change | 10% | 12% | 10% | 10% | 8% | 2% | (-0%) | (-0%) | 0% | 0% | 0% | 0% |
| | Sacramento River at Collinsville | Change | 489 | 674 | 600 | 298 | 255 | 55 | -3 | -6 | -7 | -11 | -7 | -7 |
| | | % Change | 12% | 15% | 13% | 12% | 10% | 3% | (-0%) | (-0%) | (-0%) | (-0%) | (-0%) | (-0%) |
| | Sacramento River at Emmaton | Change | 78 | 191 | 141 | 48 | 44 | 12 | 0 | -2 | -3 | -5 | -6 | -4 |
| | | % Change | 6% | 11% | 11% | 7% | 6% | 2% | 0% | (-0%) | (-0%) | (-0%) | (-0%) | (-0%) |
| | San Joaquin River at Antioch | Change | 217 | 435 | 409 | 174 | 136 | 43 | -1 | -4 | -7 | -13 | -13 | -10 |
| | | % Change | 9% | 14% | 13% | 12% | 9% | 4% | (-0%) | (-0%) | (-0%) | (-0%) | (-0%) | (-0%) |
| | San Joaquin River at Jersey Point | Change | 14 | 98 | 120 | 47 | 21 | 10 | 2 | 0 | -1 | -4 | -5 | -3 |
| | | % Change | 1% | 6% | 10% | 7% | 4% | 2% | 1% | 0% | (-0%) | (-0%) | (-0%) | (-0%) |
| Lower SacR | Sacramento River at Three Mile Slough | Change | 39 | 112 | 78 | 24 | 22 | 7 | 0 | -1 | -2 | -3 | -3 | -2 |
| | | % Change | 4% | 9% | 9% | 5% | 4% | 2% | 0% | (-0%) | (-0%) | (-0%) | (-0%) | (-0%) |
| | Sacramento River at Rio Vista | Change | 4 | 19 | 14 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | % Change | 1% | 4% | 3% | 1% | 1% | 0% | 0% | 0% | (-0%) | (-0%) | (-0%) | (-0%) |
| Lower SJR | San Joaquin River at San Andreas Landing | Change | -1 | 17 | 34 | 18 | 7 | 3 | 1 | 1 | 0 | -1 | -2 | -2 |
| | | % Change | (-0%) | 2% | 6% | 4% | 2% | 1% | 0% | 0% | 0% | (-0%) | (-0%) | (-0%) |
| | San Joaquin River at Prisoner's Point | Change | -1 | 7 | 23 | 14 | 5 | 2 | 1 | 0 | 0 | 0 | -1 | -1 |
| | | % Change | (-0%) | 1% | 4% | 3% | 1% | 0% | 0% | 0% | 0% | (-0%) | (-0%) | (-0%) |
| CCWD Intakes | Sacramento River at Mallard Slough | Change | 703 | 817 | 777 | 462 | 369 | 75 | 1 | 0 | 4 | 5 | 16 | 11 |
| | | % Change | 10% | 12% | 10% | 10% | 8% | 2% | (-0%) | (-0%) | 0% | 0% | 0% | 0% |
| | Old River at Rock Slough | Change | -1 | 11 | 37 | 28 | 10 | 5 | 2 | 1 | 0 | 0 | -1 | -2 |
| | | % Change | (-0%) | 1% | 5% | 5% | 2% | 1% | 0% | 0% | 0% | (-0%) | (-0%) | (-0%) |
| | Old River at Highway 4 | Change | -1 | 5 | 24 | 21 | 9 | 4 | 2 | 1 | 0 | 0 | -1 | -1 |
| | | % Change | (-0%) | 1% | 4% | 4% | 2% | 1% | 0% | 0% | 0% | (-0%) | (-0%) | (-0%) |
| | Victoria Canal | Change | 0 | 1 | 5 | 8 | 5 | 3 | 2 | 1 | 1 | 0 | 0 | 0 |
| | | % Change | (-0%) | 0% | 1% | 2% | 1% | 0% | 0% | 0% | 0% | 0% | (-0%) | (-0%) |

**2. Salinity Objective at Emmaton**

As discussed above, the project descriptions for the revised Alternative 4 and the new alternatives includes maintaining compliance with the salinity objective at Emmaton. However, the modeling that is used as the basis for the impacts analysis does not maintain compliance of the salinity objective at Emmaton, but rather moves the salinity objective upstream to Three Mile Slough. The RDEIR/SDEIS discusses the reductions in Delta salinity in the summer that are expected due to maintaining compliance at Emmaton, but does not disclose the resulting increase to salinity in the fall and winter.

Maintaining compliance at Emmaton (consistent with the project description) instead of moving the salinity objective to Three Mile Slough (consistent with the impacts analysis), would reduce salinity at Emmaton from April through August when the salinity objective is assumed to be in effect each year. Maintaining compliance also reduces yield of the project during those months, triggering operational changes during other months to recover the lost yield. The net effect of maintaining compliance with the salinity object at Emmaton is a reduction in salinity in the spring and summer, which is illustrated in the RDEIR/SDEIS, with an increase in salinity in the fall and winter, which is not disclosed in the RDEIR/SDEIS.

Table 5-4 below shows the average monthly change in salinity at locations throughout the Delta from the sensitivity studies provided by DWR (DWR, 2015). The results confirm that maintaining compliance of the salinity objective at Emmaton as proposed for the new alternatives is likely to increase salinity throughout the Delta from October through March while reducing salinity from April through September. The RDEIR/SDEIS refers to the expected reduction in salinity in the summer to dismiss water quality impacts identified in the modeling results; however, the RDEIR/SDEIS does not disclose the expected increase in salinity in the fall and winter.

By not including the salinity objective at Emmaton, the modeling for the new alternatives understates the salinity impacts from the project throughout the Delta from October to March. This is the same period that the project's salinity impacts are also underestimated due to the failure of the modeling to include operation of the Suisun Marsh Salinity Control Gates, as described above. Each modeling error thus compounds the other, resulting in a deficient analysis that fails to disclose or evaluate the true magnitude of the project's impacts on salinity levels.

**Table 5-4. Effect of not relaxing the salinity objective compliance location at Emmaton.** Change in salinity (indicated by modeled electrical conductivity in μS/cm) and percent change for (a) all 16-years of model results; (b) dry years (water years 1987 to 1991) for Alt 4 H3 at LLT using the monthly model inputs. Source: Results from sensitivity studies described in RDEIR/SDEIS Appendix A, Appendix 8H, Attachment 1 and provided by DWR (DWR, 2015).

(a)

| | | | Monthly Average (all years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region | Location | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| Western Delta | Sacramento River at Mallard Slough | Change | 221 | 173 | 246 | 415 | 226 | 14 | -55 | -307 | -435 | -208 | -282 | -127 |
| | | % Change | 4% | 2% | 4% | 13% | 5% | 1% | (-1%) | (-6%) | (-7%) | (-3%) | (-2%) | (-1%) |
| | Sacramento River at Collinsville | Change | 179 | 111 | 169 | 290 | 144 | -2 | -40 | -199 | -335 | -147 | -288 | -113 |
| | | % Change | 6% | 3% | 5% | 15% | 5% | 1% | (-1%) | (-8%) | (-8%) | (-4%) | (-4%) | (-1%) |
| | Sacramento River at Emmaton | Change | 61 | 16 | 26 | 86 | 34 | -5 | -10 | -34 | -123 | -57 | -197 | -58 |
| | | % Change | 9% | 5% | 6% | 15% | 4% | 0% | (-2%) | (-8%) | (-11%) | (-4%) | (-7%) | (-1%) |
| | San Joaquin River at Antioch | Change | 113 | 45 | 95 | 161 | 89 | -5 | -20 | -99 | -215 | -83 | -209 | -113 |
| | | % Change | 4% | 3% | 4% | 11% | 6% | 1% | (-1%) | (-9%) | (-10%) | (-4%) | (-4%) | (-1%) |
| | San Joaquin River at Jersey Point | Change | 24 | -20 | 37 | 27 | 23 | 3 | 0 | -10 | -48 | -7 | -33 | -47 |
| | | % Change | 2% | 3% | 4% | 4% | 4% | 1% | (-0%) | (-3%) | (-7%) | (-2%) | (-2%) | (-1%) |
| Lower SacR | Sacramento River at Three Mile Slough | Change | 33 | 3 | 9 | 51 | 19 | -3 | -5 | -15 | -79 | -40 | -142 | -41 |
| | | % Change | 9% | 5% | 5% | 12% | 3% | (-0%) | (-1%) | (-6%) | (-10%) | (-4%) | (-8%) | (-1%) |
| | Sacramento River at Rio Vista | Change | 2 | -2 | -1 | 11 | 3 | 0 | 0 | -1 | -20 | -13 | -39 | -13 |
| | | % Change | 2% | 2% | 1% | 4% | 1% | (-0%) | (-0%) | (-1%) | (-5%) | (-3%) | (-8%) | (-1%) |
| Lower SJR | San Joaquin River at San Andreas Landing | Change | 2 | -10 | 11 | 15 | 11 | 4 | 1 | -3 | -12 | -11 | -14 | -15 |
| | | % Change | 0% | 1% | 3% | 3% | 3% | 1% | 0% | (-1%) | (-3%) | (-2%) | (-2%) | (-1%) |
| | San Joaquin River at Prisoner's Point | Change | 1 | -11 | 11 | 11 | 12 | 5 | 0 | -1 | -6 | -8 | 3 | -8 |
| | | % Change | 0% | (-1%) | 3% | 2% | 3% | 1% | 0% | (-0%) | (-1%) | (-2%) | 1% | (-1%) |
| CCWD Intakes | Sacramento River at Mallard Slough | Change | 221 | 173 | 246 | 415 | 226 | 14 | -55 | -307 | -435 | -208 | -282 | -127 |
| | | % Change | 4% | 2% | 4% | 13% | 5% | 1% | (-1%) | (-6%) | (-7%) | (-3%) | (-2%) | (-1%) |
| | Old River at Rock Slough | Change | -2 | -3 | 0 | 11 | 14 | 8 | 2 | 0 | -6 | -14 | 4 | -19 |
| | | % Change | 1% | 1% | 2% | 2% | 3% | 2% | 0% | 0% | (-2%) | (-3%) | 1% | (-2%) |
| | Old River at Highway 4 | Change | -5 | -1 | 4 | 11 | 14 | 9 | 3 | 2 | -3 | -11 | 6 | -9 |
| | | % Change | (-0%) | 0% | 2% | 2% | 3% | 2% | 1% | 0% | (-1%) | (-2%) | 1% | (-1%) |
| | Victoria Canal | Change | -4 | -3 | 12 | 6 | 1 | 4 | 4 | 2 | -1 | -11 | -2 | -3 |
| | | % Change | (-1%) | (-1%) | 3% | 2% | 0% | 1% | 1% | 0% | (-0%) | (-3%) | (-0%) | (-0%) |

(b)

| | | | Monthly Average (drought years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region | Location | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| Western Delta | Sacramento River at Mallard Slough | Change | 482 | 518 | 138 | 307 | 284 | 44 | 10 | -252 | -243 | -146 | -401 | -336 |
| | | % Change | 5% | 5% | 2% | 5% | 4% | 3% | 0% | (-5%) | (-3%) | (-1%) | (-3%) | (-3%) |
| | Sacramento River at Collinsville | Change | 453 | 461 | 81 | 257 | 224 | 24 | 8 | -171 | -191 | -145 | -428 | -313 |
| | | % Change | 7% | 7% | 3% | 7% | 5% | 2% | 0% | (-7%) | (-4%) | (-2%) | (-5%) | (-3%) |
| | Sacramento River at Emmaton | Change | 200 | 217 | 2 | 103 | 78 | 5 | 2 | -34 | -84 | -112 | -309 | -161 |
| | | % Change | 12% | 10% | 5% | 9% | 7% | 1% | 0% | (-7%) | (-5%) | (-5%) | (-11%) | (-5%) |
| | San Joaquin River at Antioch | Change | 356 | 403 | 34 | 170 | 176 | 22 | 6 | -88 | -122 | -75 | -309 | -310 |
| | | % Change | 8% | 9% | 3% | 8% | 7% | 3% | 1% | (-7%) | (-4%) | (-1%) | (-5%) | (-4%) |
| | San Joaquin River at Jersey Point | Change | 94 | 169 | 49 | 30 | 48 | 10 | 3 | -9 | -28 | 18 | -35 | -154 |
| | | % Change | 6% | 13% | 5% | 5% | 7% | 3% | 1% | (-3%) | (-4%) | 2% | (-2%) | (-6%) |
| Lower SacR | Sacramento River at Three Mile Slough | Change | 126 | 146 | -3 | 65 | 47 | 3 | 1 | -16 | -59 | -84 | -224 | -111 |
| | | % Change | 12% | 11% | 6% | 9% | 6% | 1% | 0% | (-5%) | (-5%) | (-6%) | (-13%) | (-5%) |
| | Sacramento River at Rio Vista | Change | 22 | 36 | -2 | 16 | 9 | 1 | 0 | -1 | -19 | -28 | -67 | -30 |
| | | % Change | 7% | 8% | 2% | 4% | 3% | 0% | 0% | (-1%) | (-4%) | (-6%) | (-14%) | (-5%) |
| Lower SJR | San Joaquin River at San Andreas Landing | Change | 23 | 56 | 50 | 17 | 15 | 4 | 1 | -1 | -8 | -8 | -21 | -47 |
| | | % Change | 4% | 10% | 9% | 4% | 4% | 1% | 0% | (-0%) | (-2%) | (-1%) | (-3%) | (-5%) |
| | San Joaquin River at Prisoner's Point | Change | -1 | 28 | 57 | 24 | 8 | 1 | 1 | 1 | -5 | 0 | 9 | -30 |
| | | % Change | (-0%) | 6% | 11% | 5% | 2% | 0% | 0% | 0% | (-1%) | 0% | 1% | (-4%) |
| CCWD Intakes | Sacramento River at Mallard Slough | Change | 482 | 518 | 138 | 307 | 284 | 44 | 10 | -252 | -243 | -146 | -401 | -336 |
| | | % Change | 5% | 5% | 2% | 5% | 4% | 3% | 0% | (-5%) | (-3%) | (-1%) | (-3%) | (-3%) |
| | Old River at Rock Slough | Change | -22 | 46 | 62 | 20 | 10 | 7 | 3 | 3 | -3 | -4 | 6 | -42 |
| | | % Change | (-2%) | 8% | 9% | 4% | 3% | 2% | 1% | 1% | (-1%) | (-0%) | 1% | (-5%) |
| | Old River at Highway 4 | Change | -22 | 24 | 65 | 34 | 7 | 6 | 6 | 5 | -3 | -4 | 11 | -23 |
| | | % Change | (-3%) | 4% | 11% | 6% | 2% | 1% | 1% | 1% | (-0%) | (-1%) | 2% | (-3%) |
| | Victoria Canal | Change | -8 | -2 | 50 | 21 | 17 | 9 | 7 | 5 | 0 | -13 | 1 | -1 |
| | | % Change | (-1%) | (-0%) | 10% | 5% | 3% | 2% | 1% | 1% | 0% | (-3%) | 0% | (-0%) |

### *5.3. The Descriptions of Head of Old River Barrier Operation and South Delta Flow Requirements Are Internally Inconsistent and the Modeling Workaround to Address this Inconsistency Underestimates the Project's Impacts*

As discussed in Section 3.2 above, the description of the revised Alternative 4 and the new Preferred Alternative, Alternative 4A, includes requirements for positive net flows in Old and Middle River at times when the Head of Old River Barrier is closed, even though this is not physically possible. As described below, as a result of this consistency, the project's water quality impacts are not adequately disclosed and evaluated.

Closure of the HORB impacts the water quality in the south and central Delta; Figure 5-3 shows the geographical extent of the impacts in wet and dry years.

When the HORB is closed, flow from the San Joaquin River is prevented from entering the south Delta at Old River. During wet years, the project description specifies that OMR should be positive for much of the winter and spring. However, as discussed above, OMR cannot be positive with HORB closed; in order to prevent negative OMR during HORB closure, the south Delta export facilities would reduce diversions beyond what is modeled for Alternatives 4/4A and 2A/2D. With no positive flow into Old and Middle Rivers from the San Joaquin River and no negative flow in Old and Middle Rivers caused by operation of the south Delta export facilities, OMR would approach zero, creating stagnant conditions in the south and central Delta (indicated by the green shading in Figure 5-3(a)) and depriving these areas of water from the San Joaquin River, which during wet years is typically of very good quality.

During dry years, the project as described in the RDEIR/SDEIS allows OMR to be negative while the HORB is closed. With no flow entering Old River from the San Joaquin River at the HORB, and with the export pumps operating, the San Joaquin River would flow north past the HORB, then turn south entering Old and Middle Rivers from the north and creating negative OMR (Figure 5-3(b)). The central Delta would receive this water heading from the north, and thus would receive a greater proportion of San Joaquin River water as compared to baseline conditions. This is an important consideration for water quality in the central Delta, since during dry years, San Joaquin River flows are generally low and the water quality is poor. Further, with the HORB closed, stagnant conditions would be created in the south Delta.

For both wet and dry years, impacts would be greater than what is modeled. In the stagnant regions, flow in the channels would oscillate with the tides, but without net flow, the residence time would be very long. (Residence time is estimated by the volume of water in a region divided by the net flow through the region, so as the net flow approaches zero, the residence time approaches infinity.) Long residence times provide optimal conditions for harmful algal blooms as discussed in Section 2.2.1.2 of CCWD's July 25, 2014 comment letter on the 2013 BDCP Draft EIR/EIS.

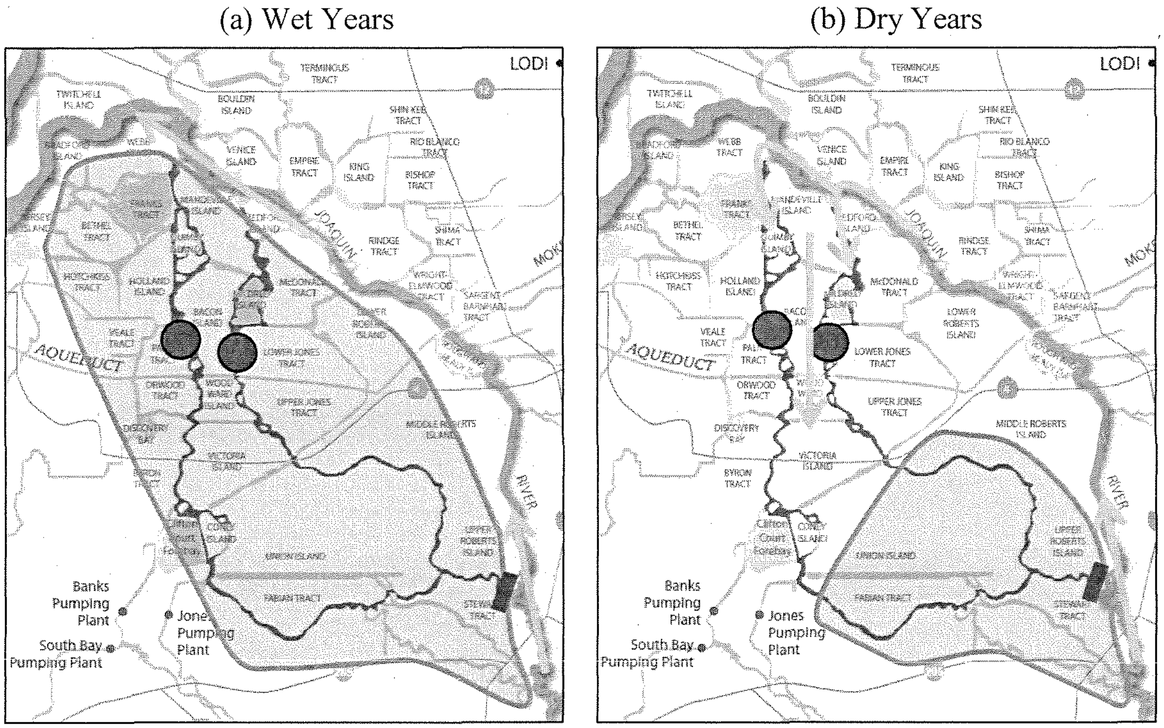


**Figure 5-3. HORB affects water quality in the south and central Delta**
Closure of the HORB prevents the San Joaquin River from entering Old River in the south Delta, creating a stagnant region to the west of the HORB (green shading). The extent of the stagnant region is dependent on the OMR regulations. In relatively wet years (a), the project description often requires OMR to be positive, preventing any flow from the north from entering the region and expanding the stagnant zone throughout the south and central Delta southwest of the San Joaquin River. In relatively dry years (b), the project description allows OMR to be negative, allowing CVP and SWP pumping in the south Delta and causing the San Joaquin River to turn south and enter Old and Middle Rivers from the north.

CCWD conducted a sensitivity study to evaluate the degree to which the analysis in the RDEIR/SDEIS underestimates the impacts of the new alternatives. Unlike the modeling used for the impact analysis in the RDEIR/SDEIS, CCWD's sensitivity study assumes that the HORB is closed when the project description indicates it should be closed. The CCWD study also reduced south Delta exports if necessary to attempt to meet the OMR requirement. Note that because no parameters are indicated in the project description to open the HORB for water quality or water stage concerns, this was not simulated in the CCWD study. Figure 5-4 illustrates the results for three wet years (Figure 5-4(a)) and three dry years (Figure 5-4(b)). In all six years, the negative water quality effects of the proposed project are greater than what is disclosed and evaluated in the RDEIR/SDEIS.

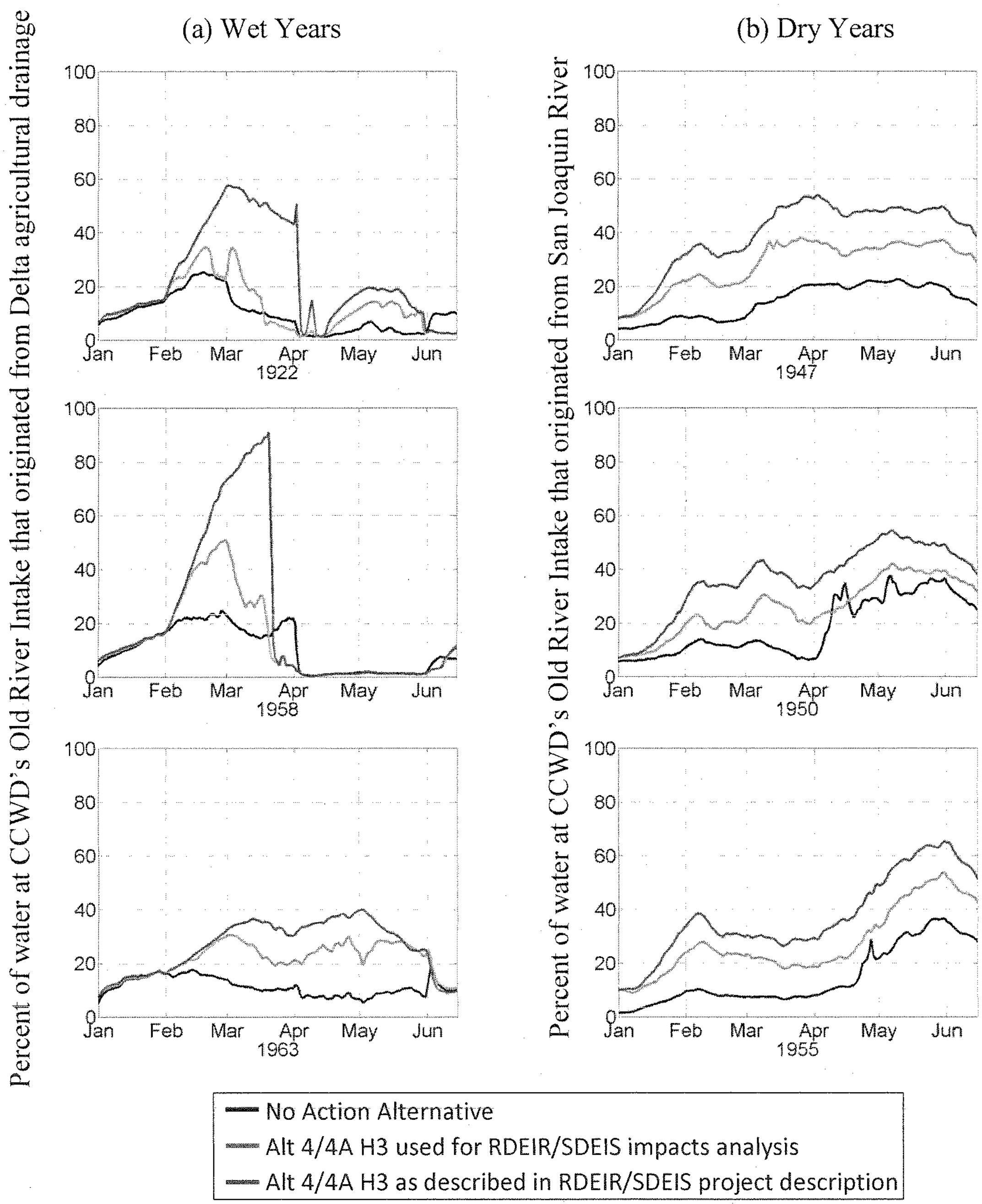


**Figure 5-4. HORB affects water quality in the south and central Delta, sensitivity study results**

Results of CCWD's sensitivity study (red lines) indicate that the modeling used for the RDEIR/SDEIS impacts analysis (green lines) underestimate the project's adverse impacts on water quality relative to the baseline (black lines). In relatively wet years (a), an increase in percent of water from Delta agricultural drainage would increase salinity, nutrients, algal biomass, and pesticides at CCWD's intakes. In relatively dry years (b), an increase in the percent of water from the San Joaquin River would increase salinity, nutrients, and pesticides at CCWD's intakes.

During wet years, the percent of water diverted at CCWD's Old River Intake that would originate from Delta agricultural drainage increases with the project, reaching as high as 90%. When there is net flow – either positive or negative – in Old River, the agricultural drainage that enters the river is carried away from the south Delta. Conversely, the buildup of agricultural drainage is an indicator of a lack of flow with increased residence time, which is likely to lead to increased algal growth with its attendant operational, taste and odor, and public health impacts as discussed in Section 2.2.1.2 of CCWD's July 25, 2014 comment letter.

During dry years, the percent of water diverted at CCWD's Old River Intake that would originate from the San Joaquin River increases, increasing CCWD's source water salinity. The modeling for the RDEIR/SDEIS, which does not include HORB operations that match the project description, misses this effect and underestimates water quality impacts.

# 6. The Mitigation in the RDEIR/SDEIS Is Inadequate

The RDEIR/SDEIS states that the new alternatives (Alternatives 4A, 2D and 5A) would eliminate almost all of the significant environmental impacts associated with Alternative 4, the previous Preferred Alternative. For the new alternatives, the RDEIR/SDEIS identifies only one significant water quality impact, from increased concentrations of electrical conductivity (EC), and two water quality mitigation measures, WQ-11a and WQ-11b. RDEIR/SDEIS, Sections 4.3.4 (Alternative 4A), 4.4.4 (Alternative 2D) and 4.5.4 (Alternative 5A). This approach is incorrect for several reasons.

First, as described in detail in Section 5 of these comments, the modeling that forms the basis of the impact analyses is fundamentally flawed. The inputs to the modeling of the three new alternatives do not match the descriptions of those alternatives in crucial respects. The result is an analysis that systematically obscures and underestimates impacts. Therefore, the project proponents have no basis to conclude that Alternatives 4A, 2D and 5A would not have significant water quality impacts. As described in the sections above, the new alternatives would in fact have significant water quality impacts. Accordingly, legally adequate mitigation must be identified for the true water quality impacts of Alternatives 4A, 2D and 5A as well as Alternative 4; the defects in the mitigation proposed in the 2013 BDCP Draft EIR/EIS were described in detail in Section 3 of CCWD's July 25, 2014 comment letter.

With respect to bromide, the analysis of Alternatives 4A, 2D and 5A contains the same error as the analysis of Alternative 4. Specifically, the analysis assumes that because water purveyors' use of the Mallard Slough intake is "opportunistic," the alternatives' impact on the number of days when the intake is unavailable does not constitute a significant environmental impact. RDEIR/SDEIS, Section 4.3.4 at pp. 4.3.4-9 to 4.3.4-10 (Alternative 4A); Section 4.4.4 at p. 4.4.4-9 (Alternative 2D); and Section 4.5.4 at p. 4.5.3-9 (Alternative 5A). For the reasons described in Section 3 of CCWD's July 25, 2014 comment letter, this conclusion is inaccurate and adequate mitigation must be identified for the significant bromide impacts of the new alternatives.

Finally, the RDEIR/SDEIS identifies two new mitigation measures for the one acknowledged water quality impact of new Alternatives 4A, 2D and 5A. The EC water quality mitigation measures for Alternative 4A are WQ-11a (Adaptively Manage Diversions at the North and South Delta Intakes to Reduce or Eliminate Water Quality Degradation in Western Delta) and WQ-11b (Adaptively Manage Head of Old River Barrier and Diversions at the North and South Delta Intakes to Reduce or Eliminate Exceedances of the Bay-Delta WQCP Objective at Prisoners Point). RDEIR/SDEIS, Section 4.3.4 at pp. 4.3.4-30 to 4.3.4-31. Because these mitigation measures do not set performance standards for water quality at or near CCWD intakes that meet CEQA or NEPA requirements (*see* Section 3 of CCWD's July 25, 2014 comment letter), they must be revised to provide such actual mitigation.

# 7. Alternatives Previously Eliminated from Detailed Consideration Need to be Reevaluated Given the Change in Project Objectives

The revised environmental analysis includes a change in the project objectives. *Compare* the 2013 BDCP Draft EIR/EIS, Chapter 2 at p. 2-2 to 2-4 *with* the July 2015 BDCP RDEIR/SDEIS, Section 1.1.4 at pp. 1-8 to 1-9. In particular, the initial project objectives cited the need to comply with Section 10(a)(1)(B) of the Endangered Species Act (ESA), 16 U.S.C. § 1539(a)(1)(B), which authorizes the U.S. Fish & Wildlife Service to issue an incidental take permit for listed species pursuant to a habitat conservation plan. 2013 BDCP Draft EIR/EIS, Chapter 2 at p. 2-3. The initial project objectives also cited the goal of ensuring that "the BDCP meets the standards for an NCCP [natural communities conservation plan]." *Id.* For these reasons, the 2013 environmental analysis made clear that "the BDCP is a joint HCP/NCCP intended to address ESA [Endangered Species Act] and NCCPA [Natural Community Conservation Planning Act] compliance..." *Id.*, Executive Summary at p. ES-13.

But under the revised project objectives, there is no longer any reference to the HCP provisions of Section 10 of the ESA. RDEIR/SDEIS, Section 1.1.4.1 at pp. 1-8 to 1-9. Similarly, the revised objectives no longer refer to the goal of ensuring that "the BDCP meets the standards for an NCCP." *Id.* Consistent with this substantial change in the project objectives, the revised environmental analysis explains that the three new alternatives (Alternatives 4A, 2D and 5A) "would not serve as habitat conservation plans/natural community conservation plans (HCPs/NCCPs) under ESA Section 10 and the NCCPA," and would not include the extensive set of habitat restoration actions that have been proposed as part of the other 15 alternatives. *Id.*, Section 4.1 at pp. 4.1-1.

The revision of the project objectives in the RDEIR/SDEIS should have led to a reconsideration of those alternatives that previously were eliminated from the analysis on the ground that they did not meet the prior project objectives. For example, the "Portfolio" alternative – the consideration of which has been urged by a broad range of water districts, municipalities, environmental organizations, business groups, and elected officials – was excluded from the initial environmental analysis on the ground that it was beyond the scope of the former project objective of developing a Delta-focused habitat conservation plan and natural communities conservation plan. 2013 BDCP Draft EIR/EIS, Appendix 3A at p. 3A-81. In particular, the prior analysis stated that while there is "much merit" to the Portfolio alternative, this alternative "does not qualify as an EIR/EIS alternative for the BDCP, as its scope is far greater than can be achieved through *a Delta-focused HCP/NCCP*." *Id.* (emphasis added).

But the project objective of developing an HCP/NCCP has now been abandoned. As a result, the environmental analysis needs to reexamine the Portfolio alternative, and other previously screened out alternatives, in light of the change in project objectives.

The Portfolio alternative would involve a 3,000 cfs north Delta intake and a single tunnel sized for 3,000 cfs gravity flow, with increased water storage south of the Delta, enhanced water recycling and conservation, and improvements to Delta levees (The Bay Institute et al., 2013). The alternative could substantially improve the reliability of water supplies for those who depend on Delta exports, while at the same time significantly reducing the environmental impacts of the proposed project and its enormous financial costs.

One of the fundamental purposes of the project objectives is to assist in defining the range of alternatives that must be studied. As the CEQA Guidelines explain, an EIR must evaluate a range of reasonable alternatives that would feasibly attain most of the basic objectives of the project while avoiding or substantially lessening the project's significant impacts. CEQA Guidelines § 15126.6(a), (c). Here, the Portfolio alternative was eliminated from detailed consideration on the ground that it did not conform to the project objective of the BDCP serving as a habitat conservation plan and natural communities conservation plan. But now that this objective has changed, the Portfolio alternative must be reexamined in light of the new project objectives. Without this reexamination, the decision-makers and the public lack sufficient information to assess whether there are feasible ways of achieving the new objectives while reducing the BDCP's significant impacts.

The failure to conduct this reexamination is compounded by the fact that the RDEIR/SDEIS does not clearly identify the revisions to the project objectives. While the document presents redlined versions of the various environmental analyses to show what the text changes are compared to the 2013 BDCP Draft EIR/EIS, no such redline is presented to show the change in the project objectives. Instead, the reader must compare the two different versions of the project objectives to ascertain what the specific text changes are. This has the effect of masking the important changes to the objectives, which further hampers informed governmental decision-making and public participation on the critical issue of alternatives, which constitutes the heart of the environmental analysis.

# 8. The Presentation of Information in the RDEIR/SDEIS Is Highly Confusing, Precluding Informed Decision-Making and Meaningful Public Participation

CEQA states that an EIR should be organized and written in a manner that will make the information "meaningful and useful to the decision-makers and to the public." Pub. Res. Code § 21003(b). The CEQA Guidelines reinforce this principle, stating that EIRs should be written in plain language "so that decision-makers and the public can rapidly understand the documents. CEQA Guidelines § 15140. Similarly, under NEPA, federal agencies are directed to use plain language and to follow a clear format when preparing an EIS, so that the environmental analyses can be readily understood by the public. 40 C.F.R. §§ 1500.4(d), (e), 1502.8.

The RDEIR/SDEIS fails to comport with these important principles. The presentation of information is confusing and is not susceptible to being readily understood even by experts, let alone by members of the general public.

The water quality impact analysis is one example of this problem. Chapter 8 of the 2013 BDCP Draft EIR/EIS contains a water quality analysis for the initial set of alternatives. Some portions of this analysis have been revised, while other portions have not changed. Appendix A to the RDEIR/SDEIS contains a partial version of Chapter 8, which shows those parts of the chapter that have been revised. This version of Chapter 8, however, does not contain the parts of the chapter that have not been revised. Further, there is no way of knowing in advance – without actually reviewing the new partial version of Chapter 8 – which specific portions of the analysis have been revised and which portions have not changed. In addition, some of the section numbers have been modified; for instance, Section 8.2 of the 2013 document ("Environmental Setting/Affected Environment," *see* 2013 BDCP Draft EIR/EIS, Chapter 8, Section 8.2 at p. 8-5) is now Section 8.1 (*see* RDEIR/SDEIS, Section 8.1 at p. 8-3). Moreover, there is an entirely new chapter of the RDEIR/SDEIS, entitled "Section 4," that contains the evaluation of all of the environmental impacts for the three new alternatives, including water quality effects.

The result is that if a reader wishes to conduct a comparative review of the water quality impacts of the different alternatives, he or she must first review the revised version of Chapter 8 to ascertain which portions of the prior water quality analysis have been revised; then review the old version of Chapter 8 to read the portions that have not changed, while accounting for the different section numbers between the two versions of the chapter to piece them together in a coherent fashion; then review the water quality portions of the environmental analyses in Section 4 for the three new alternatives.

The RDEIR/SDEIS contains a one-page "Document Review Road Map," but this brief diagram does little to help the reader to decipher this extraordinarily complicated format. Rather, to truly understand the water quality analysis for this project, an intensive side-by-side review of three different voluminous documents (old Chapter 8, revised Chapter 8, and the water quality portions of new Section 4) is required. And this discussion is limited to one impact – water quality. The various other discussions and analyses in the environmental document suffer from similar problems.

Indeed, the same problem exists for the draft BDCP document itself: Appendix D to the RDEIR/SDEIS shows the revisions to the 2013 draft of the BDCP, but as with the environmental analyses, this appendix does not contain portions of the draft BDCP document that have not been revised. So, again, if a reader wishes to engage in a thorough review of the project that is being proposed for approval, he or she must sift through two different documents (the initial draft BDCP and Appendix D to the RDEIR/SDEIS), side by side, to determine what the details of the proposed project are.

Not surprisingly, this complicated presentation format has generated substantial confusion among those trying to ascertain the details of the proposed project and its environmental impacts. This substantial confusion impedes a fundamental goal of the environmental review – to present a clear and cogent analysis so that the decision-makers and the public can readily understand it. This is another flaw in the RDEIR/SDEIS warranting revision and recirculation.

The Executive Summary of the RDEIR/SDEIS also is problematic. Under CEQA, an EIR must include a summary. CEQA Guidelines § 15123. NEPA contains a similar requirement. 40 C.F.R. § 1502.12 ("Each environmental impact statement shall contain a summary which adequately and accurately summarizes the statement."). Given the length, complexity and confusing organization of the RDEIR/SDEIS, the 105-page "Executive Summary" is especially important; in all likelihood, this is the only section of the RDEIR/SDEIS that most reviewers will read. Nevertheless, even looking at only one environmental topic – water quality – when the Executive Summary is compared to the impact analysis in the remainder of the document, it becomes clear that the Executive Summary is not accurate and consistently understates the significance of the environmental impacts.

For example, whereas the Executive Summary states that the impact of Alternative 4 on bromide concentrations is less than significant and no mitigation is proposed, the actual impact analysis in the RDEIR/SDEIS states that the impact is significant, identifies revised Mitigation Measure WQ-5 for that impact, and concludes that the impact is significant and unavoidable even with the mitigation. *Compare* RDEIR/SDEIS, Executive Summary at p. ES-43 (Impact WQ-5) *with* RDEIR/SDEIS, Appendix A, Revised Chapter 8 at pp. 8-217 to 8-219. Similarly, the Executive Summary states that Alternative 4's chloride impacts are less than significant and that no mitigation is proposed, whereas the actual impact analysis in the RDEIR/SDEIS finds a significant impact, identifies revised mitigation measures WQ-7a through WQ-7d, and concludes that the impact is significant and unavoidable even with the mitigation. *Compare* RDEIR/SDEIS, Executive Summary at p. ES-43 (Impact WQ-7) *with* RDEIR/SDEIS, Appendix A, Revised Chapter 8 at pp. 8-226 to 8-230. For electrical conductivity, the Executive Summary correctly reports the determination in the RDEIR/SDEIS that the impacts of Alternatives 2D, 4, 4A and 5A all would be significant, but fails to report that the mitigation identified for Alternative 4 differs from the mitigation identified for the new alternatives. *See* RDEIR/SDEIS, Executive Summary at p. ES-44 (Impact WQ-11, erroneously summarizing mitigation for EC impacts); Section 4.3.4 at pp.

4.3.4-30 to 4.3.4-31 (EC mitigation for Alternative 4A); and Appendix A, Revised Chapter 8 at pp. 8-244 to 8-246 (EC mitigation for Alternative 4). And whereas the Executive Summary reports that the significant EC impacts of Alternatives 2D, 4, 4A and 5A all would be mitigated to a less than significant level, the actual impact analysis in the RDEIR/SDEIS states that the EC impact of Alternative 4 would be significant and unavoidable even with mitigation. RDEIR/SDEIS, Appendix A, Chapter 8 at p. 8-243.

Thus, for three acknowledged significant and unavoidable impacts to water quality near CCWD intakes, the mandatory Executive Summary of the RDEIR/SDEIS contradicts the impact analysis that it is supposed to be summarizing. The RDEIR/SDEIS must be revised and recirculated with an Executive Summary that is accurate and does not disavow the significant impacts that are identified in the actual environmental impact analysis.

# 9. Conclusion

In light of these various flaws, the RDEIR/SDEIS fails to fulfill its basic function of promoting informed public decision-making and meaningful public participation. The analysis needs to be revised to conform to the requirements of CEQA and NEPA and it needs to be recirculated for another round of public review and comment.

# 10. Exhibits


Bogdan, K.M., 2015. "Schedule Information Related to California WaterFix." Email to Dana Heinrich and Diane Riddle at the State Water Resources Control Board. September 22, 2015. Accessed online on October 11, 2015 at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/docs/dwr_kenbogdan092215.pdf.

DWR, 2013. Modeling files from CALSIM II, DSM2, and SRWQM developed as the basis for the BDCP Draft EIR/EIS for the Existing Conditions with Fall X2, No Action Alternative with Fall X2, and Alternatives 1 through 9. Provided by Department of Water Resources to CCWD on an external hard drive on March 28, 2013.

DWR, 2015. Modeling files from CALSIM II and DSM2 developed to support sensitivity studies in the 2015 RDEIR/SDEIS Appendix A, Appendix B, and Appendix C. Provided by Department of Water Resources to CCWD on September 4, 2015.

Enright, C., 2008. "Suisun Marsh Salinity Control Gate: Purpose, Operation, and Hydrodynamics/Salinity Transport Effect" Presented at the annual meeting of the California Water Environmental Modeling Forum, Sacramento, California. February 28, 2008.

Reclamation, 2015. U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region, Central Valley Operation. Delta Cross Channel Operations. Accessed online July 1, 2015 at http://www.usbr.gov/mp/cvo/vungvari/Ccgates.pdf.

The Bay Institute, NRDC, Planning and Conservation League, Environmental Entrepreneurs, Defenders of Wildlife, Contra Costa Council, 2013c. "New Plan Offers an Effective, Affordable Package of California Water Supply and Bay-Delta Fisheries Solutions." Press Release. January 16, 2013.

The Bay Institute NRDC THE EARTH'S BEST DEFENSE PLANNING AND CONSERVATION LEAGUE E2 ENVIRONMENTAL ENTREPRENEURS* DEFENDERS OF WILDLIFE CONTRA COSTA COUNCIL

**FOR IMMEDIATE RELEASE**
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## New Plan Offers an Effective, Affordable Package of California Water Supply and Bay-Delta Fisheries Solutions

SAN FRANCISCO, CA (January 16, 2013) – Investing in a broad portfolio of Bay-Delta water solutions can save Californians billions of dollars in costs while increasing water supply and strengthening protections for the ailing delta ecosystem and its fisheries, according to a new proposal released today by business and conservation groups in advance of the draft Bay Delta Conservation Plan expected next month. The Bay-Delta is the largest estuary in the West and a critical source of water supply for more than 22 million Californians.

"This is the kind of fresh approach that is needed to protect the Bay-Delta environment, state taxpayers, and meet California's water needs," said **Congressman George Miller (D – Concord)**. "I know how powerful it can be when thoughtful environmentalists, business leaders and urban water agencies reach common ground on the water solutions that are so critical to our state's future."

The proposal, *A Portfolio-Based Conceptual Alternative for the Bay Delta Conservation Plan*, offers a more effective and affordable package of solutions to address the complex water challenges facing the delta today. The alternative plan proposes focusing on a smaller, less expensive new water conveyance tunnel in the delta, and investing the cost savings in water recycling and conservation to meet the long-term water needs of cities and farms. Additional savings could be used to shore up the delta's aging levees and to increase water storage south of the delta. Collectively, this package of solutions would cost billions of dollars less than the $18 billion price tag for the current draft Bay Delta Conservation Plan that is narrowly focused on a much larger set of twin tunnels and habitat restoration.

A group of conservation and business groups, including **The Bay Institute**, the **Contra Costa Council**, **Defenders of Wildlife**, **Environmental Entrepreneurs**, the **Planning and Conservation League** and the **Natural Resources Defense Council**, sent a letter urging U.S. Interior Secretary Ken Salazar, Secretary John Laird, Deputy Secretary Jerry Meral and Commissioner Michael Connor to consider seriously this alternative as they move forward to finalize the plan for the future of the delta. Separately, **San Diego Mayor Bob Filner** and a group of urban water agencies, including **Contra Costa Water District**, **East Bay Municipal Utility District**, **Alameda County Water District**, **San Francisco Public Utilities Commission**, **San Diego County Water Authority** and **Otay Water District** also sent a joint letter in support of careful analysis of this new proposal.

By reducing the size – and cost – of a delta facility and habitat restoration, the proposal shows that billions of dollars could be saved and invested in a range of proven, cost-effective regional water solutions, including:

- **Dramatically increasing local water recycling and conservation:** Boosts water supply overall and improves the reliability of water in dry years by investing in local solutions south of the delta.
- **Reinforcing delta levees:** Reduces vulnerability to earthquakes, sea level rise and climate change impacts.
- **Improving cooperation among water agencies:** Strengthens collaboration among water agencies to maximize the benefits of water recycling and groundwater management to provide new water supplies at lower costs.
- **Developing new water storage south of the delta:** Improves our ability to store water in wet years to meet needs in dry years when high delta pumping levels can be most harmful.

The many potential benefits of these investments include more water at a lower cost in comparison with the current draft BDCP plan, a healthier environment, thousands of new jobs in the communities that would pay the majority of costs, greater likelihood of permitting from regulators, greater potential to attract funding partners and reduce pressure for public funding, faster water supply benefits; more local control of water supply, and less reliance on imported water.

The plan recommends restoring 40,000 acres of delta habitat, driven by the best available science to protect native fish and wildlife, over the next 15-20 years. Although ambitious, this restoration program would be a reduction from what is proposed in the current draft BDCP plan, and focused on the near term, which is when habitat restoration needs to occur.

This conceptual alternative also relies on proposed water flow and pumping rules developed by state and federal fisheries agency scientists to protect the delta and its fisheries, based on the best science available today. In these and several other areas, however, additional analysis of costs and benefits is needed to optimize this new approach.

Up to now, the Bay Delta Conservation Plan has focused largely on advancing a massive twin tunnel conveyance facility along with a very large scale habitat restoration effort. This approach could be burdened with large uncertainties, including impacts on imperiled species, uncertainty about future water supplies, open-ended costs to water agencies and the public, as well as heightened political controversy.

**Following are statements from conservation and business groups in support of this conceptual alternative for the Bay Delta Conservation Plan:**

"It is essential we find long-lasting solutions for the Delta," said **Bob Whitley, co-chair Water Task Force at the Contra Costa Council**. "The solutions we put on the table must strengthen protections for the delta ecosystem and be financially viable so we can meet the water demands of all within our means."

"In the investment community, it is accepted wisdom that a diversified portfolio is a wise strategy to minimize risk and obtain an acceptable return," said **Barry Nelson, senior policy analyst with the Natural Resources Defense Council**. "The alternative plan set forth today uses a comprehensive approach to show how we can produce improved water supplies and a healthier Bay-Delta at a lower cost. This is the kind of integrated, science-based and economically sound approach that is needed to break the logjam in the delta debate and demonstrate that a healthy environment and a healthy economy go hand in hand."

"If this proves out, it will be an affordable end to decades of California water wars," said **Jonas Minton, water policy advisor at the Planning and Conservation League**.

"It is imperative that the BDCP succeed and deliver reliable water for California and reliable conservation for our declining Bay Delta fish and wildlife," said **Kim Delfino, California director at Defenders of Wildlife**. "We are asking the agencies to analyze this alternative because we believe that the information gained will be critical in picking a winning plan."

"It's impossible to solve the Delta's problems without looking outside the Delta to put in place the water management strategies that ensure California uses its finite water resources more wisely," said **Gary Bobker, program director at The Bay Institute**. "The beauty of this alternative is that for the first time it links what we do in the Delta to how we manage water throughout the state."

**For more information on the alternative plan released today, see the following links:**

- Complete alternative proposal: http://bit.ly/13E0xsi
- Letter from business and conservation groups: http://bit.ly/Ut0SKs
- Letter from San Diego Mayor Bob Filner and urban water agencies: http://bit.ly/W0JI8x

- Conceptual alternative portfolio approach illustration: http://bit.ly/W7kB0V
- Current BDCP approach illustration: http://bit.ly/X8nu0C
- NRDC Kate Poole's blog: http://bit.ly/XeNjwQ
- NRDC Barry Nelson's blog: http://bit.ly/SLmvbU

**Additional media contacts:**
Bob Whitley, Contra Costa Council, 925-963-6533
Gary Bobker, The Bay Institute, 415-272-6616
Kim Delfino, Defenders of Wildlife, 916-201-8277
Jonas Minton, Planning and Conservation League, 916-719-4049

# # #

# A Portfolio-Based BDCP Conceptual Alternative

The eight components described below represent a conceptual alternative, not a proposed BDCP project. The analysis of this alternative is intended to assist BDCP in developing the most cost-effective and environmentally beneficial final BDCP project that can be implemented and produce benefits rapidly. Variations on the approaches below should be analyzed as well, including a full range of conveyance capacities.

## Guiding Principles

**Science-Based Ecosystem Management**: Credible, proven science will determine ecosystem improvements and water management, using on-the-ground results as the central driver of decision-making.

**Water Supply Reliability**: The BDCP can contribute to improved water supply reliability by reducing the physical vulnerability of Delta water supplies and embracing a portfolio approach that recognizes that water suppliers and the public have a broad range of options both in and outside of the Delta to meet their water needs and improve reliability.

**A Strong Business Case**: A strong business case is central to the success and financial viability of the BDCP. Sound economic principles and cost-benefit analysis must inform water supply improvements so that water ratepayers understand that the benefits they will receive from the project are reasonably proportional to what they are being asked to pay.

**Water Quality**: Delta water quality will be strongly influenced by the final BDCP plan, with potential impacts and benefits to export water users, local municipalities, Delta residents, Delta farmers and the ecosystem.

## Conceptual Elements of a Diversified Portfolio Approach

**New Conveyance Facility**: Focus BDCP analysis on one 3,000 cfs North Delta intake facility and a single tunnel sized for 3,000 cfs gravity flow. This smaller facility would lower BDCP costs, improve reliability and reduce opposition. If implementation proves successful in meeting biological goals and objectives, a second phase could be constructed subsequently, but would not be permitted at this time.

**Project Operations**: Analyze, as a starting point for analysis of future SWP and CVP operations, the best science available today. In particular, analyze the operations proposal developed by state and federal biologists to conserve and manage a full range of covered Delta fish species, including consideration of the need to protect upstream fisheries resources.[1] Project operations should utilize a "big gulp, little sip" approach that increases exports in wet years – when water is available in excess of environmental needs

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[1] The work of state and federal agency biologists to produce a science-based operational scenario is summarized on pages 1-16 of this BDCP presentation - http://www.essexpartnership.com/wp-content/uploads/2012/11/BDCP_CS5_Update_NGO-Meeting_11_14_12v3.pdf

– and reduces diversions in average and drier years, particularly during key periods such as the spring and fall. Such an operations proposal has been developed over the past year by state and federal fish agency biologists. This is an important agency analysis that should be subjected to additional refinement in an open, transparent process, utilizing independent external peer reviewers. It is essential not to delay a detailed analysis of the likely yield of a new facility based on the best available science.

Estimated Water Exports: ~ 4 - 4.3 MAF/ year (2025). This is an initial estimate of average exports. BDCP has not yet modeled a 3,000 cfs facility with additional South of Delta storage and the agency-developed operational scenario included in this proposal.

**Reduced Reliance on the Delta through Investments in South of Delta Water Supplies:** DWR, many Urban Water Management Plans and other analyses have concluded that local water supply tools including conservation, water recycling, and other approaches, can provide reliable, sustainable and plentiful new sources of supply that will also be cost-effective over the long run. These sources can also be provided rapidly through additional investments. There is approximately as much new water available from these new water supply sources as is currently exported from the Delta.

This conceptual alternative proposes a smaller capital investment in a Delta facility, in comparison with the current BDCP preliminary project, and investment of savings in local water supply projects. For analytical purposes, this alternative includes a $2 billion investment in water recycling (at a capital cost of approximately $6,430 - 6,470 per AF of permanent water recycling capacity) and a $3 billion investment in urban conservation (at an initial/capital cost of $3,230-4,860 per AF).[2] Urban stormwater capture, groundwater cleanup, and conjunctive use should be included as cost-effective methods for generating future new sources of water, and would also be important elements of a large-scale effort to invest in new local water sources. Additional cost-effective savings can also be obtained from investments in agricultural conservation.[3]

Estimated Yield: 926,000 - 1,245,000 acre-feet of permanent water supply. (309,000 – 311,000 acre-feet from water recycling and 617,000 - 934,000 acre-feet from urban efficiency.)

**Improved Water Agency Integration:** The principles of integrated regional water management planning should form the foundation for improving cooperation and integration among Bay Area, Central Valley, and Southern California water agencies to provide improved water supply reliability and quality benefits. Increasing integration and

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[2] See attachment for additional detail regarding cost and yield estimates. Note that these are initial/capital costs, not annual per-acre-foot unit costs. A comprehensive BDCP analysis should also address operations and maintenance costs of a full range of alternative investments.
[3] The Department of Water Resources Bulletin 160-2009 http://www.waterplan.water.ca.gov/cwpu2009/index.cfm (Volume 2,Chapter 2, page 2-13) states that agricultural water conservation costs range from $35-$900 per AF. Because of the width of this cost range, agricultural conservation is not included in the conceptual cost and yield numbers above. A final BDCP portfolio proposal should, however, include agricultural water use efficiency investments.

cooperation among these agencies could produce substantial potential benefits and cost-savings. For example, more than a dozen significant water agencies serve the Bay Area. Improved physical connections and increased cooperation among these agencies could reduce risks related to earthquakes and localized drought conditions, facilitate wastewater recycling, and utilize existing infrastructure more efficiently.

In Southern California, additional benefits could be obtained, for example, by facilitating water management agreements and programs among agencies with the potential to construct water recycling facilities and agencies that have groundwater storage resources. The Metropolitan Water District could operate its system to facilitate innovative and cost-effective water management programs between agencies in Southern California and elsewhere in the state. Southern California groundwater agencies could allow water from Southern California surface storage facilities to be managed conjunctively with regional groundwater storage facilities. This could, in essence, create new surface storage capacity at the far lower cost associated with groundwater storage. This approach could help take advantage of the supplies available during "big gulp" opportunities in the Delta. Similar potential benefits may exist through increased integration and cooperation in the agricultural sector.

In all of these opportunities it is imperative that program costs be clearly identified and allocated to the water suppliers that benefit. In this way, each public water supplier is able to account to the public it serves that their water ratepayer dollars are being spent wisely, according to law and in a manner that provides clear benefits.

**New South of Delta Surface and/or Groundwater Storage**: Include up to 1 MAF[4] of new South of Delta storage, with funding allocated through competitive bidding to evaluate proposed surface, groundwater and conjunctive use projects. Investments should be focused on projects that can be completed quickly and that are most cost-effective. Additional South of Delta storage[5] can allow for greater water exports in wetter years. As discussed above, surface storage south of the Delta could be used conjunctively with groundwater facilities to store wet-year exports for future dry years. This increase in storage capacity must be accompanied by new Delta operations that ensure that the new storage will be operated to implement "big gulp, little sip" operations.

**Levee Improvements:** Improve existing levees and build setback levees as part of habitat restoration. A $1 billion additional investment could improve Delta levees to protect life, property, and important infrastructure, and also upgrade key levees including the eight western Delta islands to a higher standard with improved stability and resilience

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[4] This 1 MAF storage target is based on limited BDCP modeling and may be revised based on further analysis.

[5] As used in this proposal, South of Delta storage is defined as storage integrated into the existing SWP and CVP Delta export system, including surface and groundwater storage in the Bay Area, the west side of the San Joaquin Valley, Kern County and Southern California. It includes storage controlled by the CVP, the SWP, MWD, Kern County Water Agency and other regional and local agencies.

in the face of seismic risk. Upgrading these key levees would provide significant water reliability benefits and would be an appropriate use of exporter funds.

Regardless of the size of a Delta facility, maintaining and improving Delta levees is critical to ensuring the physical reliability of Delta exports. Even with new conveyance, the CVP and SWP will continue to rely on water exports from the South Delta, particularly in drier years. With a 9,000 cfs facility, exports from the South Delta would constitute approximately 50 percent of total exports. In critically dry years, BDCP currently anticipates that 75 percent of total exports would be diverted from the South Delta.[6] Therefore, the benefits of this proposed investment in levee improvements would be particularly significant in dry years. BDCP does not currently include a strategy to reduce the physical vulnerability of the portion of Delta exports that would continue to rely on the Delta levee system.

East Bay Municipal Utility District, Contra Costa Water District and Delta landowners currently contribute to the maintenance of the levees upon which they rely. An analogous investment by export agencies would produce significant reliability benefits. For example, with average exports of 4 MAF/y, a contribution of $8/AF would produce $480 million to help improve Delta levees over the coming 15 years. Public funds for levee improvements are appropriate to protect Delta residents and infrastructure of regional and state importance (e.g. highways). Additional local contributions may be required.

**Delta Floodplain and Tidal Marsh Habitat Restoration:** Implement a large scale, approximately 40,000 acre habitat restoration program to benefit Delta fish and wildlife species, to provide a broad range of ecosystem functions and to be integrated with Delta flood management improvements. There is strong scientific evidence that floodplain habitat restoration, combined with adequate flows, can benefit salmon and other species. However, agency "red flag" memos and the National Research Council review of the existing biological opinions concluded that floodplain restoration cannot substitute for required ecosystem flows. Restoration of tidal marsh habitat, also a desirable activity, nonetheless, has far greater uncertainty associated with it, regarding benefits for many covered species, in comparison with the likely benefits of floodplain restoration. Tidal marsh restoration should be included in the BDCP plan as a complement to flow augmentation and floodplain restoration, as it is more likely to benefit some covered fish species in combination with these elements. Habitat restoration, particularly tidal marsh restoration, should in any case be implemented within an adaptive management framework. Existing CVP and SWP mitigation responsibilities, as well as new mitigation responsibilities associated with a new Delta facility, will be paid for by water exporters, while public funding should be focused on conservation benefits that go beyond

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[6] BDCP Draft Effects Analysis, April 13,2012. Tables C.A-24 and C.A-27 from Appendix 5.C - Attachment C-A, which can be found on p. C.A. 83 and C.A. 92 at this link: http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/BDCP_Effects_Analysis_-_Appendix_5_C_Attachment_C_A_-_CALSIM_and_DSM2_Results_4-13-12.sflb.ashx

mitigation. This proposal is focused on the coming 15-20 years. Long-term restoration efforts are likely to require additional funding.

**Integrating Science into Delta Management**: Increase the integration of the best available science into all aspects of Delta and related resource management. The Delta is a complex and highly dynamic system. During the past decade, an expanded investment in science has improved our understanding of this ecosystem. With ongoing investments, that understanding will continue to improve. A long-term investment in science and a program to integrate new scientific results into ongoing management are essential to long-term success. Therefore, BDCP should include the following:

- External independent scientific review at critical points, with clear mechanisms to incorporate peer review results.
- Quantified performance objectives, such as SMART[7] biological objectives and criteria for ecosystem restoration and water operations.
- Governance and adaptive management processes designed to ensure that goals and objectives are achieved, to obtain the best available science over time, and to ensure that scientific results are fully integrated into on-the-ground management.
- Carefully designed roles for the state and federal projects, as well as other stakeholders, to ensure a reliance on objective science.

This science-based approach is not anticipated to result in large increases in project costs. In fact, this approach would increase the cost-effectiveness of BDCP efforts, and should result in savings.

## Affording, and Paying for the Portfolio-Based Conceptual Alternative

Our organizations strongly support an analytically-based beneficiary pays approach to BDCP financing. We believe that the analysis of this portfolio approach will assist BDCP in developing detailed cost allocations and in attracting additional funding partners. It will also help reduce pressure for public funds and ensure that such funds are spent effectively and appropriately.

Preliminary cost estimates indicate that this conceptual alternative is less expensive than the current preliminary preferred BDCP project. In addition, some of the investments in this portfolio alternative, such as levee and local water supply investments, are likely to be necessary even with a large Delta facility. Therefore, the actual cost difference between these two different approaches may be larger than indicated here.

This conceptual alternative is more financially viable than the preliminary preferred 9,000 cfs Delta facility project. That project, pegged at $14 billion or more, is proposed to be paid for by water exporters. Proposed habitat restoration could cost up to an

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[7] SMART objectives are those that are specific, measurable, achievable, relevant to the goal and timebound.

additional $4 billion, raising the total capital cost of the current approach to approximately $18 billion. By reducing the size of the project to a 3,000 cfs, single-bore facility, many billions of dollars can be freed up to invest in more local supply development and the water exporter shares of the other conceptual alternative components.

The water code requires water users to pay for a new Delta facility.[8] The public share of this conceptual alternative could be funded in part by a reduced water bond. The increased benefits and reduced cost of this approach can assist BDCP in attracting increased funding from beneficiaries, reducing the pressure on the water bond. We believe that the diversified portfolio approach in this conceptual alternative could assist in the effort to develop a broadly supported and effective new water bond.

**Estimated Cost Summary**

| **Conceptual Portfolio Component** | **Estimated Cost** | **Source of Funding** |
|---|---|---|
| New 3,000 cfs North Delta Facility | ~ $5-$7 billion[9] | Export water agencies |
| Local Supply Development | $5 billion | Local water agencies and cost share per state Integrated Regional Water Management Program (IRWMP) |
| Improved Water Agency Integration | TBD (may be funded through local supply funds described above) | Water agencies and cost share per state IRWMP |
| New South of Delta Surface and/or Groundwater Storage | ~$1.2 billion[10] | Exporters or local water agencies, and public cost share per IRWMP |
| Levee Improvements | $1 billion | Public, water exporters and other beneficiaries and Delta community |
| Delta Floodplain and Tidal Marsh Habitat Restoration | $1.7 billion | Export agencies and public |
| Integrating Science into Delta Management | TBD | Public and water agencies |
| **Total Conceptual Alternative Cost** | ~$14 to $16 billion | |

[8] California Water Code Section 85089.
[9] A BDCP July 1, 2010 presentation estimated the capital cost of a 3,000 cfs facility with 2 18-foot diameter tunnels at $7.2 billion. Using a single tunnel would reduce costs significantly.
[10] See attachment for details regarding cost estimates.

**Total Conceptual Alternative Water Supply Benefits**

~ 4.9-5.5 MAF/YR.

Delta exports: ~ 4-4.3 MAF/Y.

New South of Delta sources: ~ .93-1.2 MAF/Y

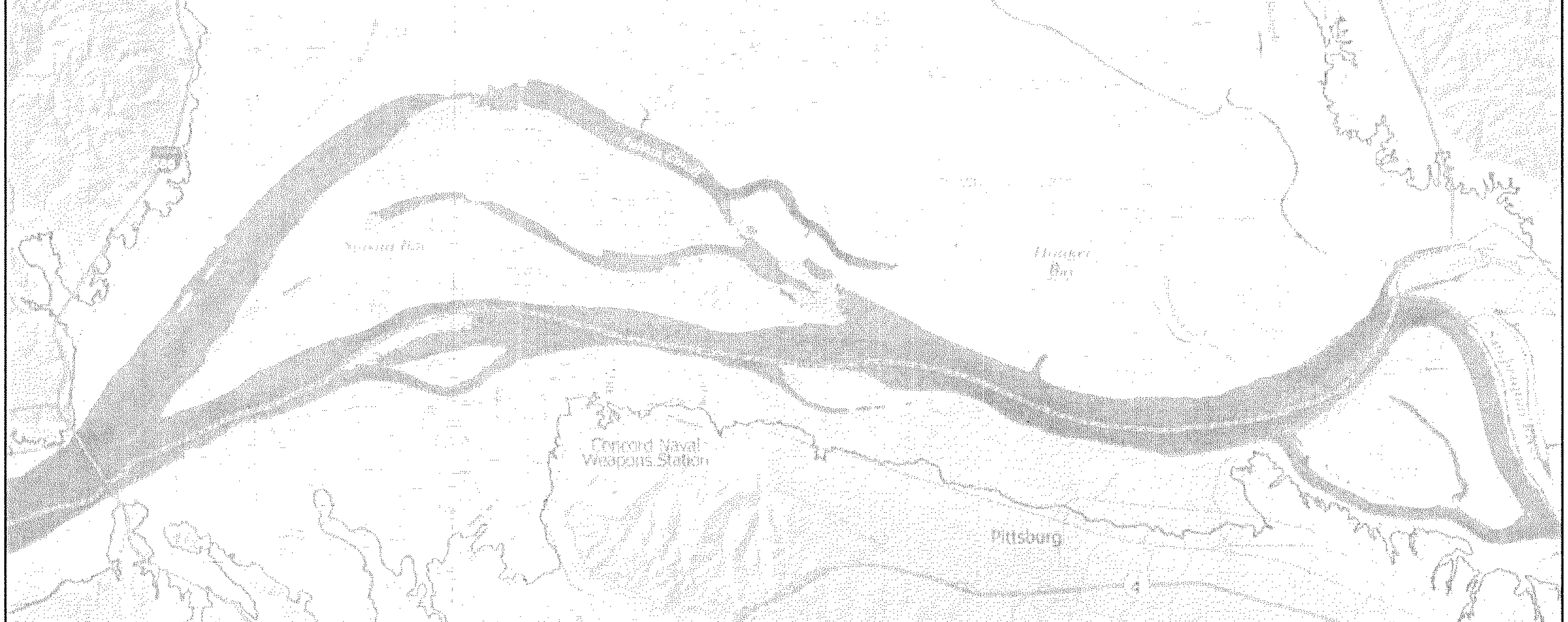
# Suisun Marsh Salinity Control Gate: Purpose, Operation, and Hydrodynamics/Salinity Transport Effect

CWEMF
February 28, 2008

Chris Enright
DWR

# Summary

- SMSCG purpose, components, operation
- Suisun Marsh/Bay hydrodynamics
- SMSCG effect on Marsh/Bay salinity & X2
- Frequency of SMSCG operation

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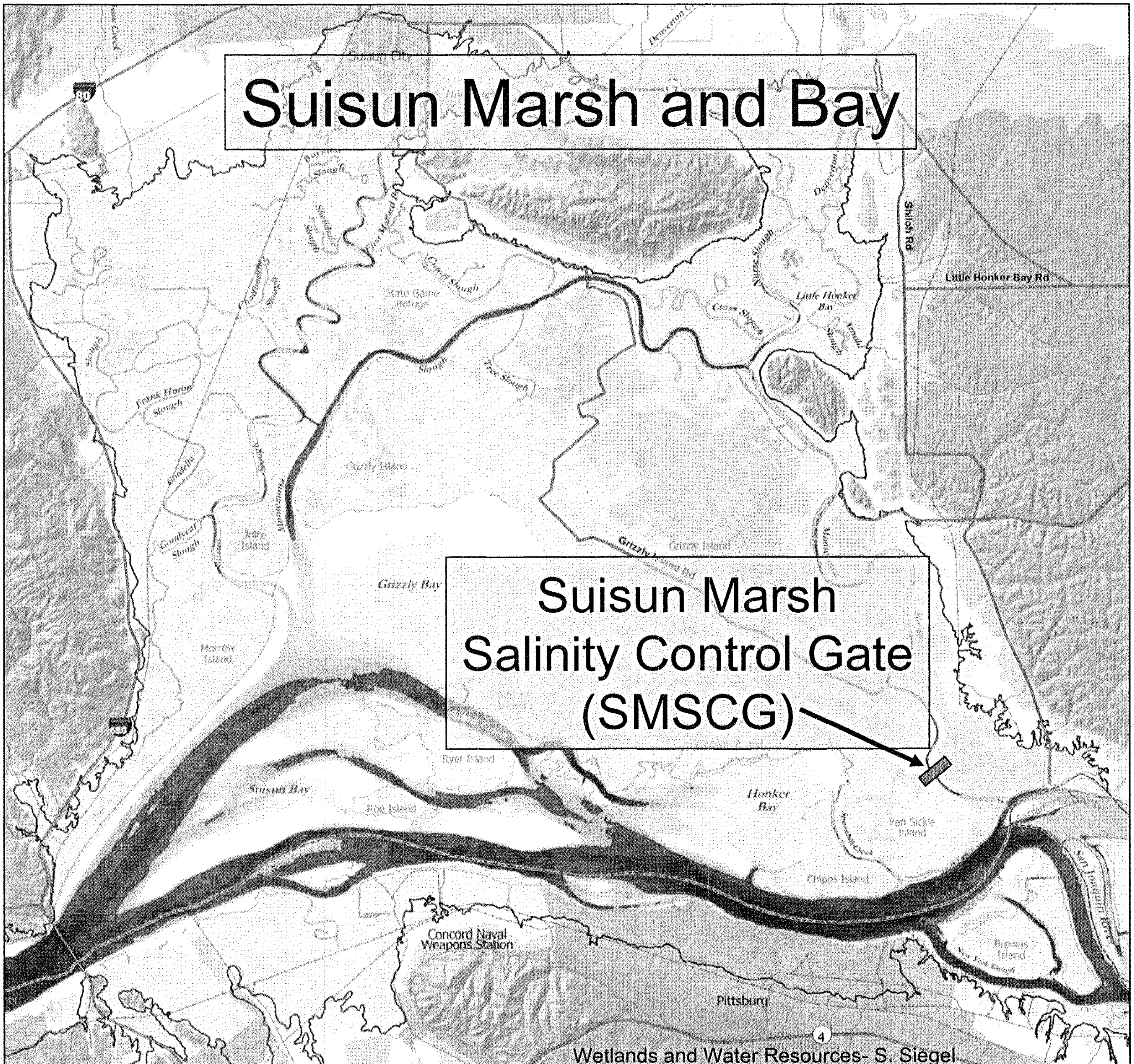

Suisun Marsh and Bay
Suisun Marsh
Salinity Control Gate
(SMSCG)
Shiloh Rd
Little Honker Bay Rd
Little Honker Bay
Arnold Slough
Cross Slough
Nurse Slough
Cutoff Slough
State Game Refuge
Tree Slough
Frank Horan Slough
Goodyear Slough
Joice Island
Grizzly Island
Grizzly Island Rd
Grizzly Bay
Morrow Island
Ryer Island
Roe Island
Suisun Bay
Honker Bay
Van Sickle Island
Chipps Island
Browns Island
New York Slough
San Joaquin River
Concord Naval Weapons Station
Pittsburg
80
680
4
Wetlands and Water Resources- S. Siegel

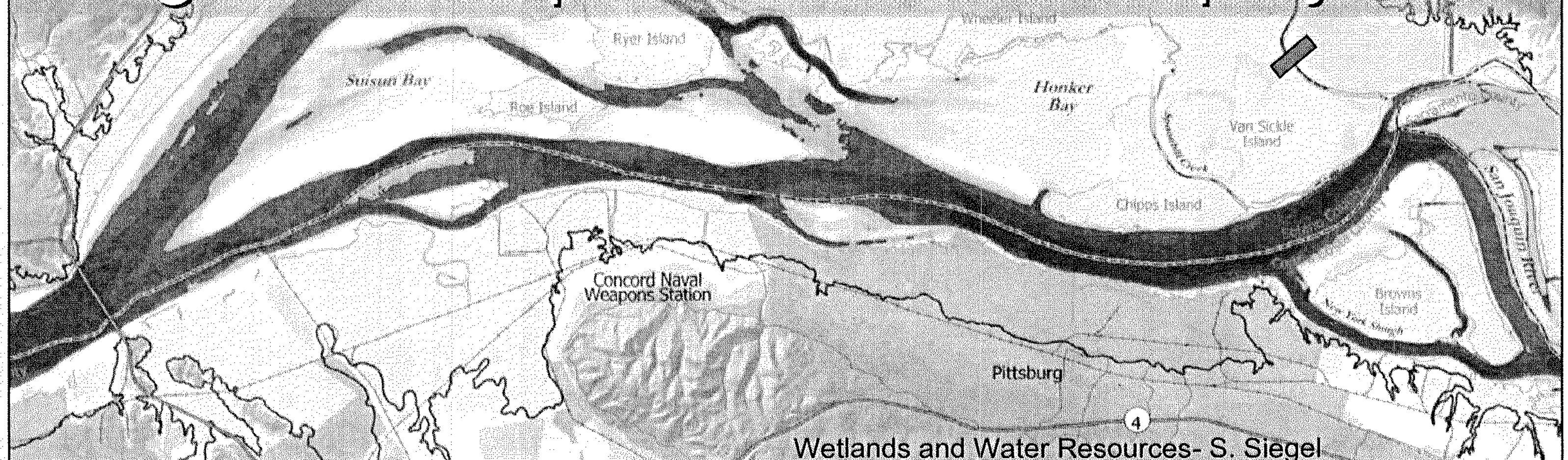
# SMSCG Purpose

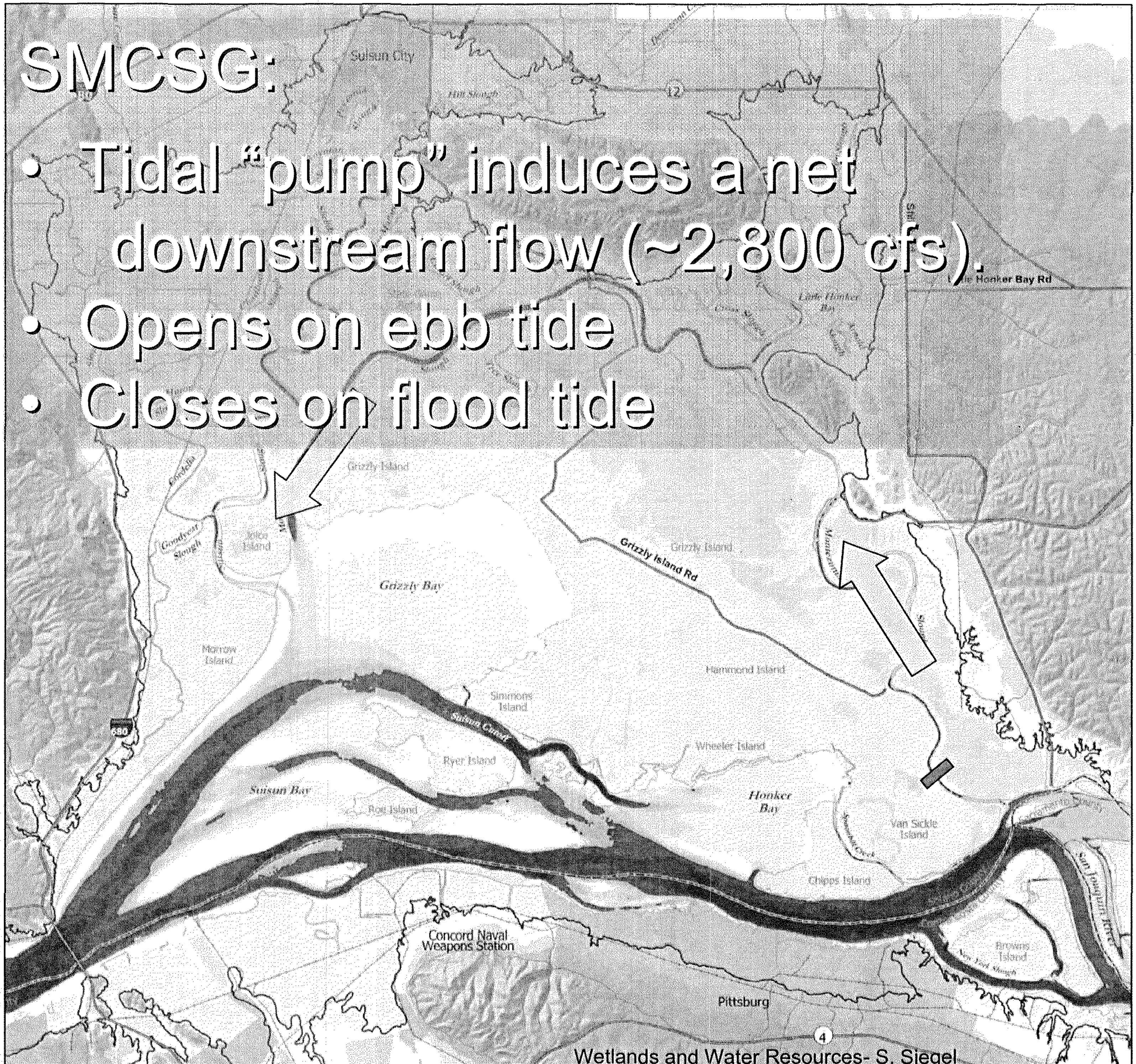
Guiding Conceptual Model:

- Reduced outflow increases salinity.
- Increased salinity reduces waterfowl food plant abundance and diversity.

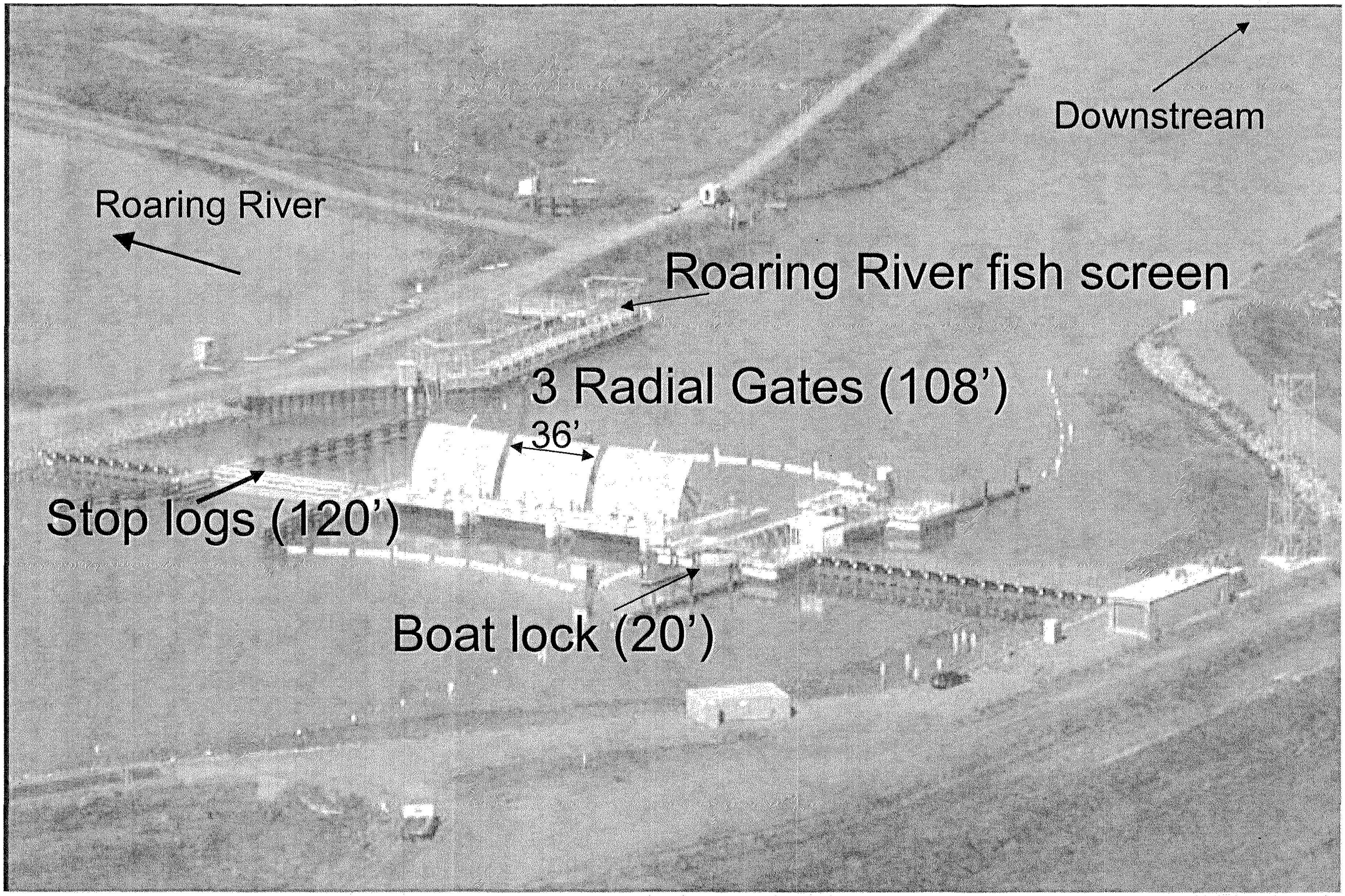
SMSCG Purpose:

- Reduce salinity in Suisun Marsh to help mitigate the impacts of the water projects

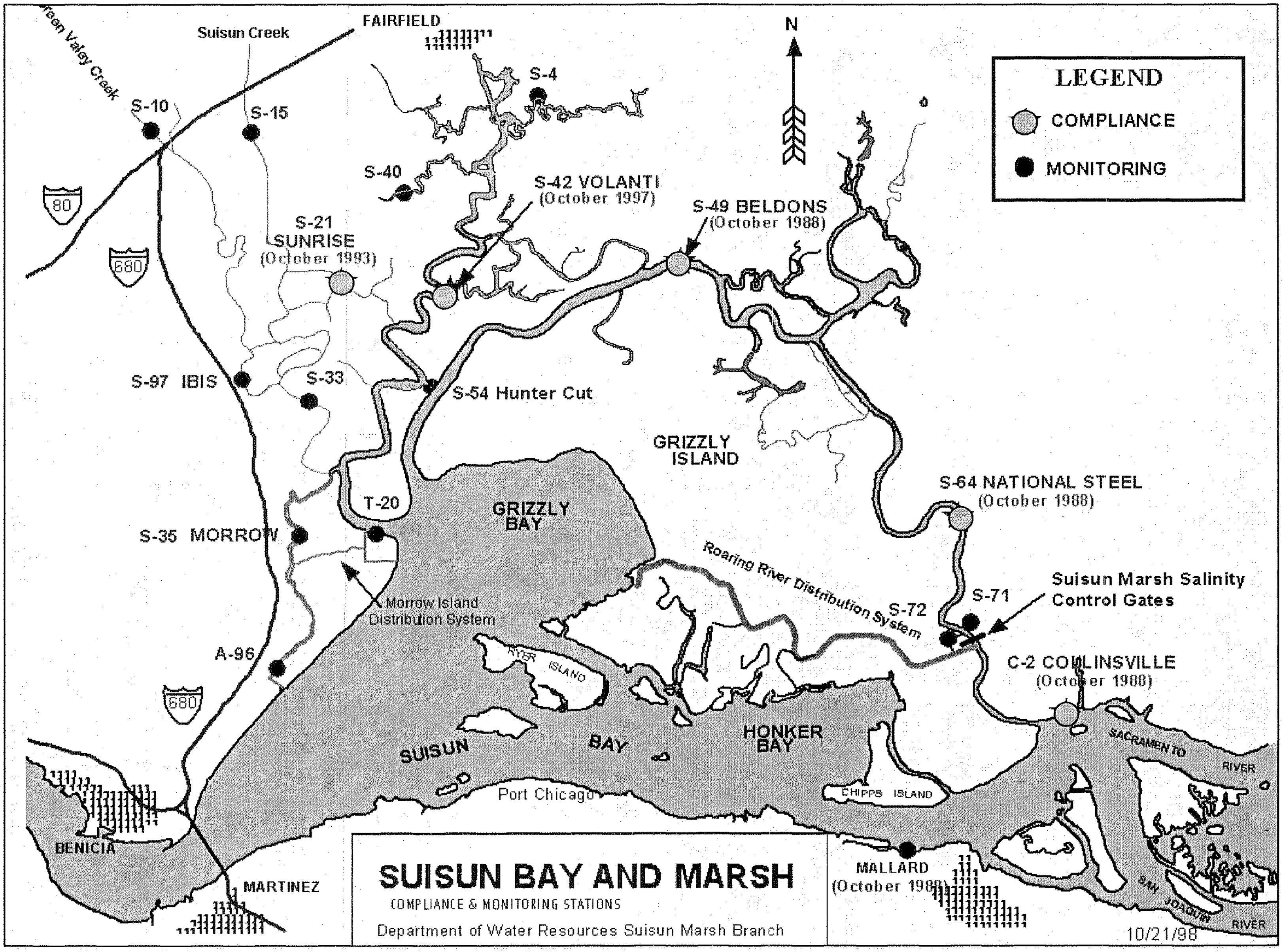



SMCSG:
• Tidal "pump" induces a net downstream flow (~2,800 cfs).
• Opens on ebb tide
• Closes on flood tide
Suisun City
Hill Slough
12
Little Honker Bay Rd
Little Honker Bay
Grizzly Island
Goodyear Slough
Joice Island
Grizzly Bay
Grizzly Island Rd
Morrow Island
Hammond Island
Simmons Island
Suisun Cutoff
Wheeler Island
Ryer Island
Suisun Bay
Roe Island
Honker Bay
Van Sickle Island
Chipps Island
Concord Naval Weapons Station
Browns Island
New York Slough
San Joaquin River
Pittsburg
680
4
Wetlands and Water Resources- S. Siegel

# SMSCG Components



# Salinity Standard Compliance Locations
# Both regulatory and contractual

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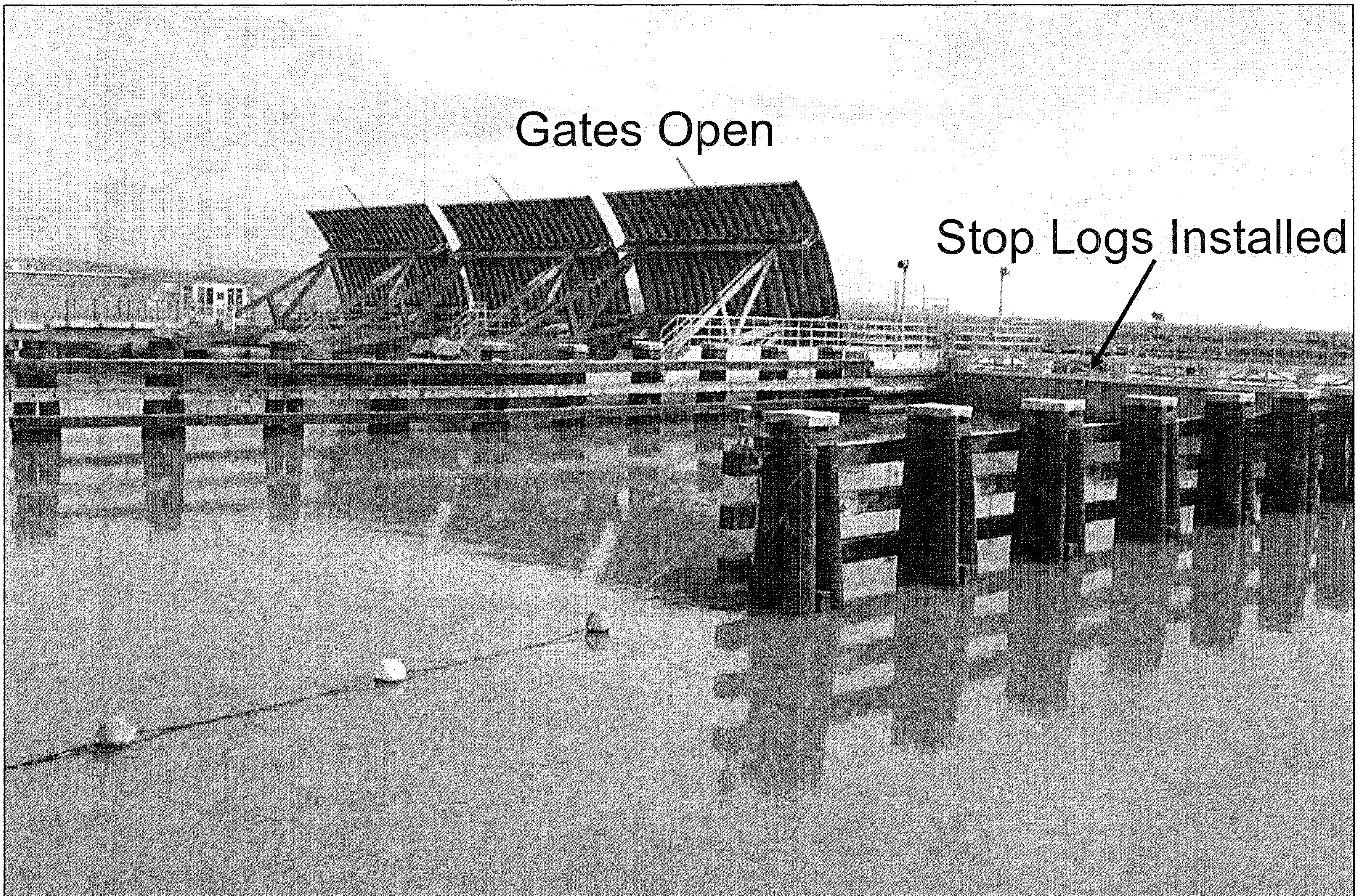
# Looking Upstream (southeast)

# Looking ~Upstream (east)

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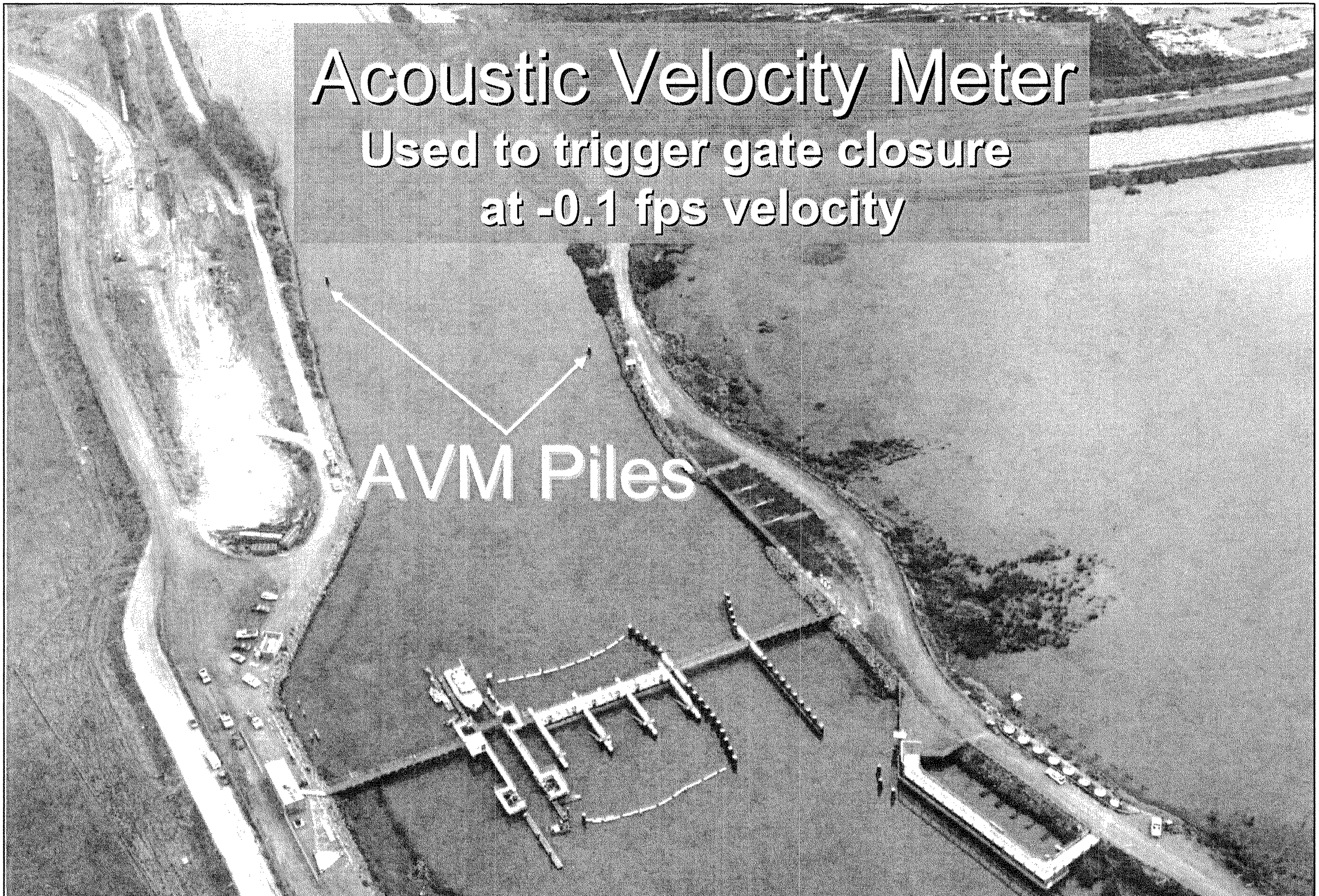
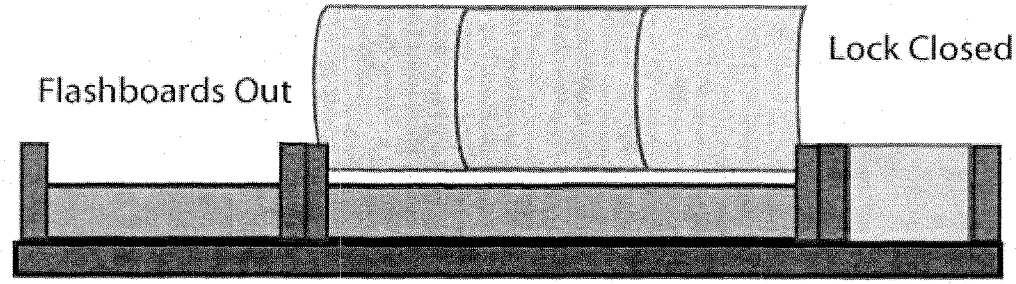

Acoustic Velocity Meter
Used to trigger gate closure
at -0.1 fps velocity
AVM Piles

# SMSCG Boat Lock (looking downstream - flood tide)

# SMSCG Boat Lock (looking upstream - flood tide)

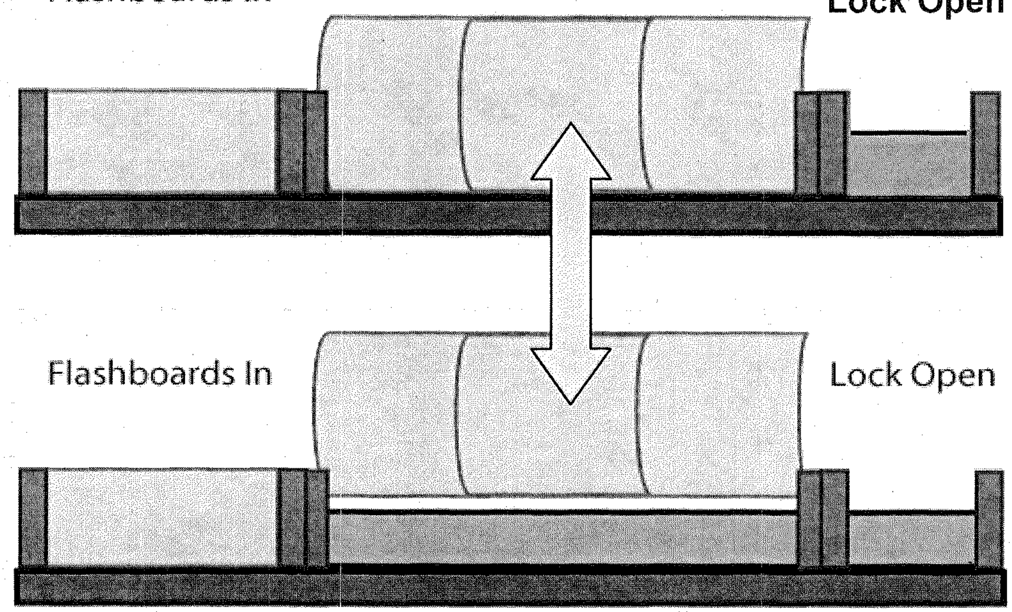
# Suisun Marsh Salinity Control Gate Configurations

June ⟹ September



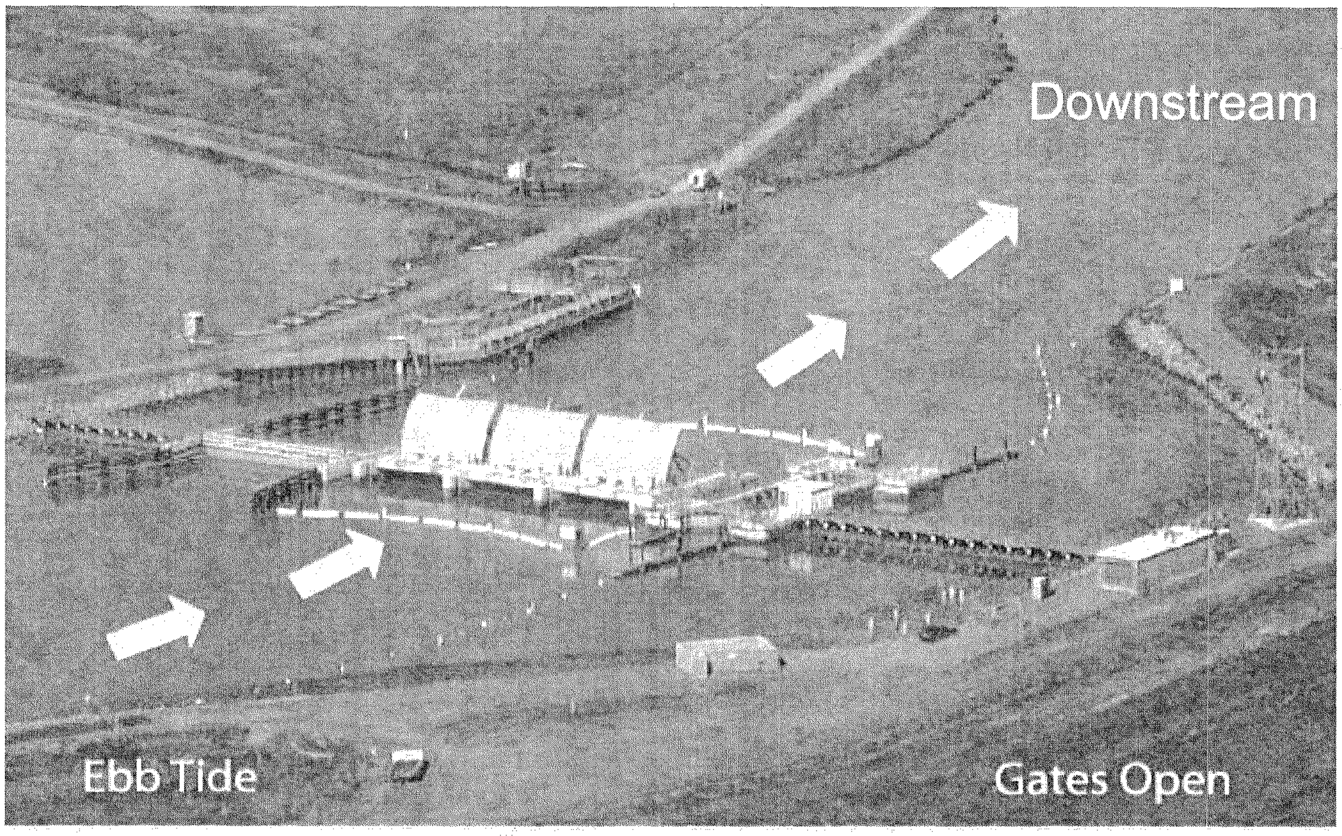

SMSCG Not Operating

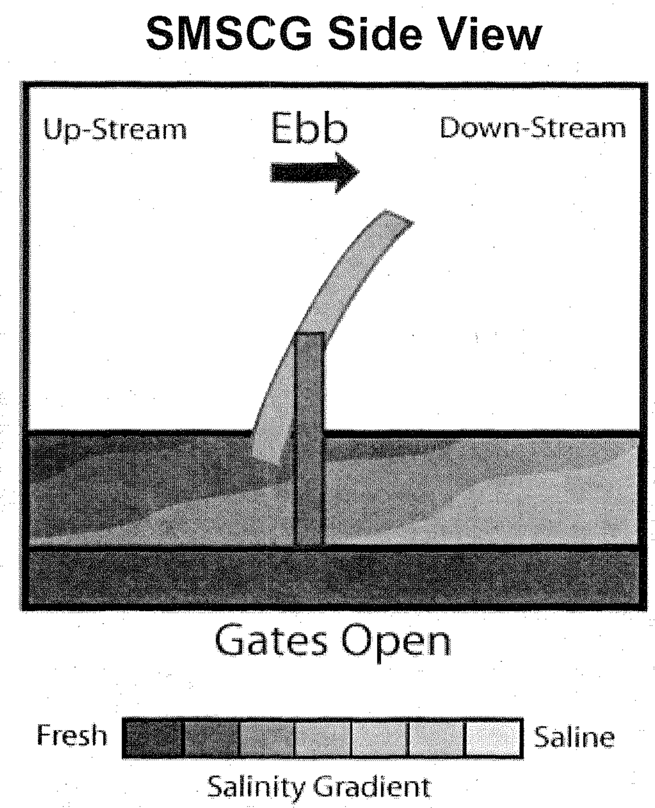
October ⟹ May
(when needed to meet standards)




SMSCG Operating

RECIRC2597




In operation:

- Closes on flood tide when current > -0.1 fps
- Open on ebb tide when upstream water level is 0.3 ft > downstream water level

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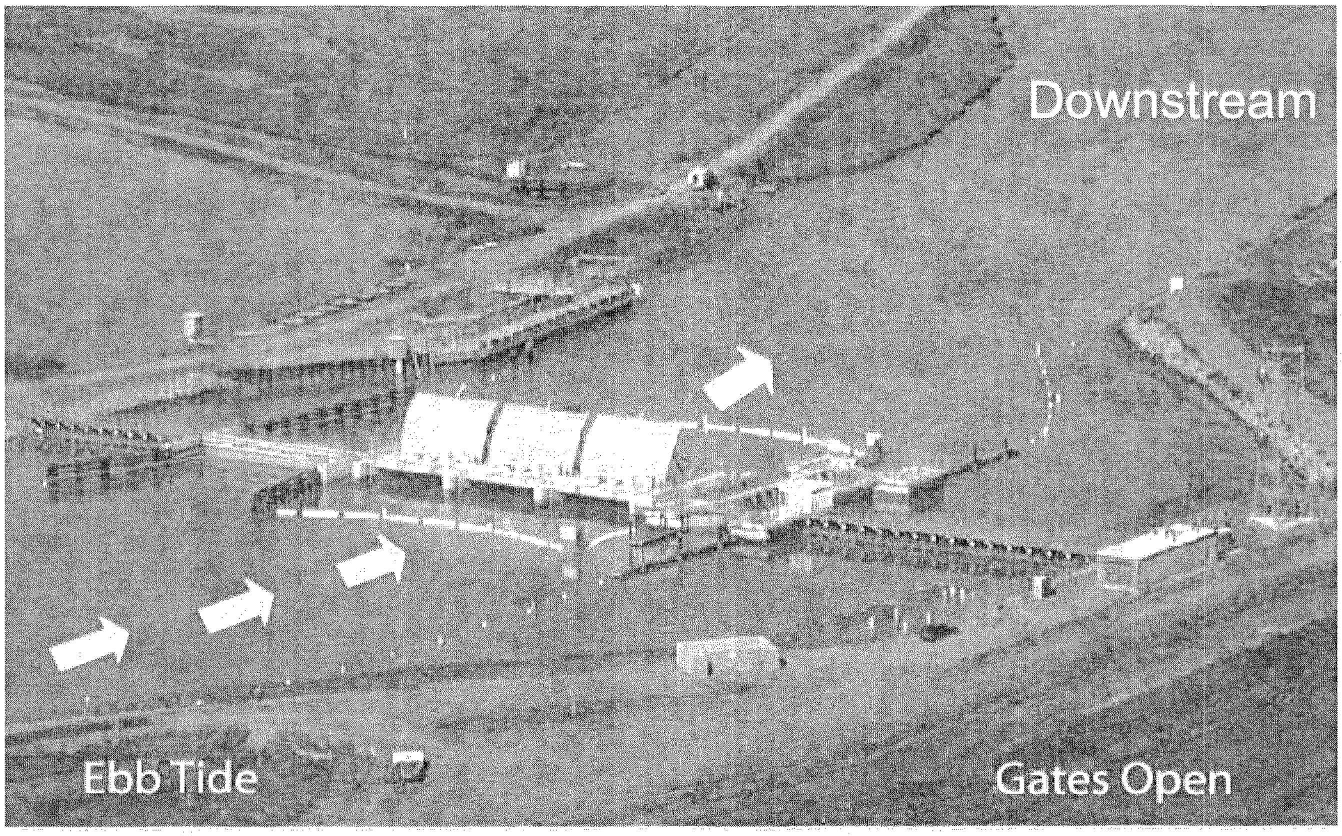
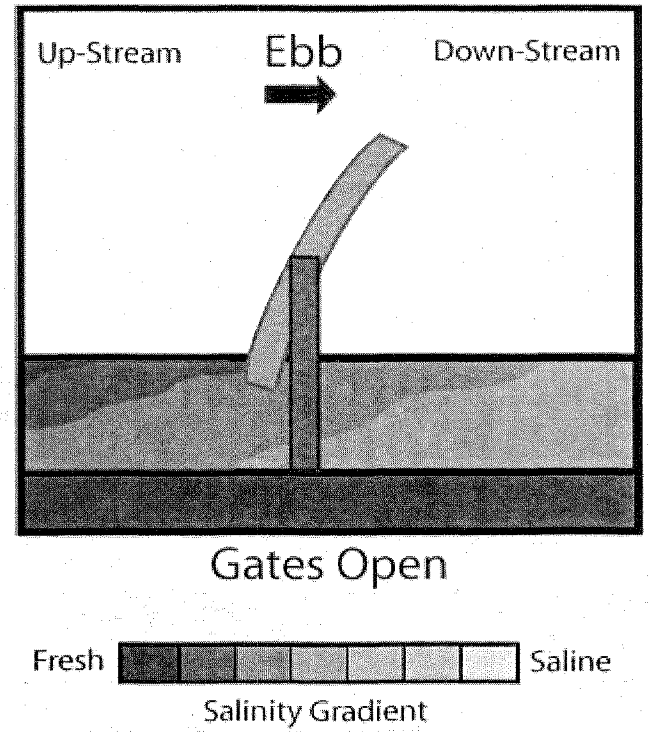



## SMSCG Side View

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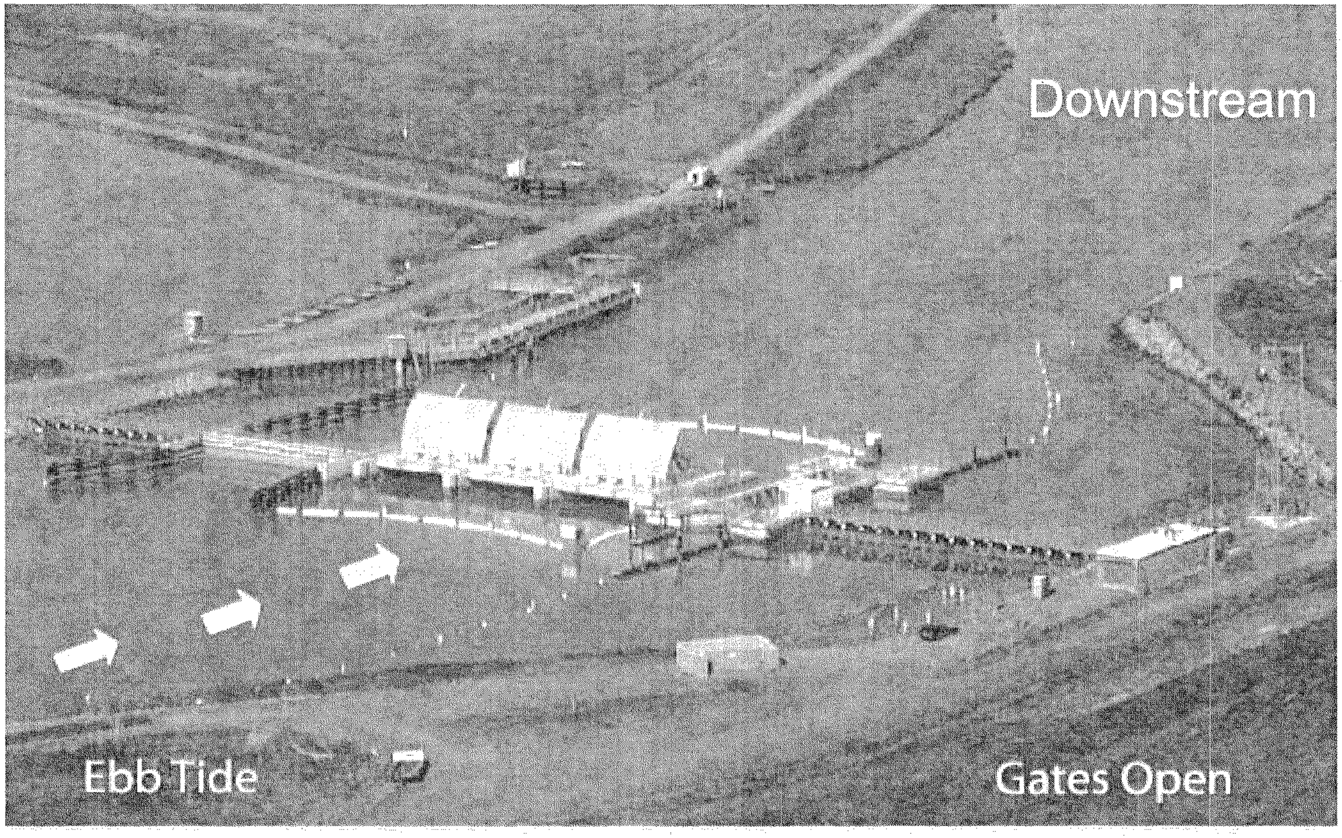
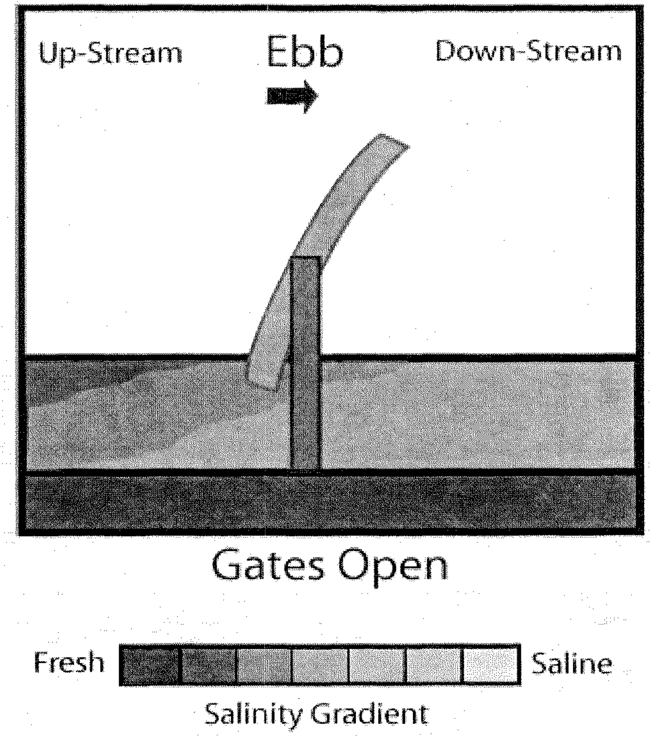



## SMSCG Side View

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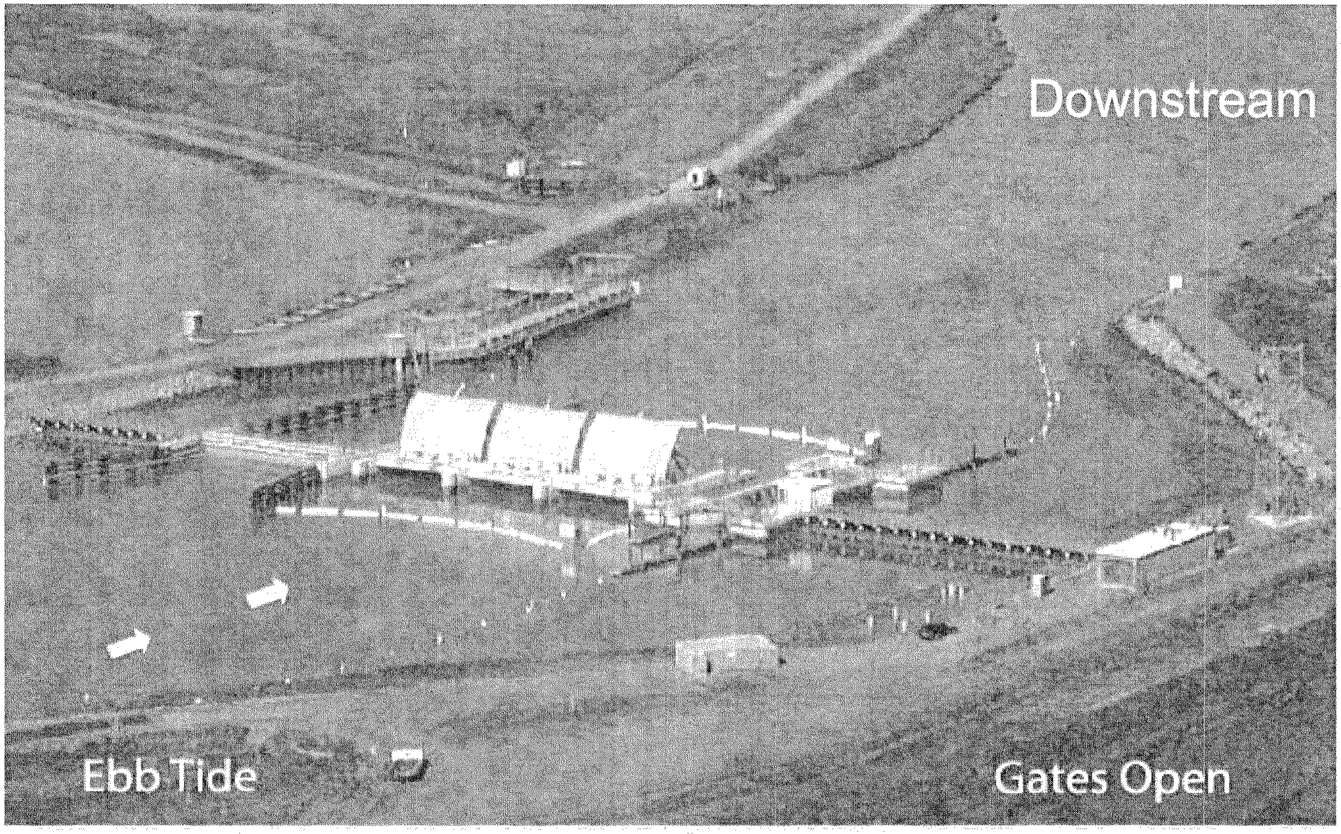
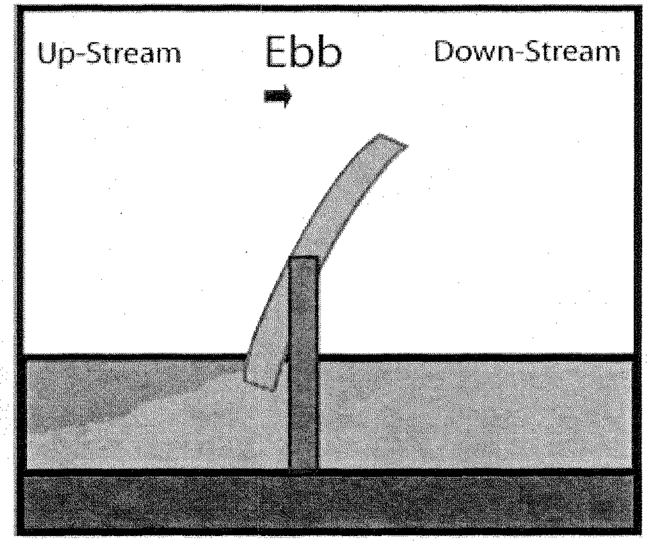
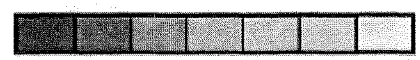


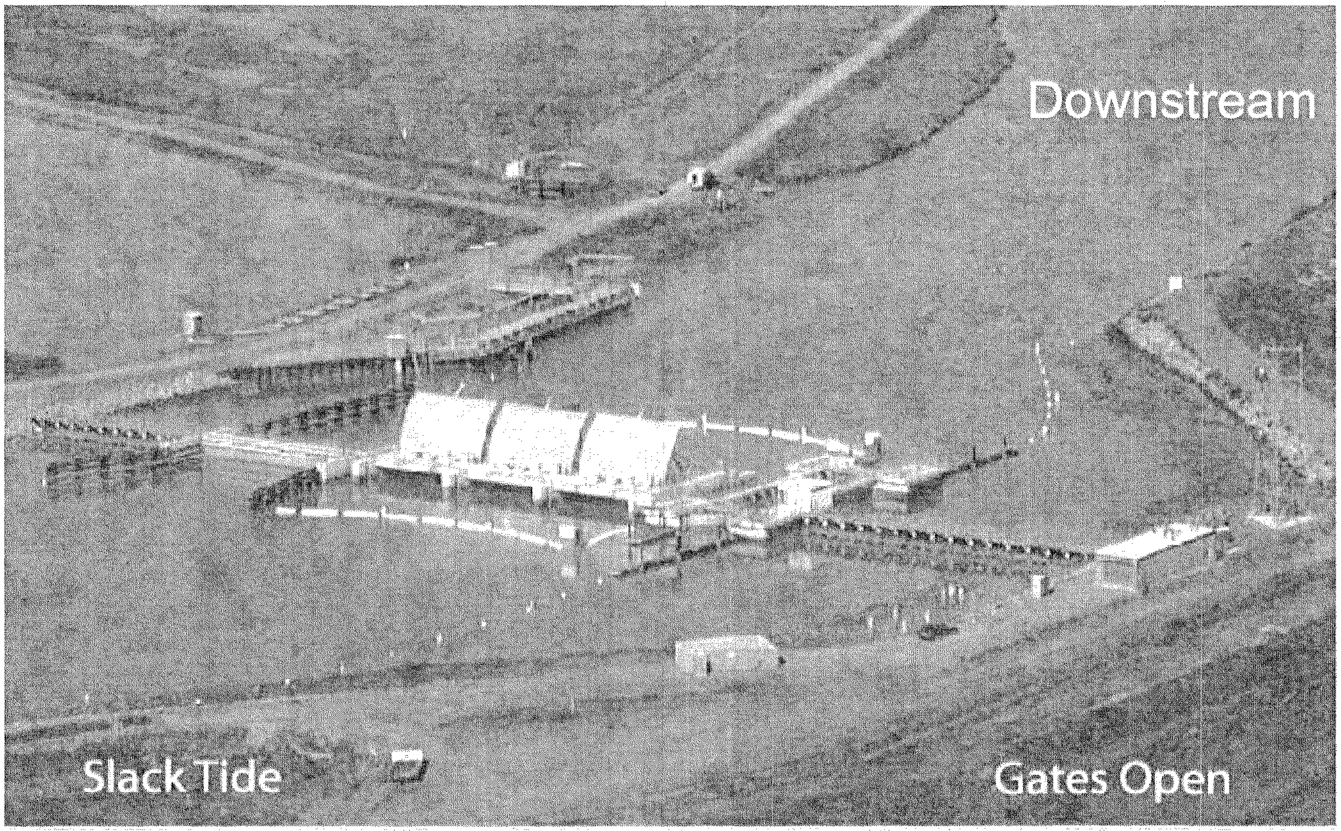

## SMSCG Side View



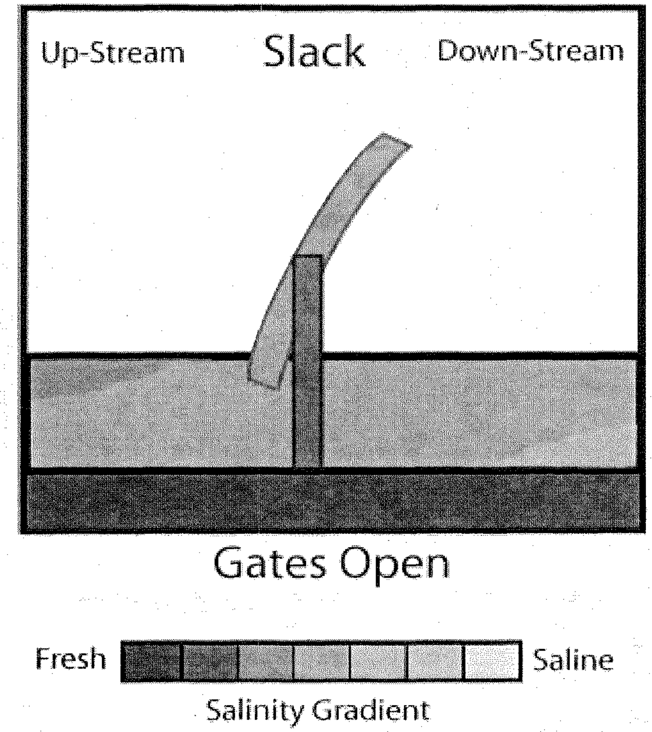

Gates Open

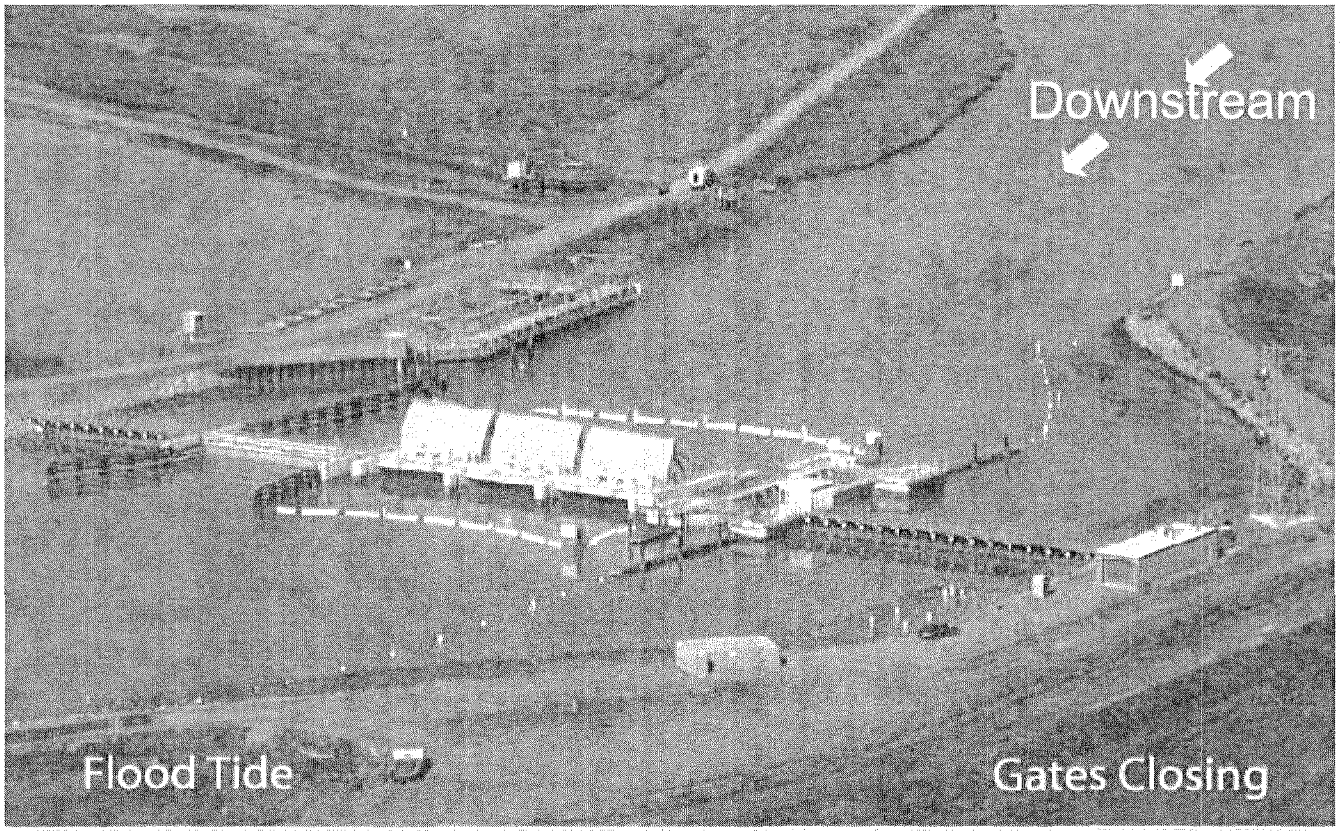
Fresh  Saline

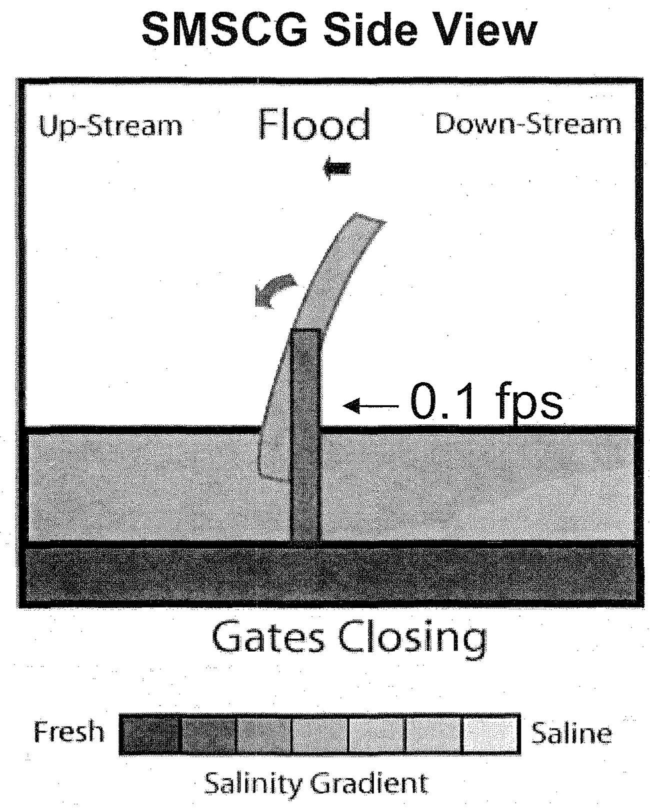
Salinity Gradient

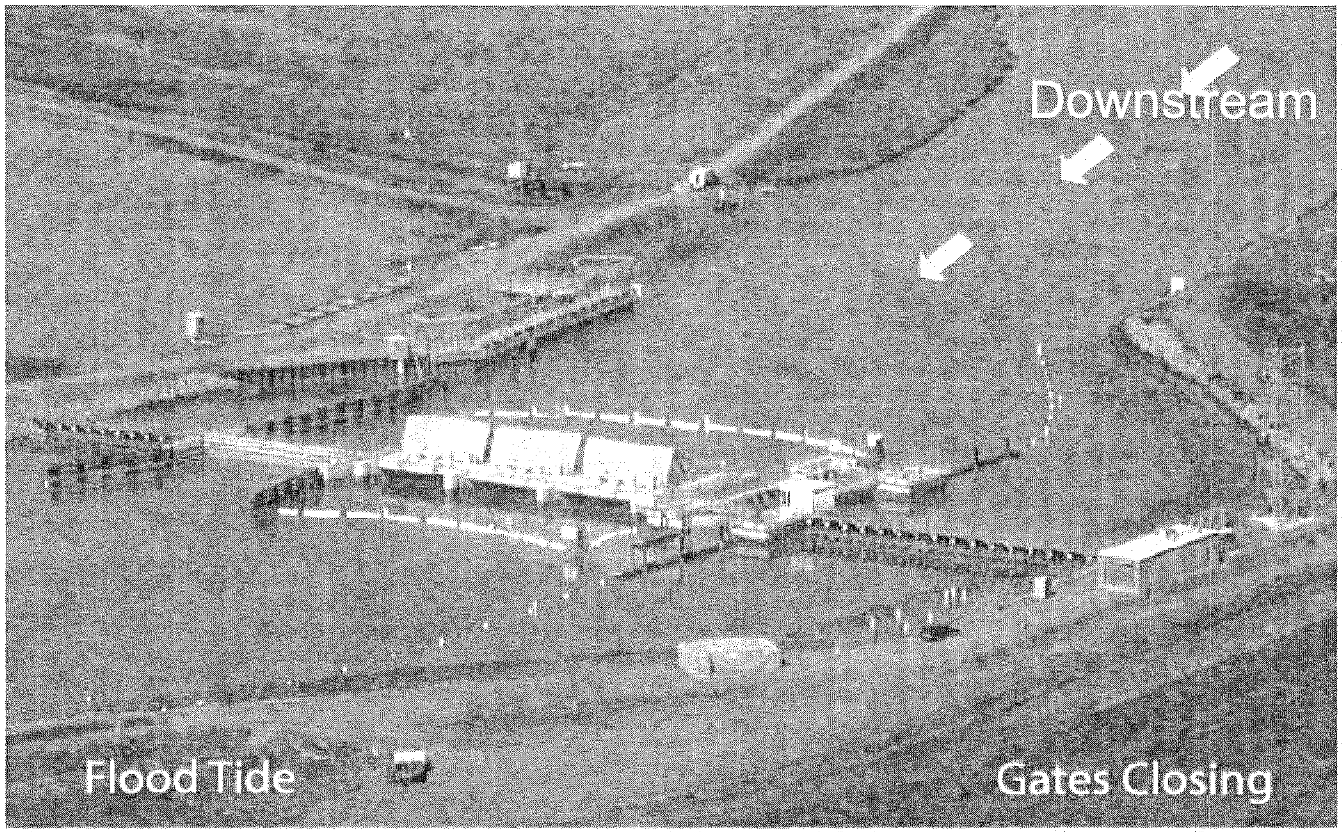



## SMSCG Side View

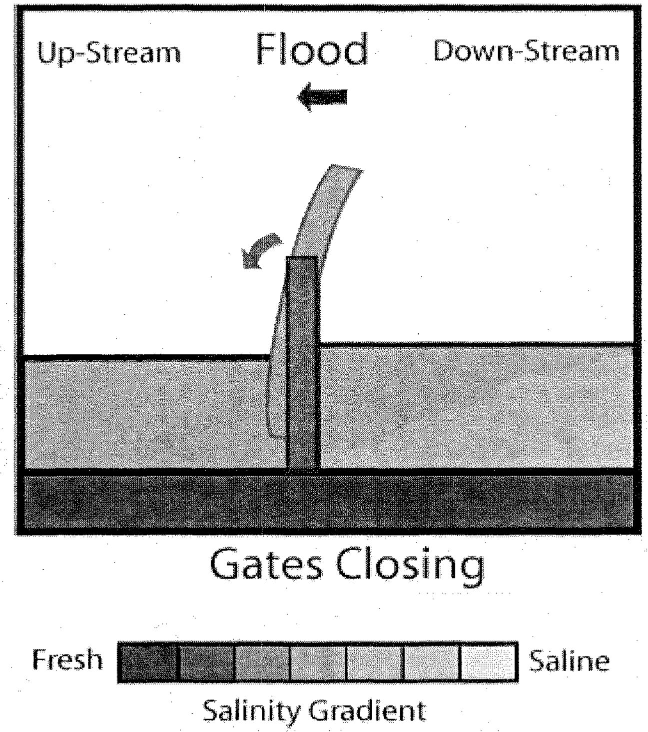



Downstream
Flood Tide
Gates Closing


SMSCG Side View
Up-Stream
Flood
Down-Stream
0.1 fps
Gates Closing
Fresh
Saline
Salinity Gradient




## SMSCG Side View

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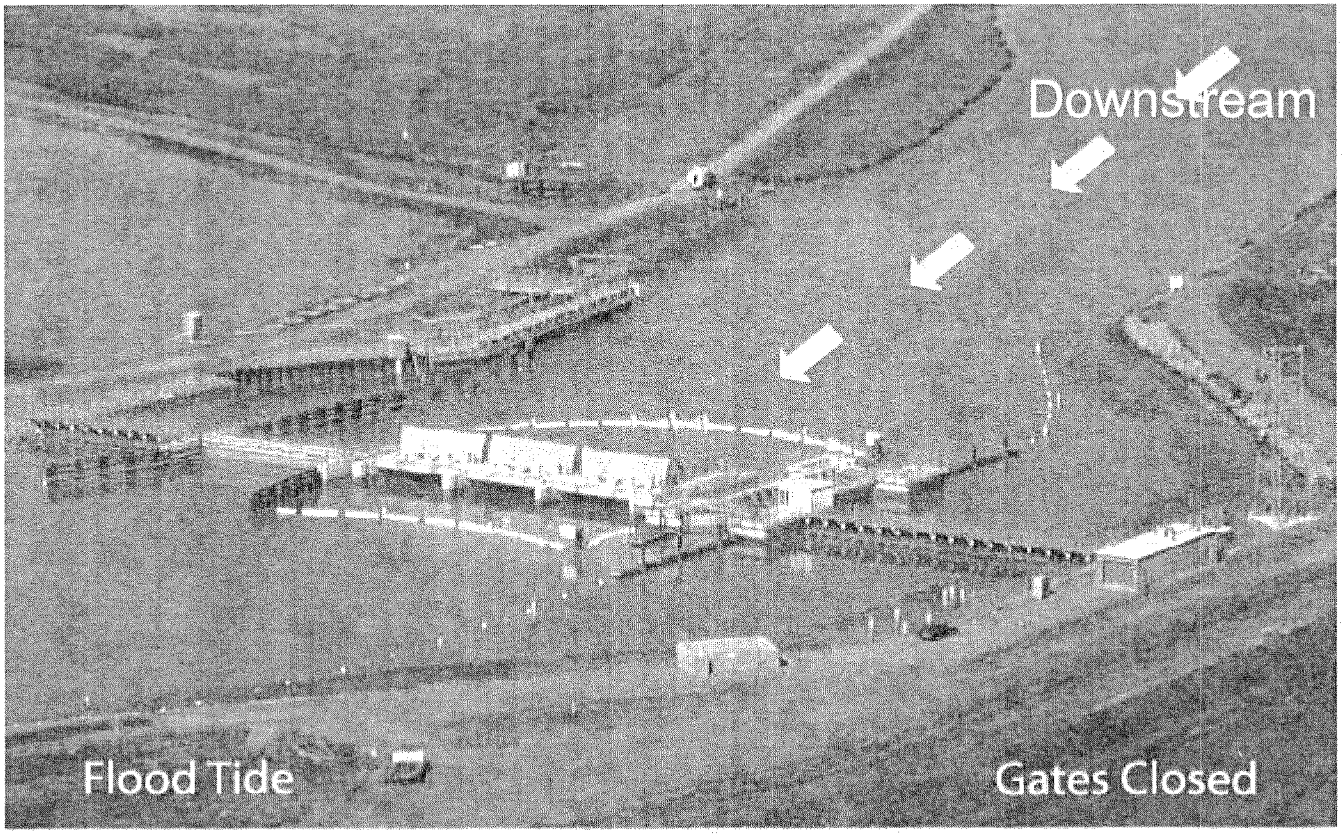
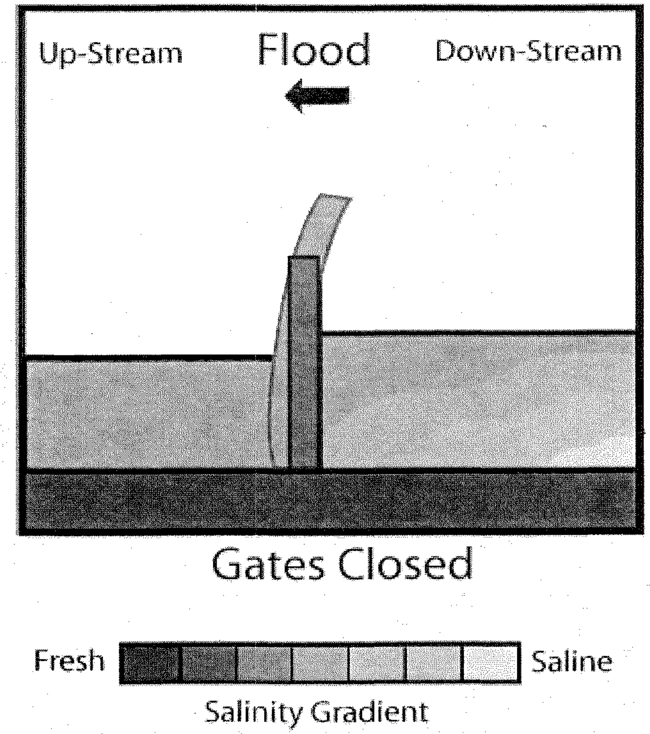
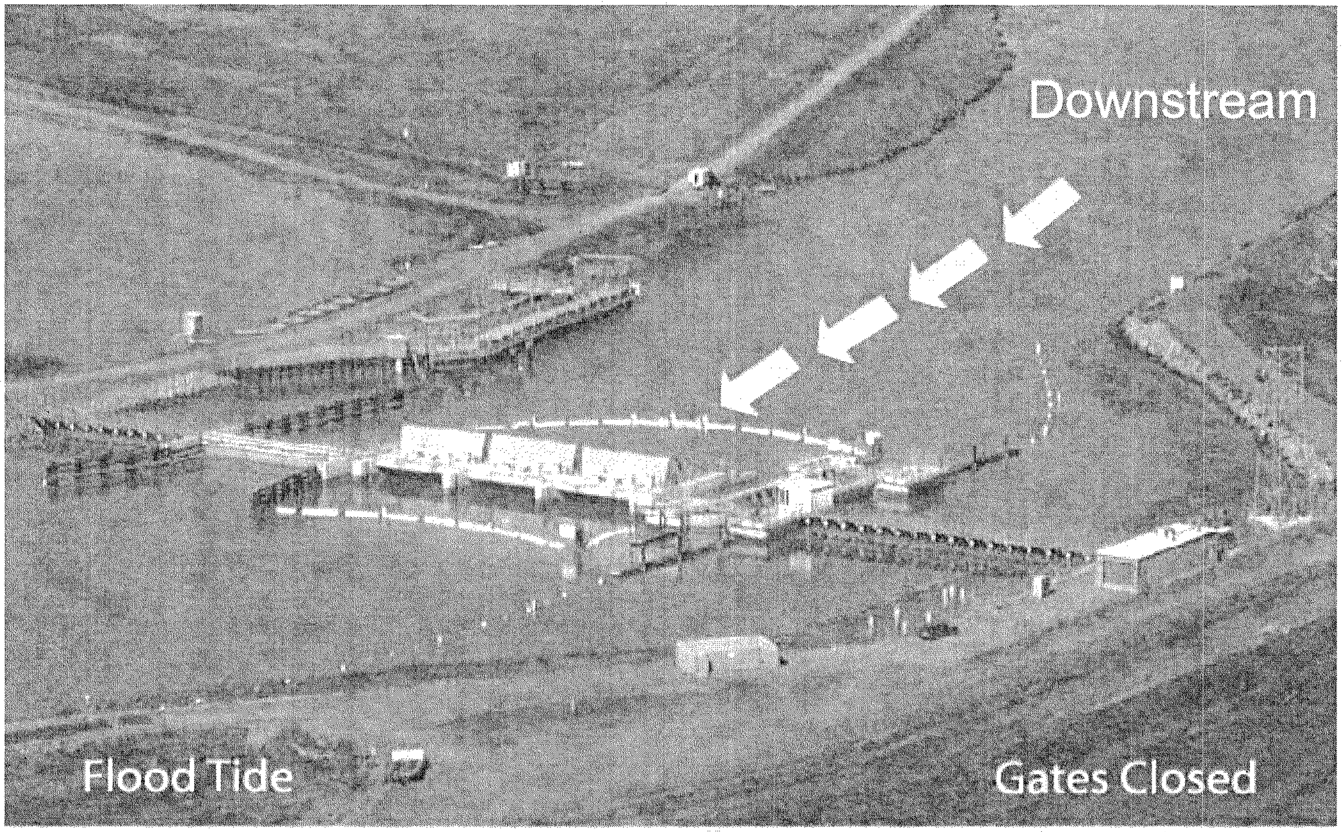


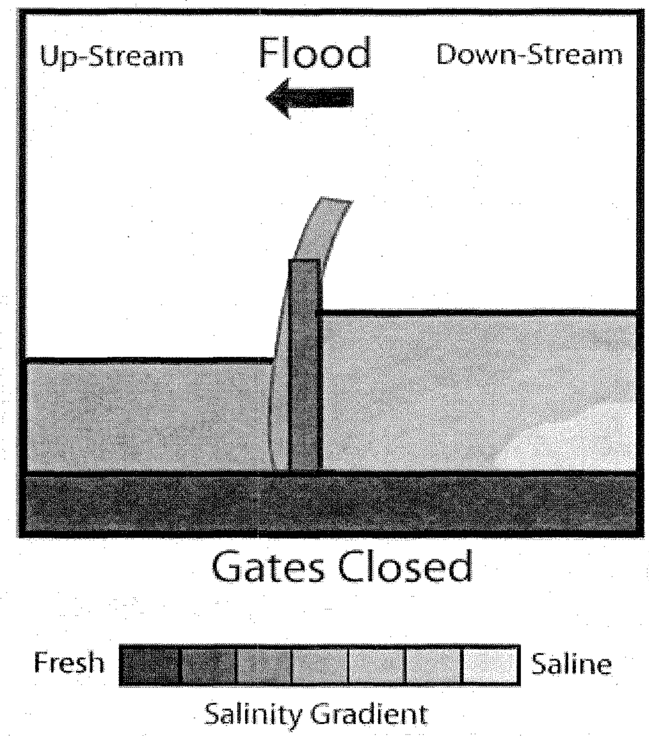

## SMSCG Side View

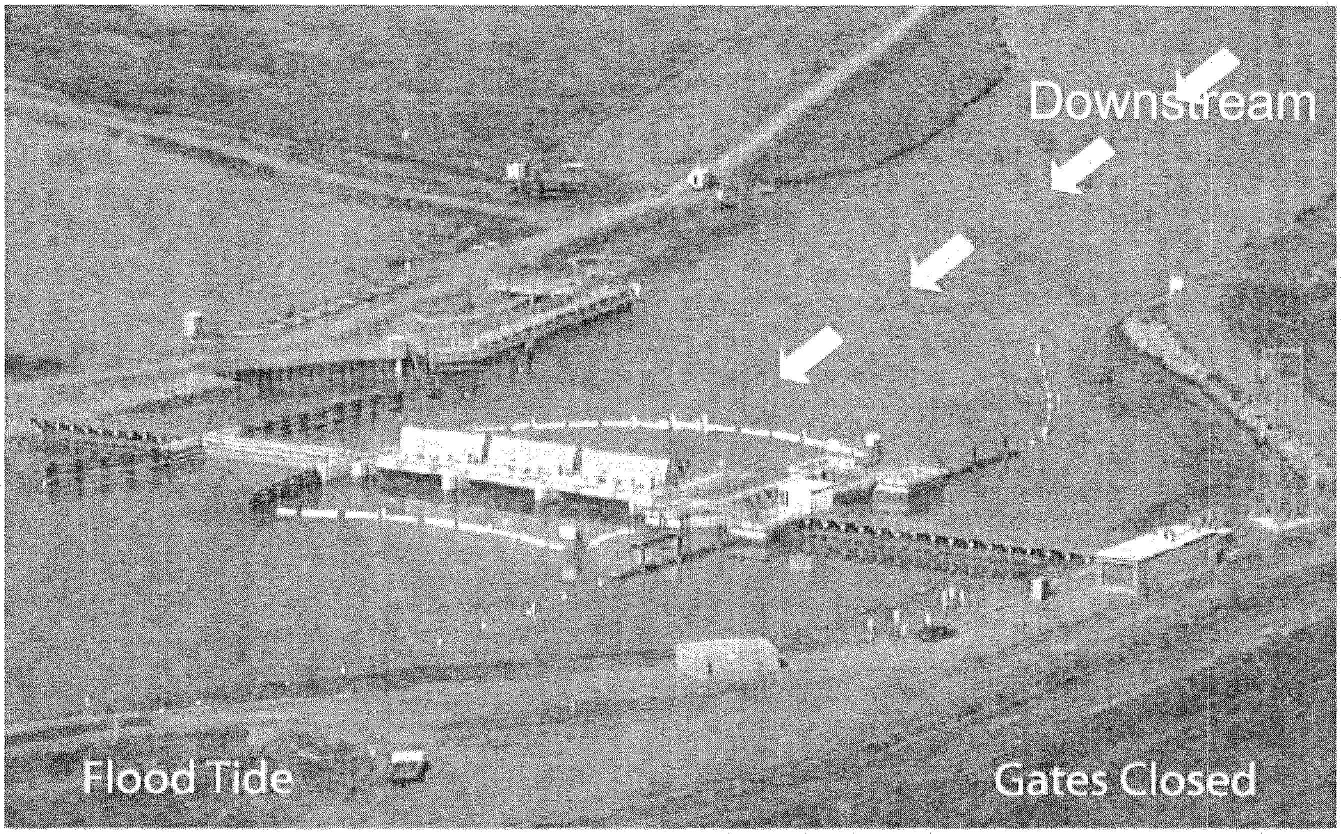



Gates Closed

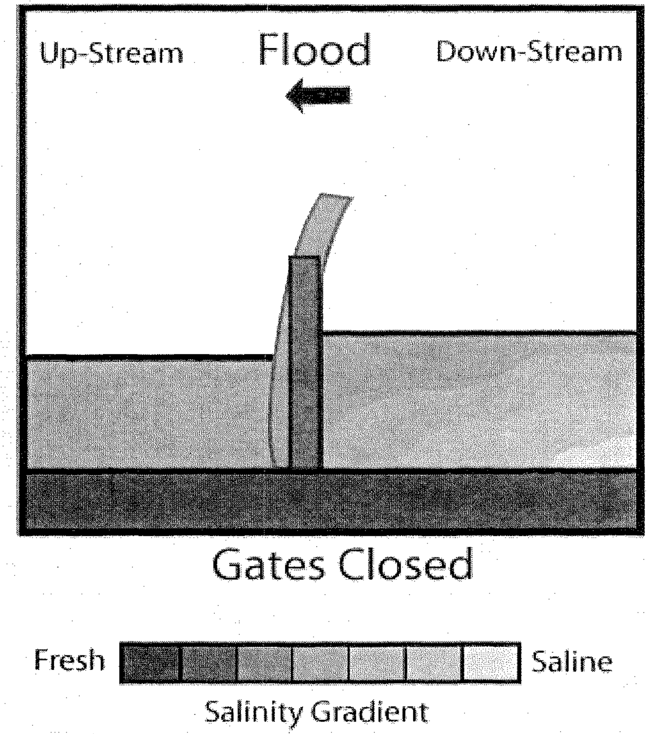


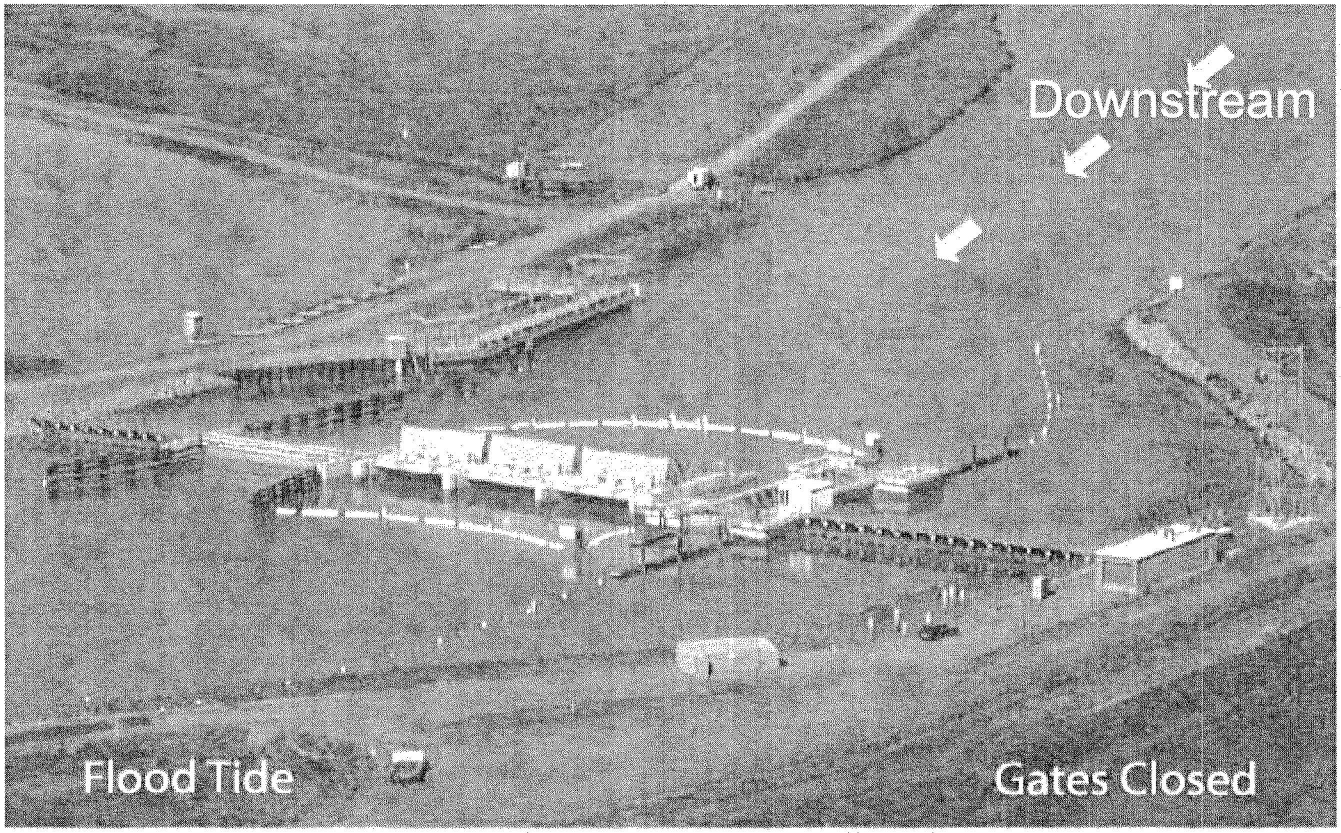

## SMSCG Side View



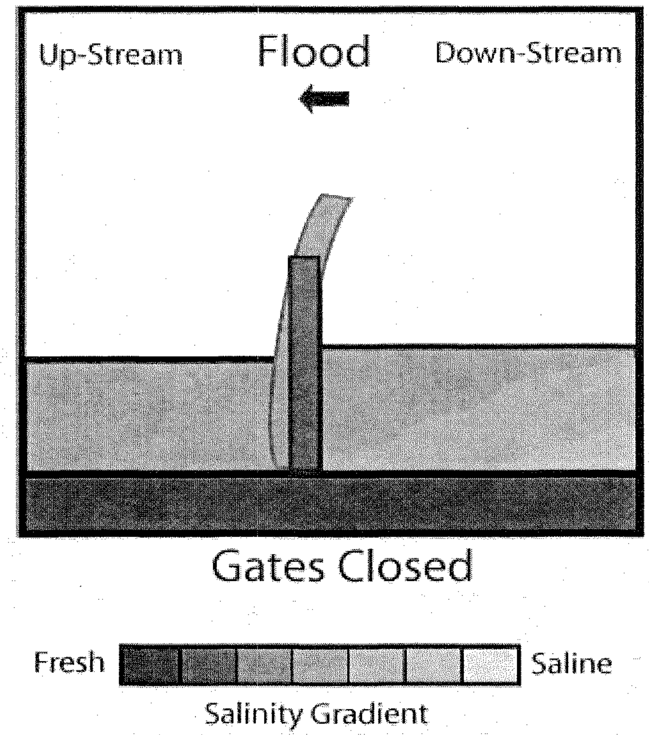



## SMSCG Side View






## SMSCG Side View

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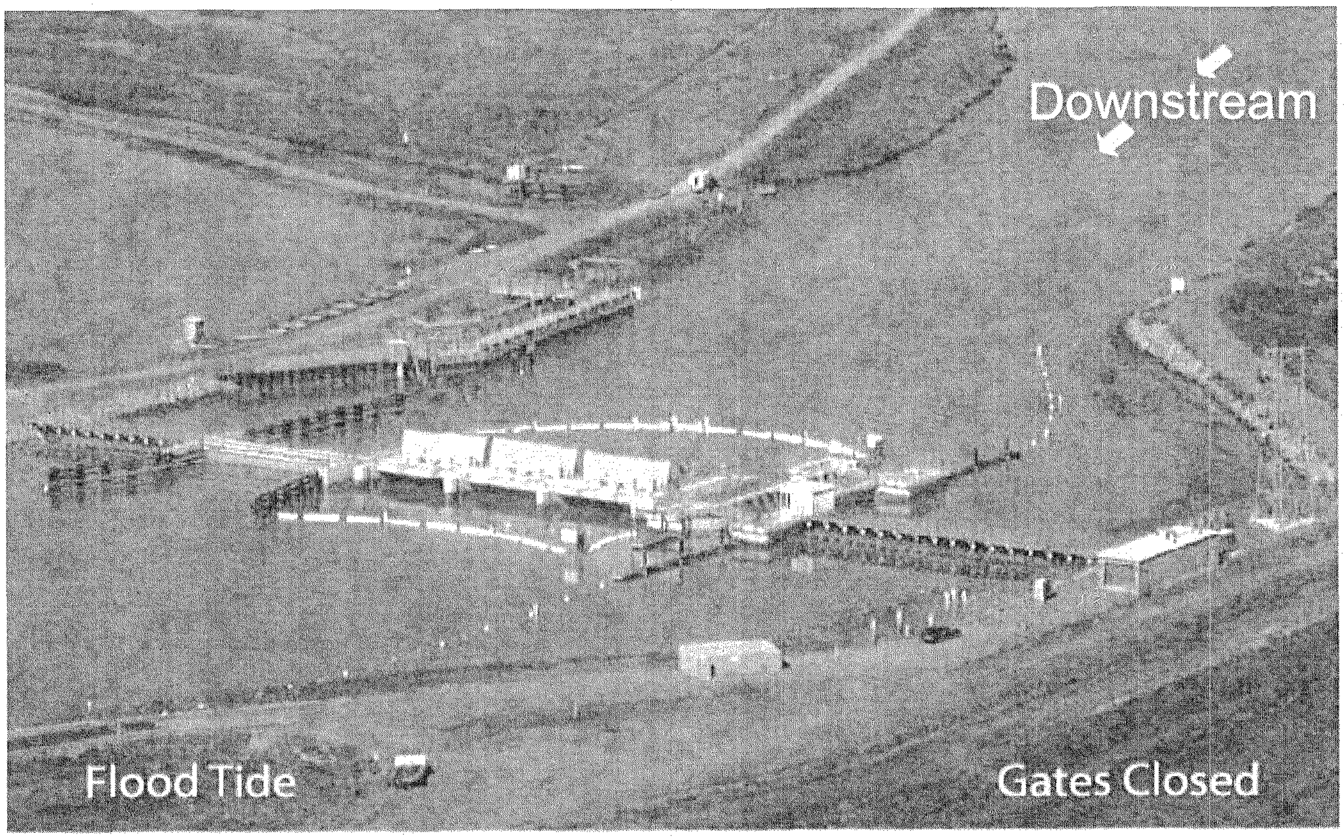
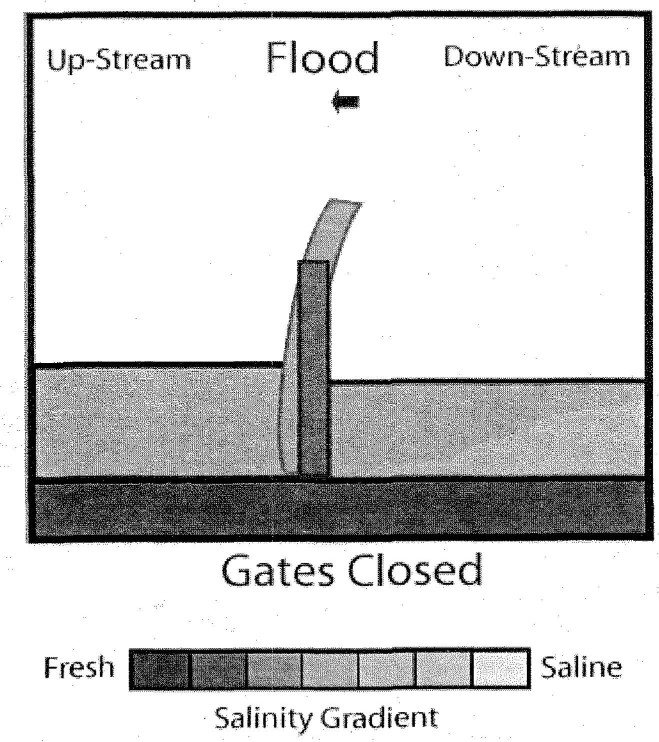



## SMSCG Side View

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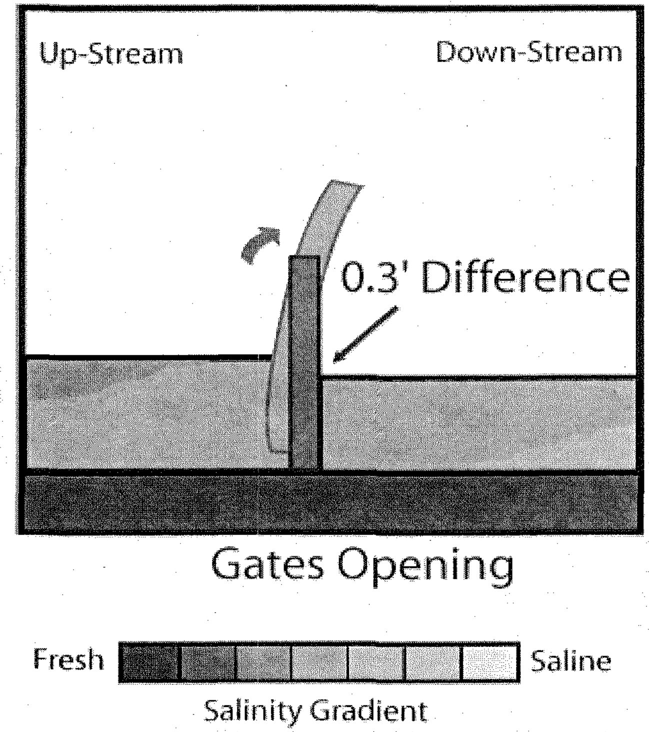
## SMSCG Side View

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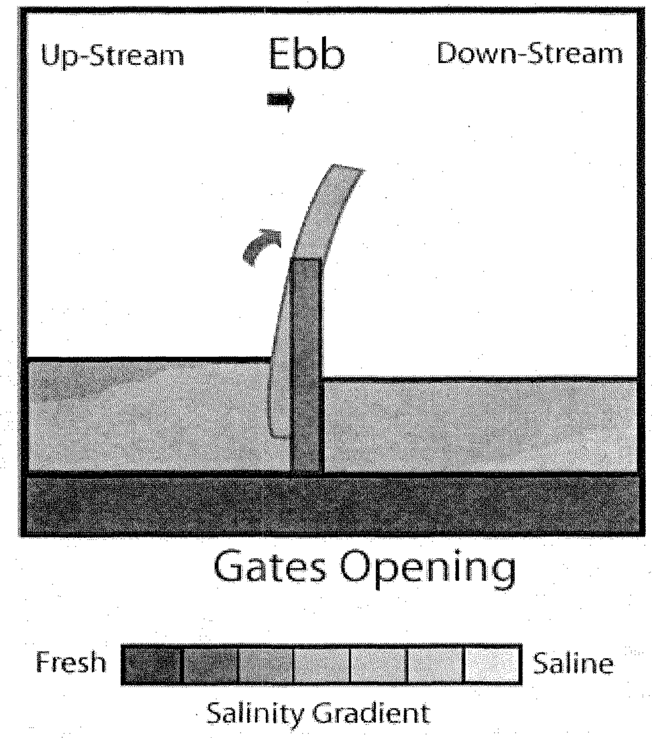
## SMSCG Side View

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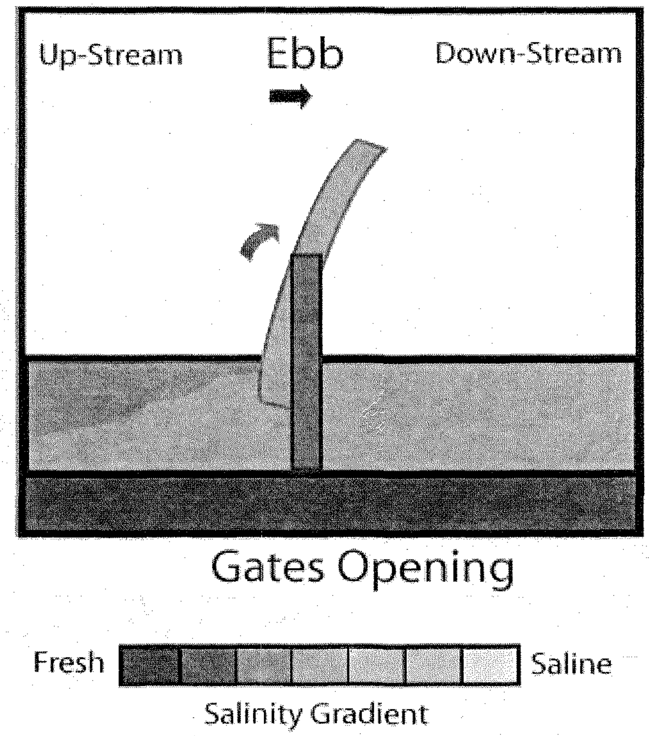
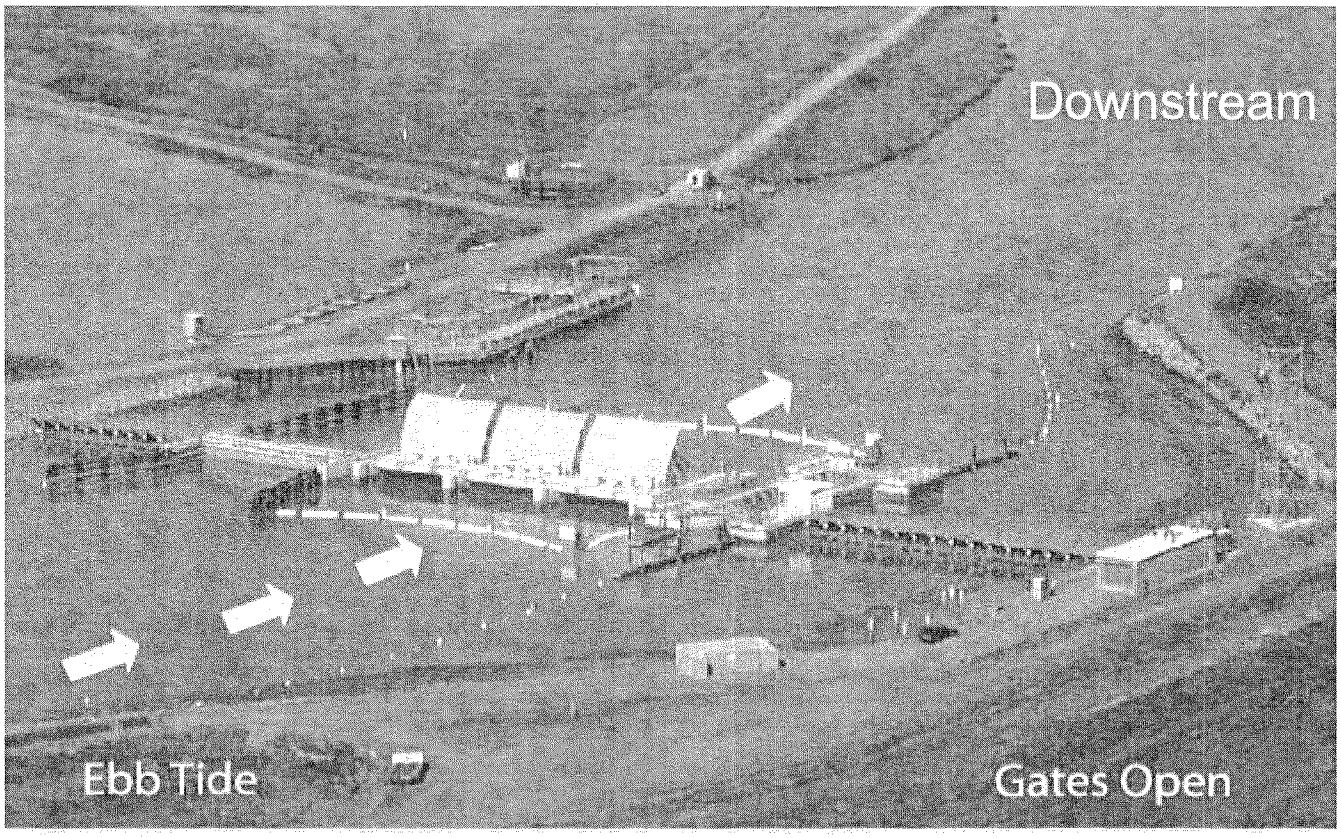
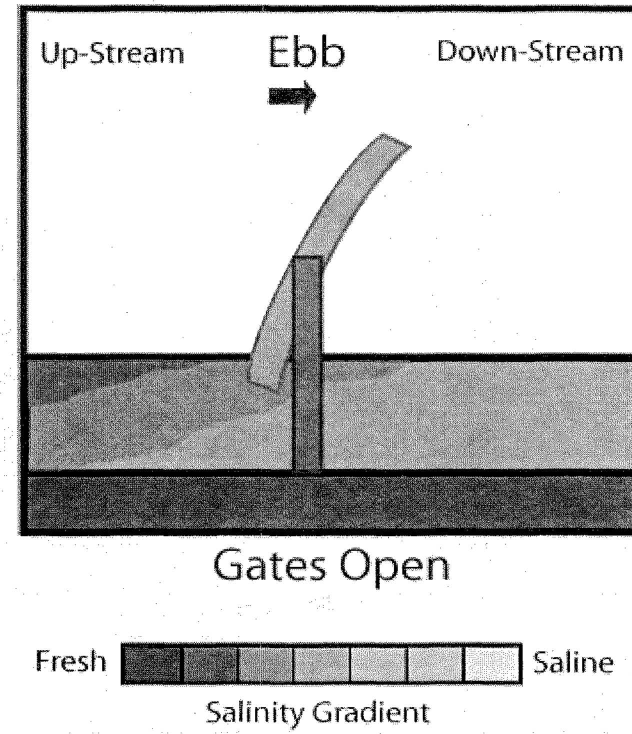
## SMSCG Side View






## SMSCG Side View

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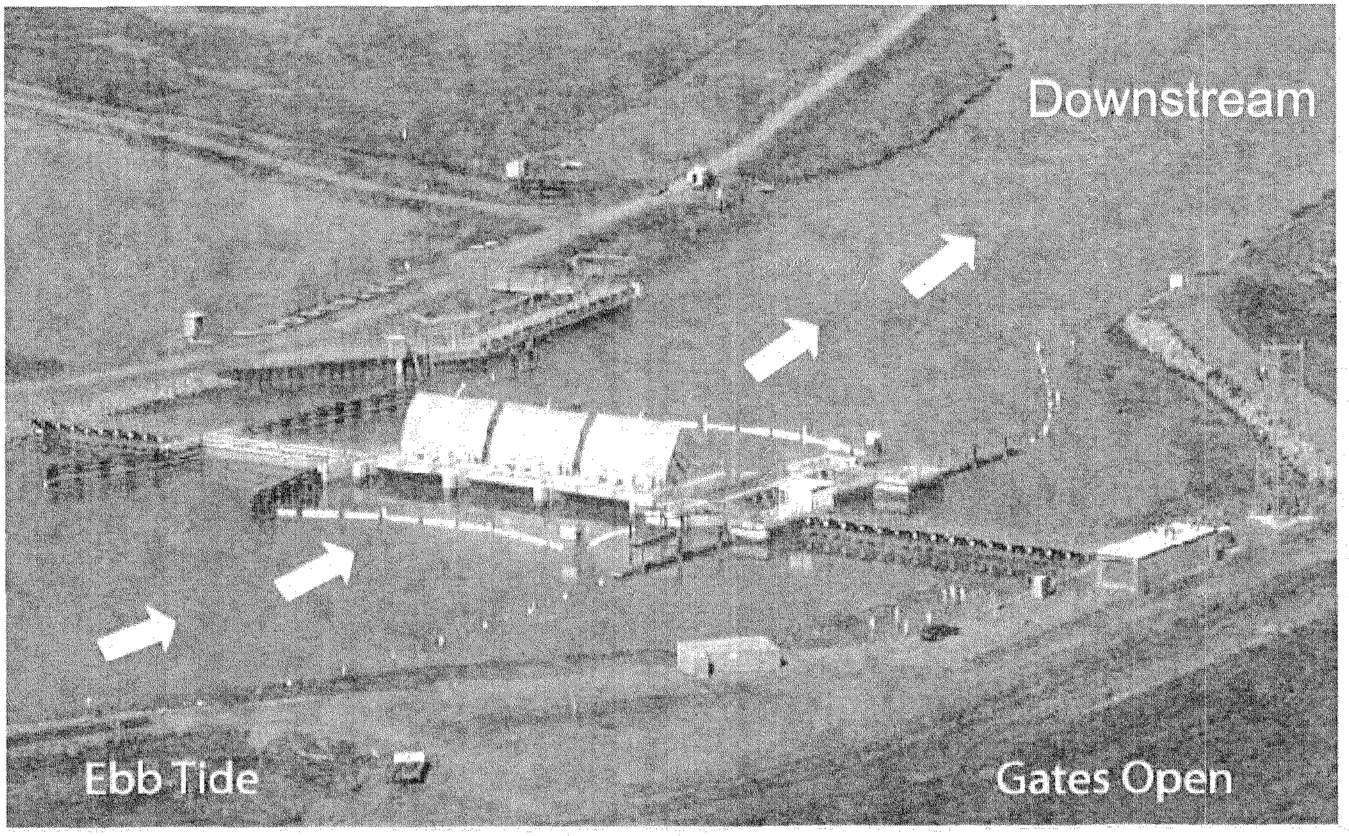
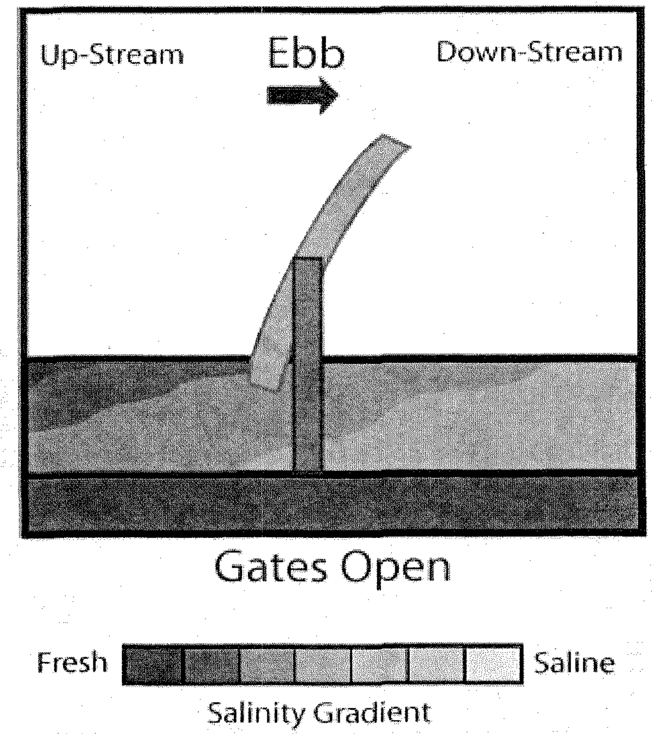



## SMSCG Side View

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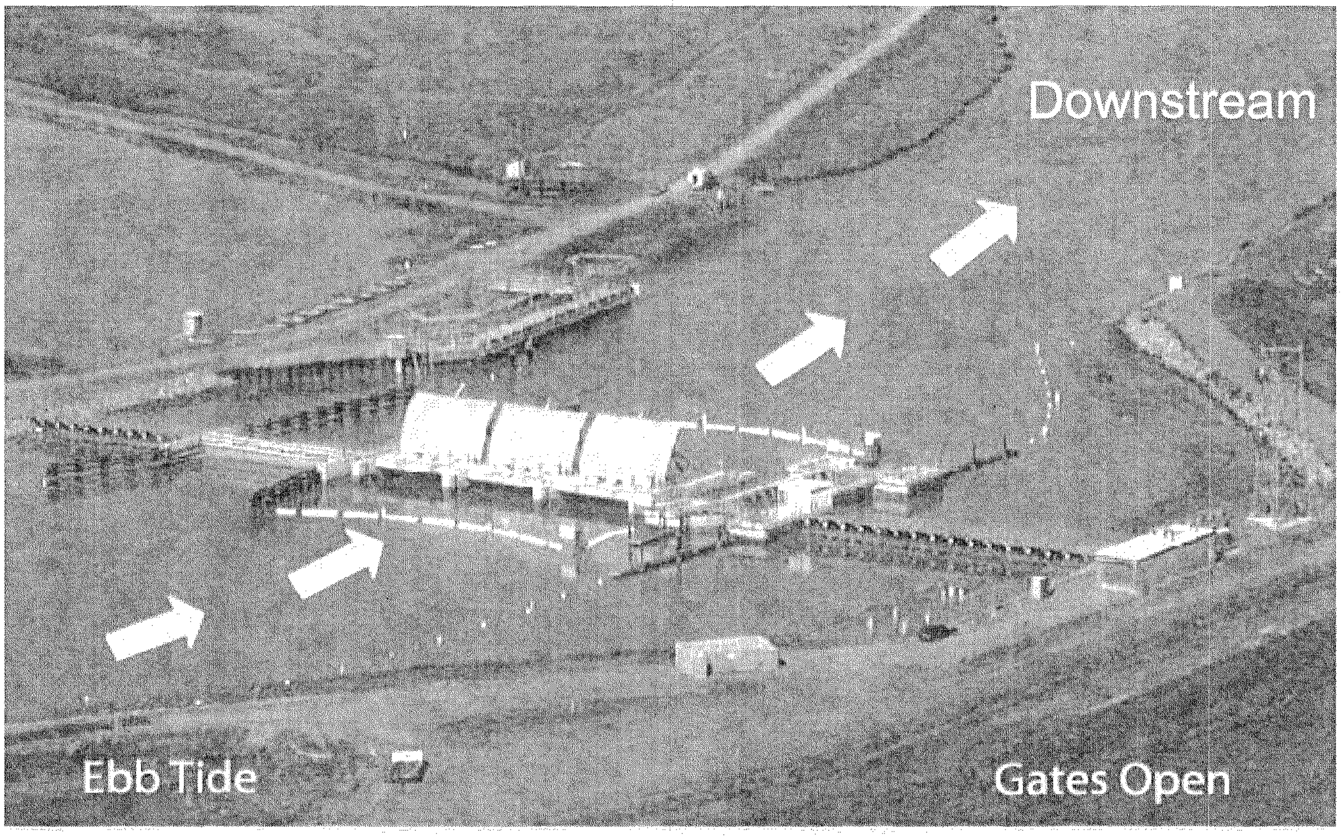
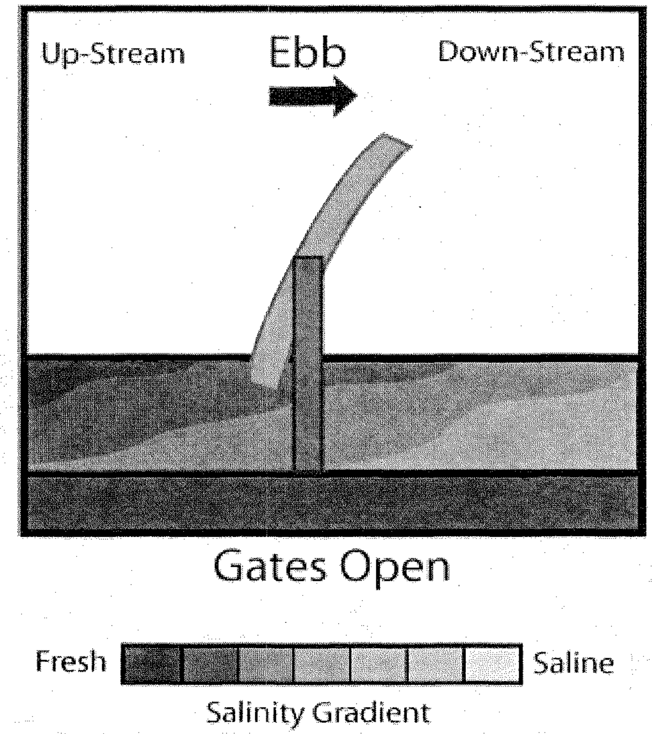
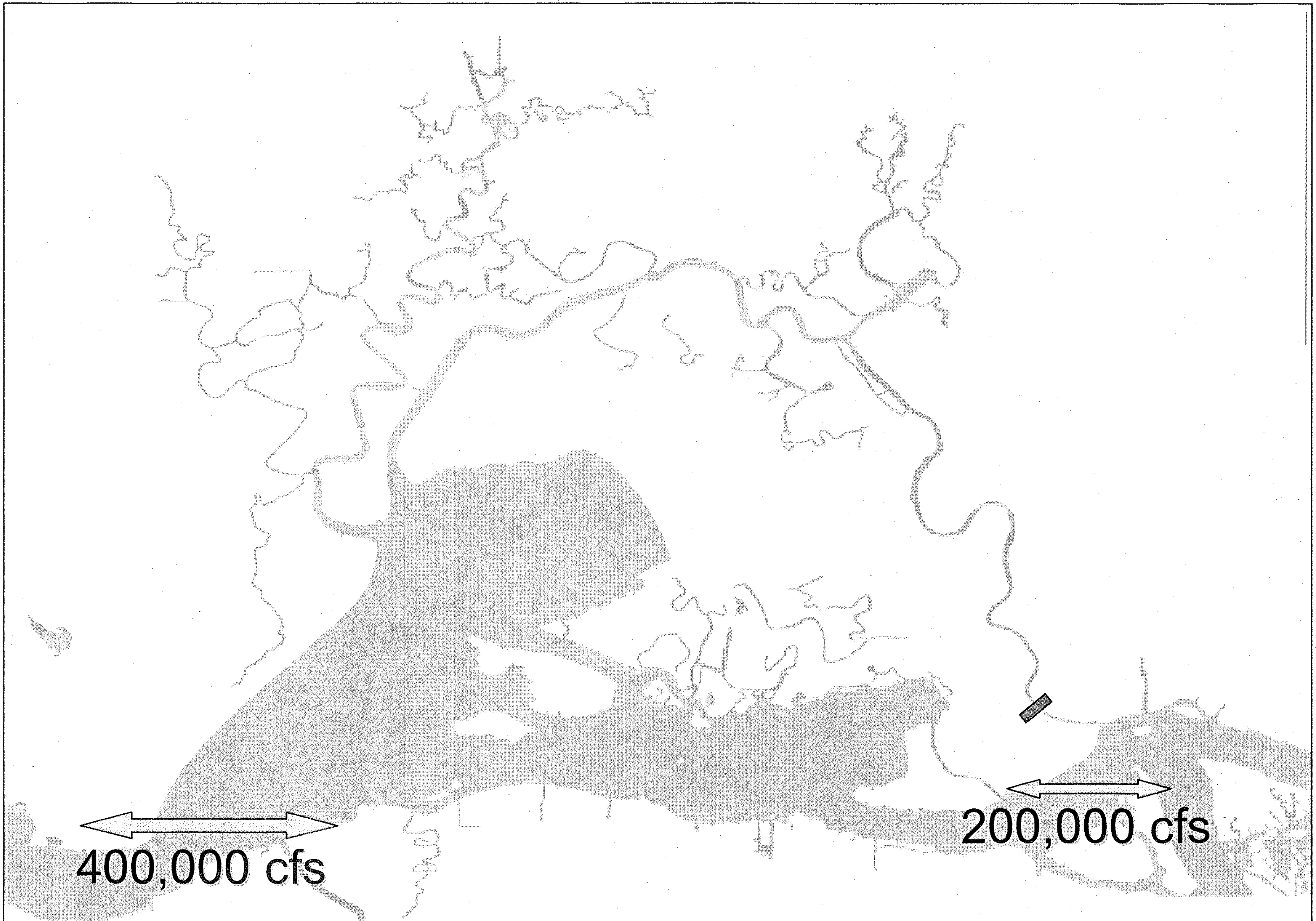


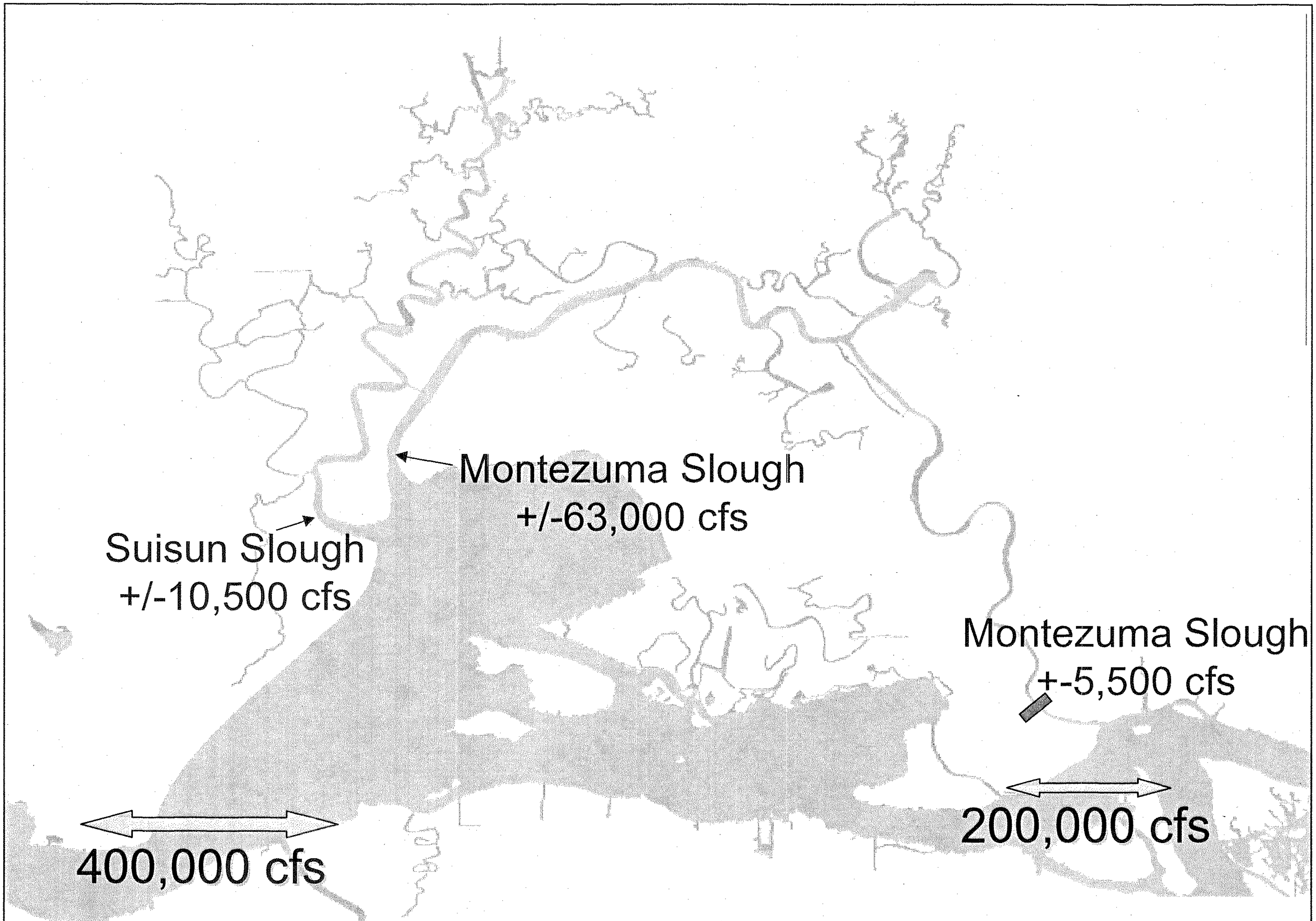

## SMSCG Side View



# Tidal Time Scale Flows



# Tidal Time Scale Flows

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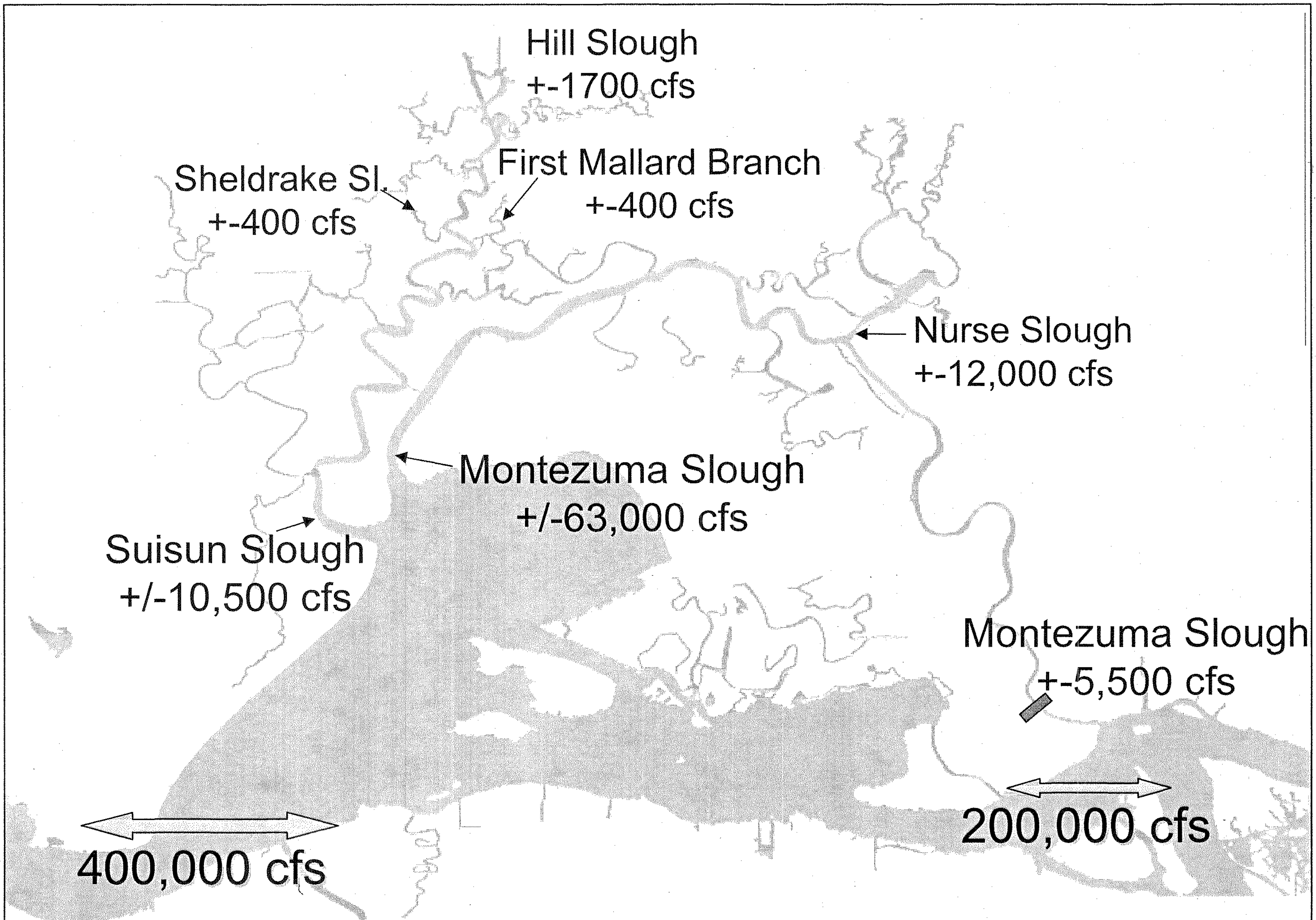
# Tidal Time Scale Flows

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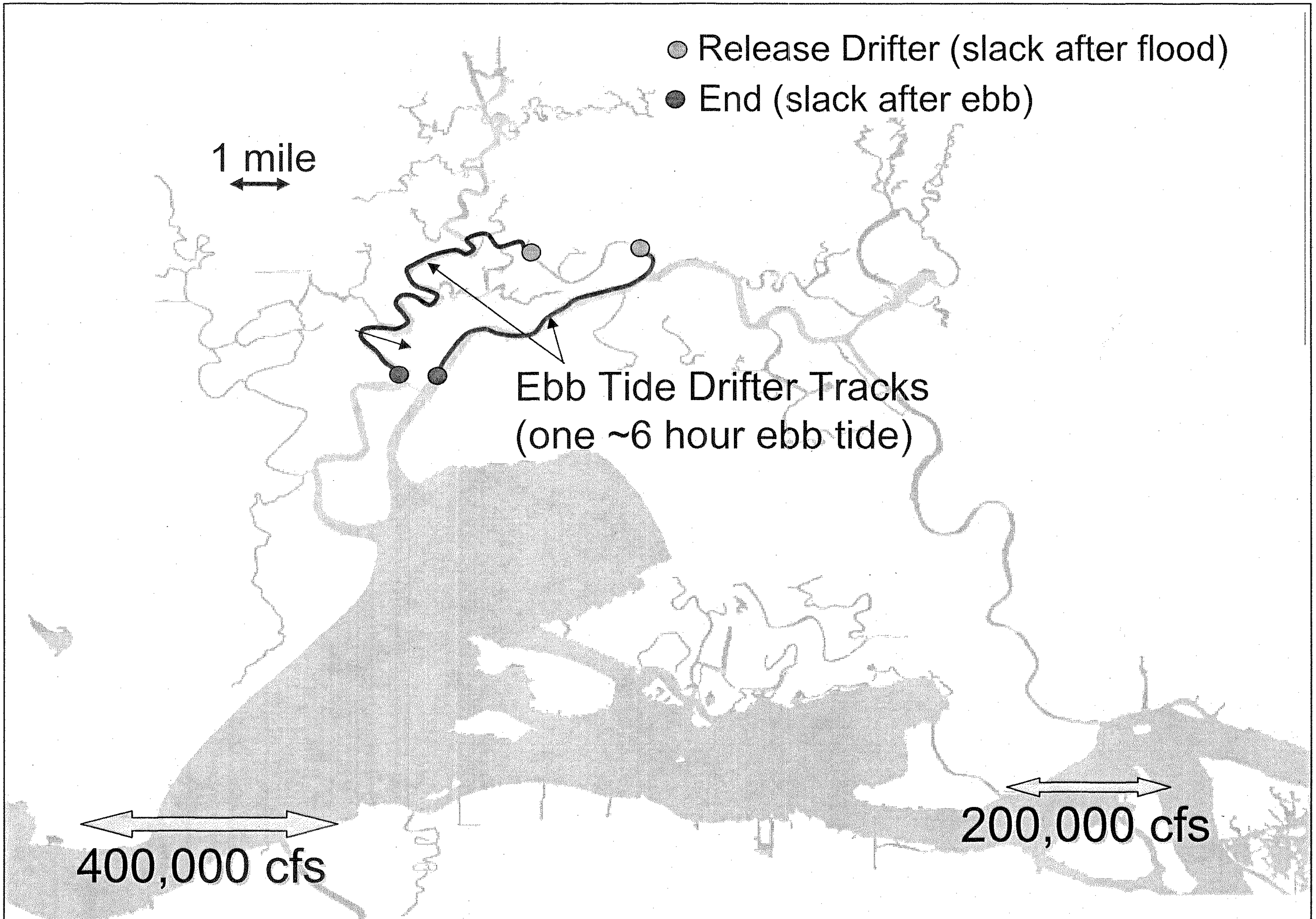
# Tidal Time Scale Excursion

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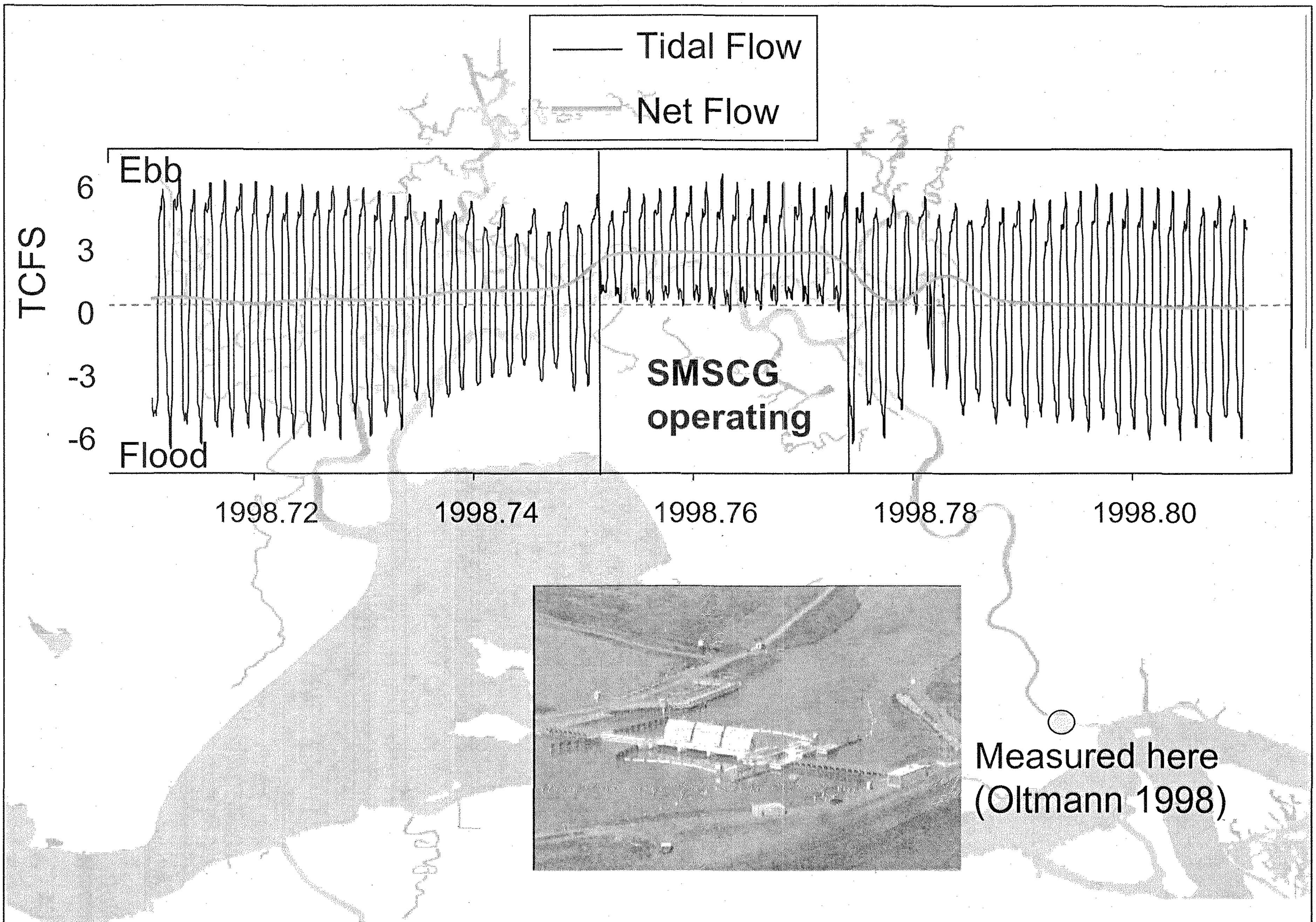
# Tidal Time Scale Flows

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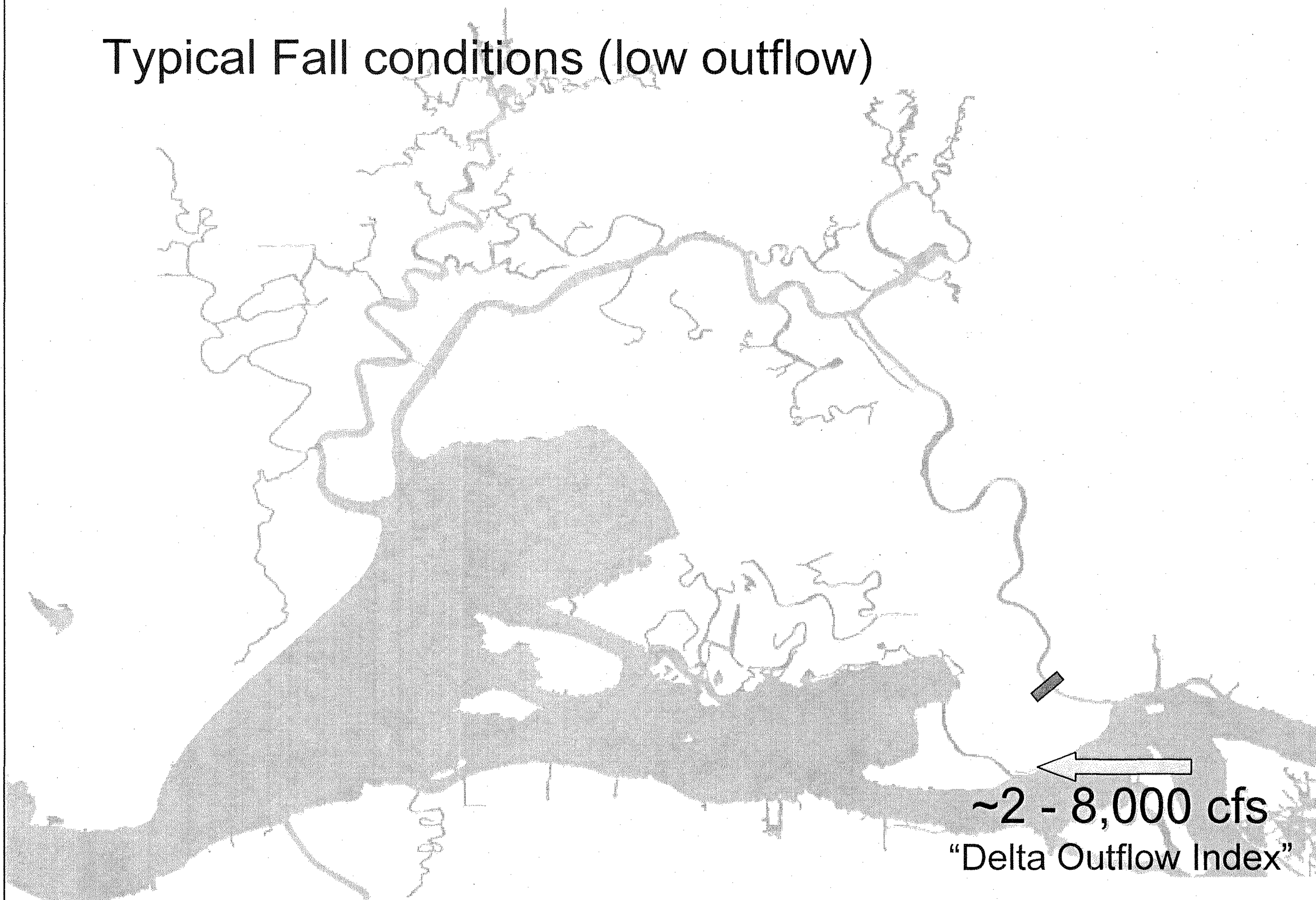
# Sub-tidal Time Scale (“Net”) Flows

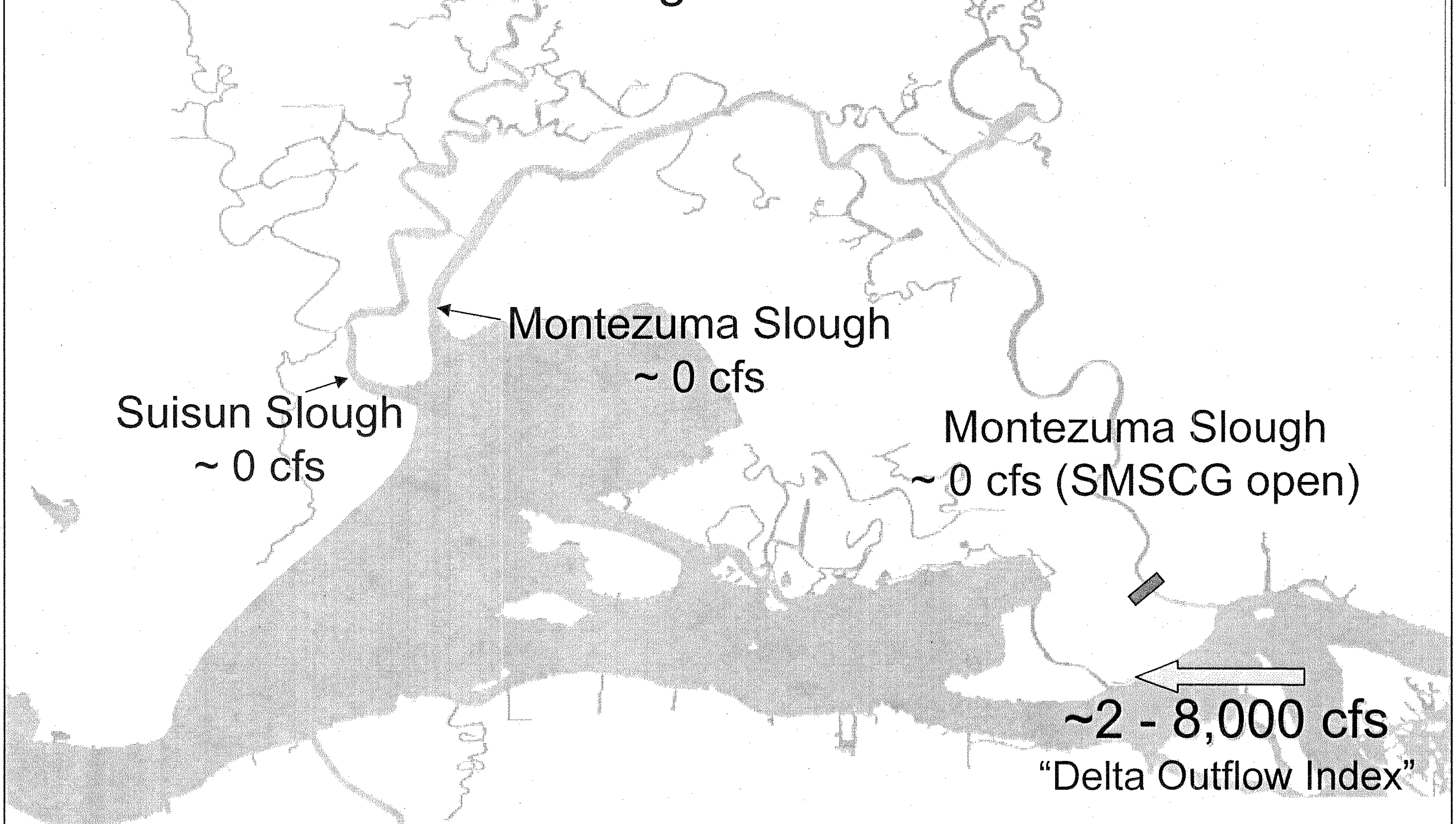
Typical Fall conditions (low outflow)



# Sub-tidal Time Scale ("Net") Flows

Typical Fall conditions (low outflow)

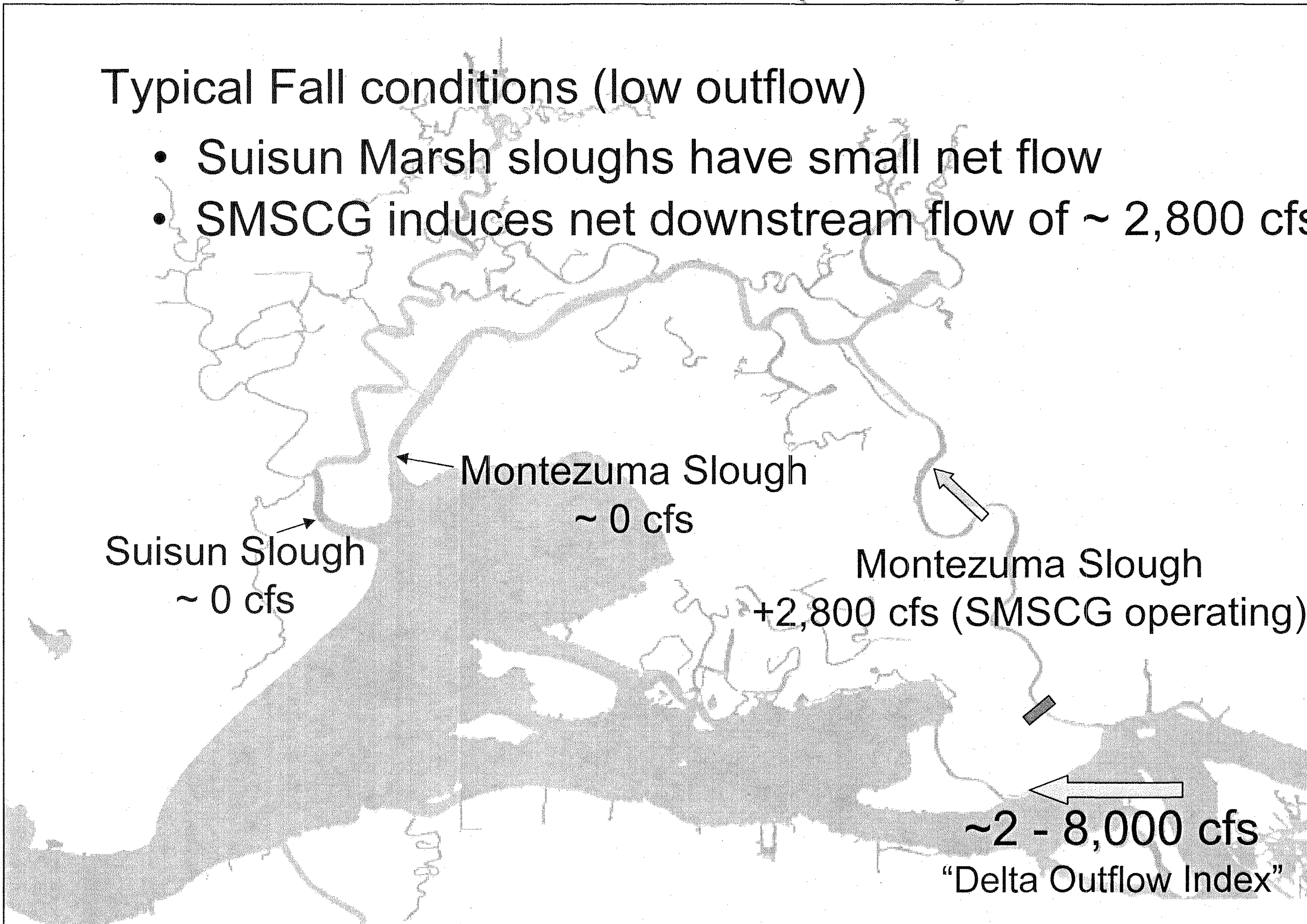
- Suisun Marsh sloughs have small net flow



# Sub-tidal Time Scale ("Net") Flows

Typical Fall conditions (low outflow)

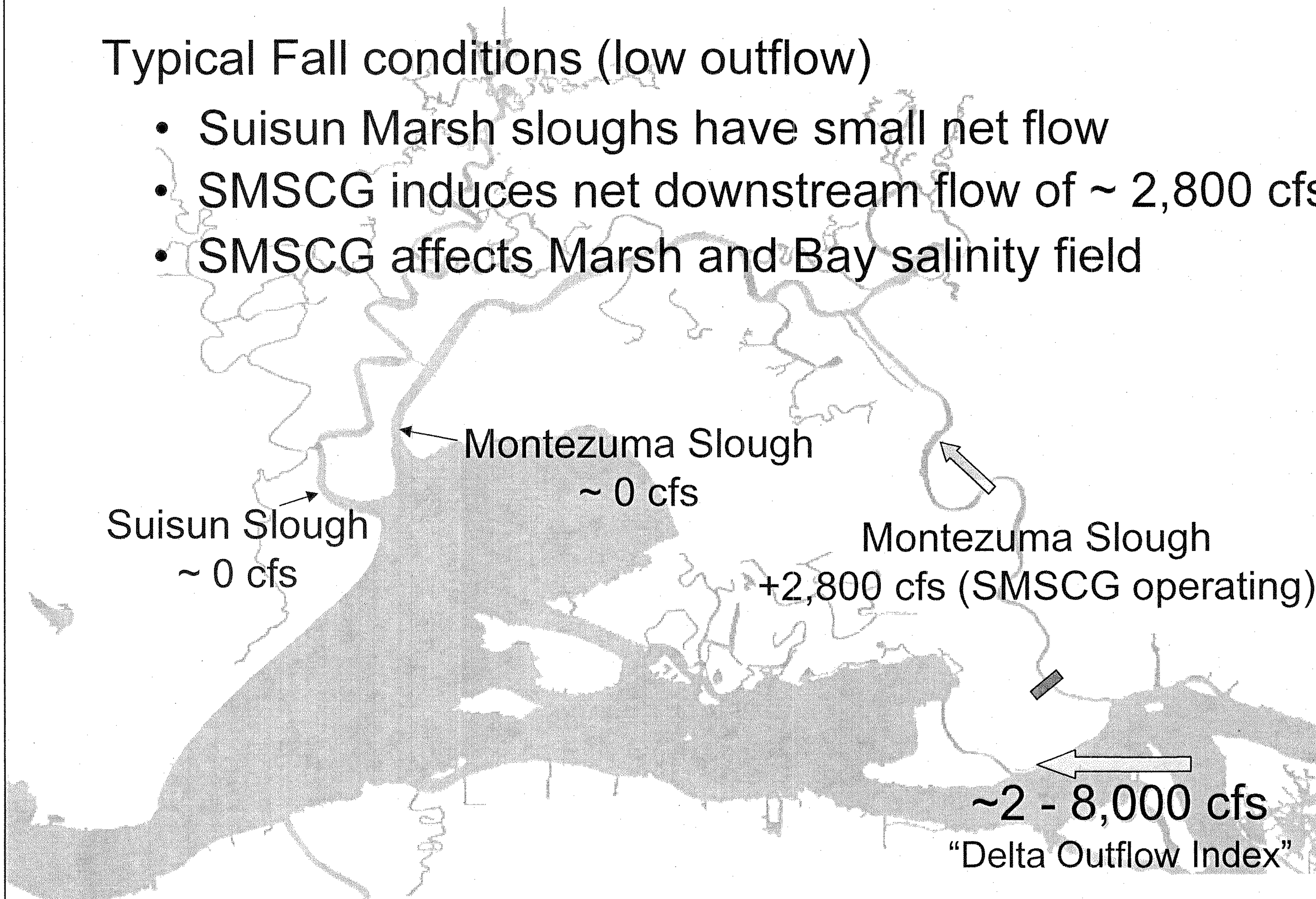
- Suisun Marsh sloughs have small net flow
- SMSCG induces net downstream flow of ~ 2,800 cfs



# Sub-tidal Time Scale ("Net") Flows

Typical Fall conditions (low outflow)

- Suisun Marsh sloughs have small net flow
- SMSCG induces net downstream flow of ~ 2,800 cfs
- SMSCG affects Marsh and Bay salinity field

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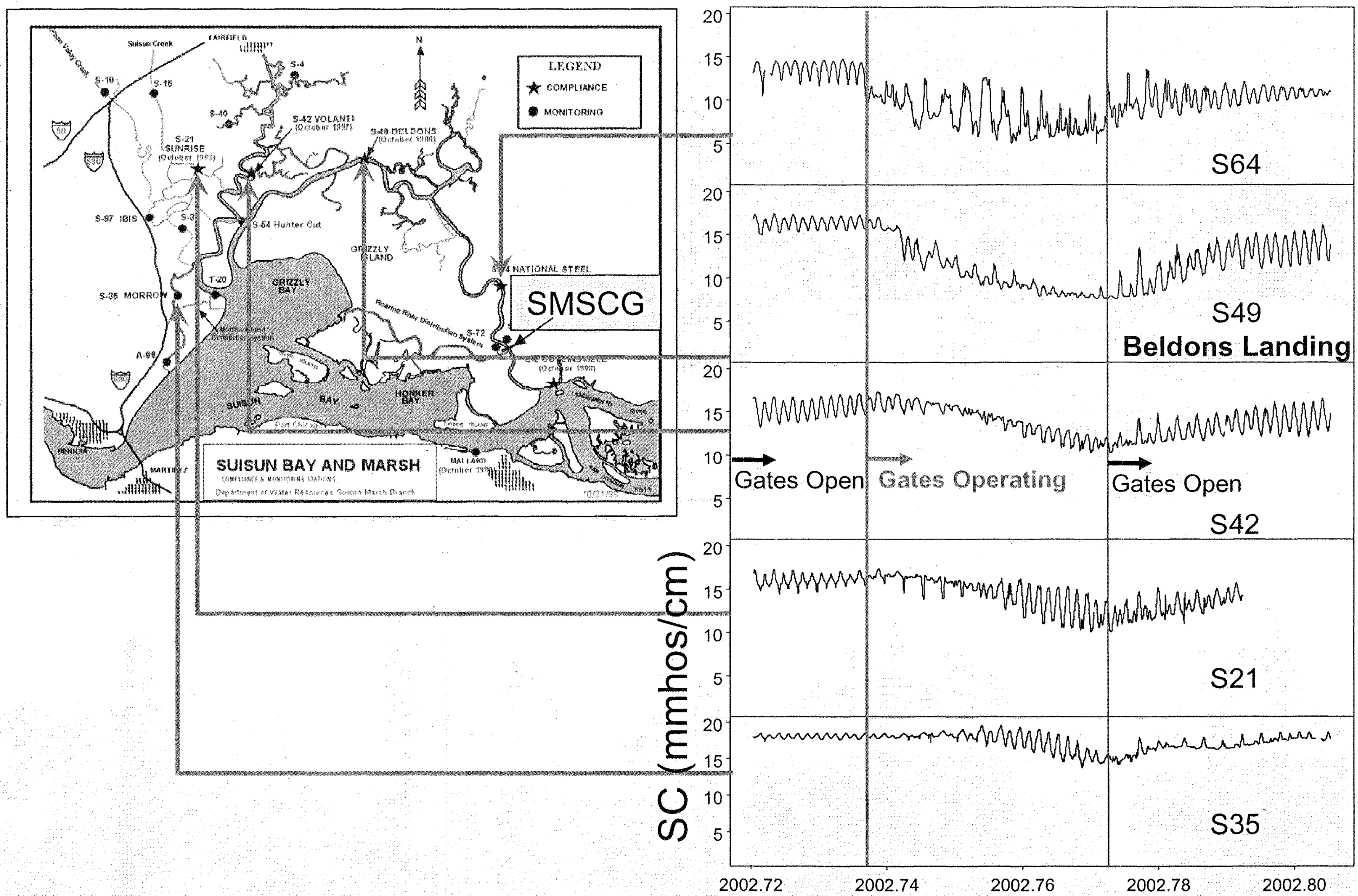
# Salinity Response to SMSCG Operation

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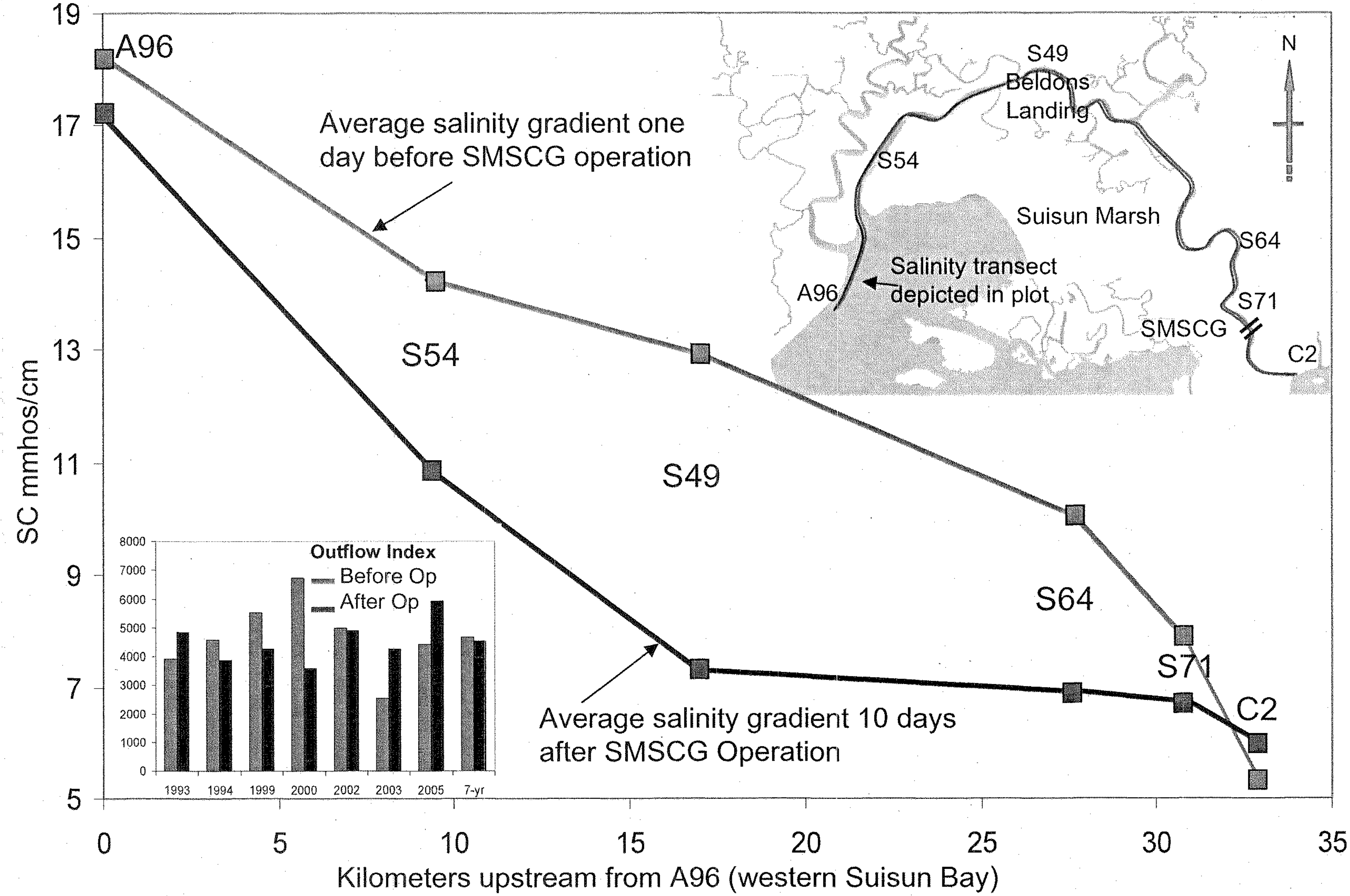
# SMSCG effect on Montezuma Slough

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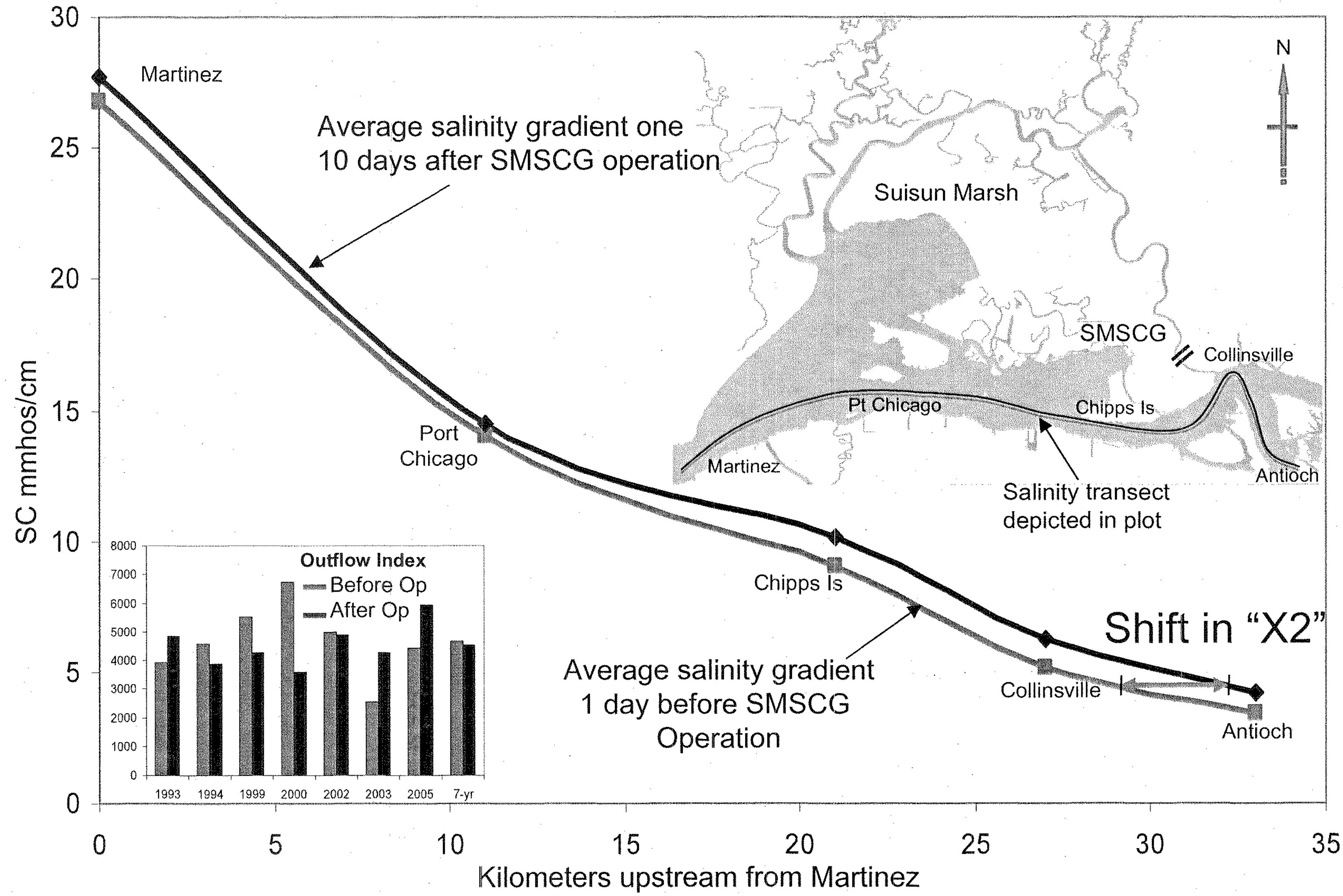
# SMSCG effect on Suisun Bay

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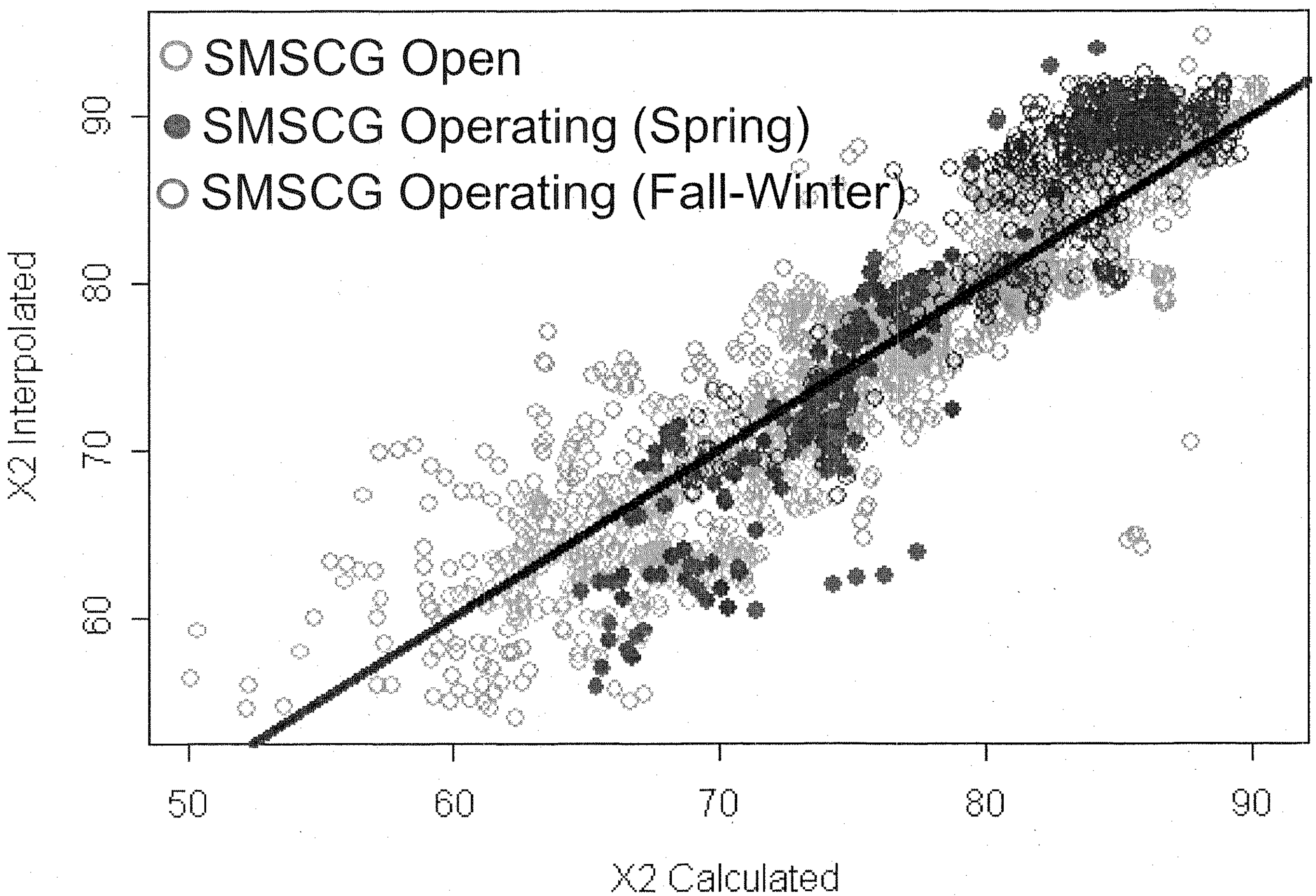
# Interpolated and Calculated X2: Effect of Suisun Marsh Gates




Courtesy Wim Kimmerer

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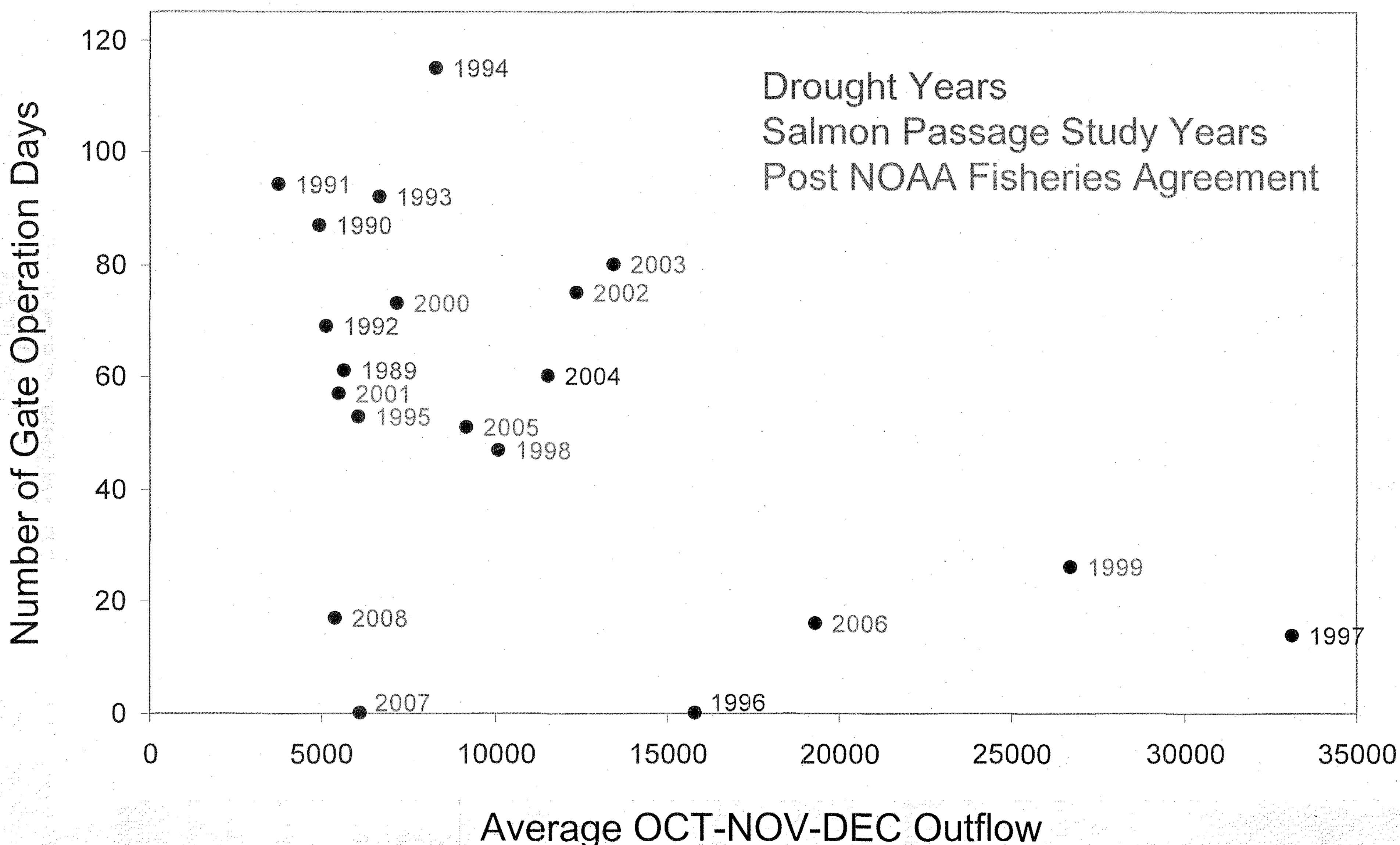
# SMSCG Operation Frequency Versus Outflow

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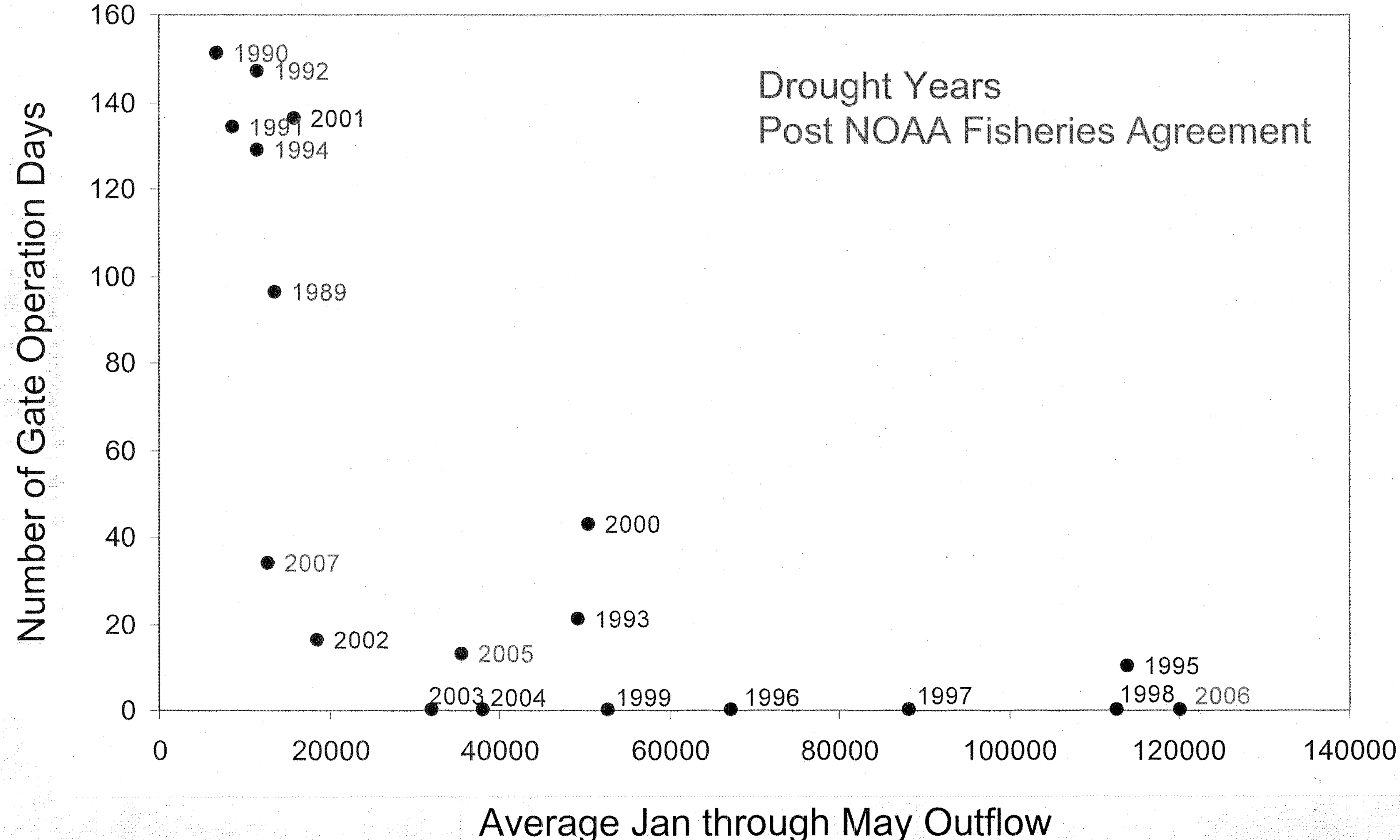
# SMSCG Operation Frequency Versus Outflow

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# Thank You

- Paul Massera
- Jim Sung
- Kate Le
- Brad Tom