

South Delta Progress Report

Low Dissolved Oxygen In the San Joaquin River

History and Background

Dissolved Oxygen (DO) concentrations have decreased to below the 5-mg/l standard between June and November in the San Joaquin River near Stockton. The main channel near Stockton has been identified as a candidate Bay Protection and Toxic Cleanup Program hot spot. It appears that low DO concentrations occur over a 10-mile reach of the San Joaquin River and can reach as low as 2.5 mg/l in fall. At the bottom of the river, the DO reaches zero at times. These low DO concentrations are called an "oxygen sag" and may act as a barrier to upstream migration of adult San Joaquin fall-run chinook salmon that migrate upstream to spawn in the Merced, Tuolumne, and Stanislaus Rivers between September and December.

Oxygen-depleting substances originate from a variety of sources. Common sources are degrading organic material from in-stream plants or plant matter from dry season stormwater discharges. Agricultural drain water (irrigation return) also may carry oxygen-depleting substances. Unpermitted wastewater from industries also contains oxygen-depleting substances and nutrients. Nutrients promote the growth of algae and other water organisms. When these organisms die or respire, they exert a demand on oxygen in the stream. Some industrial wastewater and some eroded soil in the river water contain nutrients.

Progress

The Central Valley Regional Water Quality Control Board started a stakeholder driven process to develop a Total Maximum Daily Load (TMDL) allocation for the discharges to the river. CALFED initiated a Workgroup to gather CALFED Stakeholder input on the process that the TMDL Group is using and how that process fits with the CALFED objectives.

There is good correlation between the two programs. Both programs have the same goals and are approaching the problem the same way. Therefore, the CALFED Workgroup will likely meet on an infrequent basis to discuss funding of the studies needed to identify sources and causes and to develop mitigation alternatives.

The both groups have decided to move forward with a two track approach:

Determine sources and causes of the low DO conditions

Study various means of eliminating the low DO conditions

The TMDL group is currently working on a Project Master Plan that will include the following:

1. A Rough Cut load Allocation based on current information and conceptual modeling will be developed by December 1999 or January 2000.
2. Initiate studies of the different facets of the conceptual model to verify which sources are involved and to what degree. Currently underway.

3. Evaluate existing methods of reducing loads that contribute to low DO based on the Rough Cut Load Allocation, beginning after the Rough Cut Load Allocation is submitted.
4. Present progress to the Regional Water Quality Control Board in December 1999.
5. Complete development of the Technical TMDL and an Implementation Program to be submitted to the Regional Board by December 2002.

This TMDL group has many successes. A few of the successes should be mentioned here. These qualities, coupled with goals common with CALFED, make this a good surrogate work group for CALFED.

1. There is significant agricultural interest - the TMDL Group chair person is with the California Farm Bureau - there are a few other local Farm Bureau representatives in the group. Comments from the Farm Bureau indicate they endorse the approach.
2. Good stakeholder involvement - Many state and federal agencies, as well as local agencies are participating. Universities are also participating in the research portion of the program.
3. Regional Board and CALFED progress - In this situation, the Regional Board is required by the US EPA to develop the TMDL. CALFED wants to see an end to the depressed DO. The group is moving toward doing both.
4. CALFED funding has made the source investigation possible, moving this project along on schedule. A presentation before the Central Valley Regional Board is scheduled for December 1999. Board staff is pleased with the progress and we believe the Board will also be pleased.

Where Do We Go from Here?

CALFED staff intends to participate in funding and planning to make a few more steps of this program come to fruition. These steps are:

1. Fund investigation of mitigation measures of the most likely industries to need to reduce loading.
2. Fund in-stream mitigation feasibility studies.
3. Participate in funding subsequent years of source identification studies.
4. Identify funding sources for the above studies.
5. Participate in project selection if the March 2000 Water Bond passes.