Lehman Mar 15, 2002

Review comments on Stringfellow and Quinn report "Discriminating between west-side sources of nutrients and organic carbon contributing to algal growth and oxygen demand in the San Joaquin River" January 20,2002 version.

General. The results were clearly and succinctly presented and the report was well written. You do need to re-read the text for properly spelled, but inappropriately placed words (e.g., pg. 1, para 4, l 2 or pg 16, para 4, l 2).

I am concerned about the conclusions. You did not demonstrate that ortho-phosphate was limiting or that BOD additions to the San Joaquin River were high or significant from Mud or Salt Slough.

I think the paucity of data was a major problem. A good conclusion might be that the data are suggestive or inconclusive and more information is needed.

I've included some specific comments below. Feel free to contact me anytime for further discussion. (916) 227-7551.

Specific comments

Pg.	Para	line	
i	2	3	Living biomass should also be evaluated as chlorophyll *a* plus phaeophytin. Table IV-7 suggests you have phaeophytin. What don't you mention it and why didn't you include it in the analysis.
2	2	6	My studies showed ammonia was the driving force behind BOD in the channel, not chlorophyll. Carbonaceous demand or total pigment came in second in regression models.
2	4	3	According to Carl, his model works really well. Is there anything in the report that specifically says this or is it your personal interpretation? Include the specifics for your statement that the model does not accurately predict chlorophyll?
2	4	5	The chlorophyll *a* decline in the 1980s was associated with high streamflow, export and a resulting shift in environmental conditions. It was not due to decreased nutrient concentration (Lehman, P. W. 1992. Environmental factors associated with long term changes in chlorophyll *a*

			concentrations in the Sacramento-San Joaquin Delta and Suisun Bay, California. Estuaries 15:335-348.
3	1	2	Data do not support this statement
3	2	10	Your t-statistics suggest something different than your statements. My review of the tables suggests these findings about oxygen demand material: the SLD contributes chlorophyll *a*, but not BOD to Mud Slough but Mud Slough only contributes TOC, not BOD or chlorophyll *a* ; and Salt Slough removes BOD. Tables IV-4, IV-5, IV-6. Please check this through the report for consistency.
Fig. III-1 and 2.			It is hard to see the location of Mud and Salt Slough or other locations on these maps.
Table IV-4 - IV-6.			Add the n value so the statistics can be evaluated. Your data set for each t-test appears small (aprox. 15 values) based on the figures. Using parametric statistics is invalid when the n is small because the assumption of normally distributed data is violated. You should mention if the data were normally distributed or shift to non-parametrics.
15	3	4	There were two days when the BOD was lower. This is equivalent to 25% of the time and not an insignificant outlier.
16	2	4	These CBOD and NBOD measurements should be presented. How often were they taken and how were they measured?
16	3	4	The orthoP is well above limiting values of 0.01 mg/L. How can this be limiting? Algae will remove orthoP and the two are negatively correlated. They would have to be positively correlated for cause and effect. Also, orthoP and totat phosphorus are usually correlated. Did you have a loss of total P that could account for the loss of orthoP. This is suggested by the significant loss of TSS.
16	3	7	It certainly contributes, but the statistics don't suggest chlorophyll *a* is controlling. I agree the figures are pretty suggestive of a contribution by chlorophyll *a*. However, the ammonia also follows the same pattern of high values in late July and August and could just as easily be the controlling factor. The loss of DOC and its influence on BOD was also not discussed. A plot of TOC would be informative since you conclude it is a better variable for estimating BOD.

17	3	1	Why did you force these equations? I suspect the forcing influenced the results. The simple correlation coefficient of 0.5 does not explain more than 25% of the variance. The forced equation gives you more explained variance than the correlation coefficient, but the forcing can distort the data relationships. What happens when you remove forcing and include the intercept? Also, you might be able to get more information from the pigment data if you add phaeophytin or a combined chlorophyll plus phaeophytin variable in your analyses. I would like to see this done.
17	3	4	These are redundant variables and it is surprising to see them together. What were the t statistics and the percent contribution of each variable? Why did you have such high ammonia, but no influence of nitrification? This seems odd. I notice the ammonia measurements were only taken six times. The small data set may be biasing the results and caution about this conclusion is probably important.
17	5	all	This section should be shifted to conclusions or implications.
25	1		The data did not demonstrate that Salt or Mud Slough increased BOD load to the SJ River. See comment 3, 2, 10
25	1	7	Not conclusively presented.
25	2		You haven't proved anything about nutrient limitation. You have shown that orthoP decreases with algal biomass – an expected result. To be limiting orthoP would have to reach limiting values or be positively correlated with chla. Can you show this?
26	1		The correlation between BOD and chlorphyll *a* is low compared with my upstream data and Chris's data. You said there was little nitrification. Any explaination? You demonstrated an increase in chlorphyll *a* in the SLD, but not BOD.
26	2		Absence of phaeophytin is a critical problem in your evaluation of the algal contribution. Phaeophytin often exceeds chlorphyll a. Including this variable in the analysis may be valuable.

			Further, your analyses suggested chlorophyll *a* was poorly correlated with BOD so why are all of these algal studies needed?
26	3	3	Not supported by data in this study
26	6	1	This conclusion needs better support. The correlation was higher, but given the lack of change in BOD at most stations, the effort may not be warranted.
27	1	2	Your preliminary results did not suggest ammonia contributed to BOD, so why are these analyses needed.
Conclusions and Recommendations			
28	2	1	Not supported by data.
28	2	4	These data and analyses were not in the report.
28	4	1	Needs clarification on methods etc.
28	4	4	Not demonstrated in report
28	5	5	Unsupported.
29	2	1	A rapid BOD measurement would be great, but your data didn't suggest BOD was that important. Even if we forget the statistics and just look at the numbers, the added BOD at Mud Slough, the only place an increase in BOD was suggested, was only about 2 mg/L. Is 2 mg/L worth all of this fuss? That BOD was poorly correlated with chlorophyll *a*. This is in conflict with Chris's and Randy's work and should be discussed. Neither Table IV-4, IV-5, or IV-6 support the concept that an increase in BOD was accompanied by an increase in TOC. This conflicts with your statement that TOC would be a good measure of BOD at your monitoring stations. The graph looks reasonably good though. You should discuss this disparity.