Proposal Reviews

#187: Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel

University of California, Berkeley

Initial Selection Panel Review	
Research and Restoration Technical Panel Review	
Delta Regional Review	
San Joaquin Regional Review	
External Scientific Review	#1 #2 #3 #4
Environmental Compliance	
Budget	

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 187

Applicant Organization: University of California, Berkeley

Proposal Title: Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)
Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	**-**
In Part	**-**
With Conditions	**-**
Consider as Directed Action	**-**
Not Recommended	**X**

Amount: **$0**

Conditions, if any, of approval (if there are no conditions, please put "None"):

None.

Provide a brief explanation of your rating:

Technically, reviewer questions/concerns resulted in adequate and poor-excellent ratings, based on questionable feasibility, use of a 2-D model, poorly characterized input data, need for immediate use, extension of results to sustainable management, and understanding of causes of low dissolved oxygen. Strategically, the weaknesses preclude short-term fixes, nor does the proposal benefit the ERP strategy or Implementation Plan priorities.

Research and Restoration Technical Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Research and Restoration Technical Panel Review Form

Proposal Number: 187

Applicant Organization: University of California, Berkeley

Proposal Title: Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;
Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;
Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;
Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Superior	**The present proposal aims to integrate a wealth of pre-existing research on the problem of DO deficits in the San Joaquin River. Several additional previously funded and current proposals are referenced. Review of a single proposal surrounding such a critical topic is difficult without being able to evaluate the entire scope of previous and proposed research. The cross referencing of previous grants and proposed grants begs for consolidation of research efforts by CALFED.** **The basis for the proposed research is sound and of critical importance to the CALFED Bay Delta Restoration Program. The researchers have excellent credentials and would certainly contribute to the knowledge base surrounding the DO deficit in the San Joaquin River, however the need for and feasibility of "real-time forecasting" of the problem is much less certain. Further, extension to sustainable management seems unlikely from the present proposal. Several reviewers questioned the proposals feasibility and raised concerns about the use of a 2-D model and poorly characterized inputs.** **In the panels opinion, the CALFED Bay Delta Restoration Program should convene a special-topic specific panel to deal with this issue in terms of CALFED funded research and model development.**
-Above average	
XAdequate	
-Not recommended	

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

   The central goal of this proposal is to develop a real-time forecasting tool to improve the management of episodes of low dissolved oxygen in the Stockton Deep Water Channel. Sensitive and effective forecasting tools are highly desirable to the CALFED Restoration Program (and to ecosystem managers throughout the world!). More specifically, the periodic dissolved oxygen deficit within the Stockton Deep Water Channel is a critical problem for the CALFED Restoration Program and is in need of immediate and sustained attention.

   The present proposal is certainly justified in terms of the well-documented problem of low DO within the lower San Joaquin River. A basic and well understood general conceptual model is presented. However, the proposal is somewhat weak in justifying the need for real-time forecasting of DO and how that would be used in rapid management responses.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

   The approach, as described, is vague in terms of meeting the proposal's central objective. The results will certainly add to the base of knowledge about the San Joaquin's DO deficit and it is likely to generate novel general information. In theory, the approach would yield critical information for managers, but in reality the described approach is very ambitious and successful outcome is less than certain.

   Reviewers recognize the high degree of difficulty in the real-time model that is proposed. Research within the Delta has produced competing hydrologic models, so the combination of a hydrologic model coupled with biological/chemical reactive constituents in a watershed with extremely complex tidal and riverine interactions is clearly a major scientific challenge.

   In general, the performance measures are not crystal-clear in terms of the project's ambitious central goal (see #1).

   CAPABILITIES: Excellent track records and qualifications

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

   The authors' track records suggest that thoughtful and thorough work will be generated and published. The specific products in terms of the CALFED Restoration Program are not certain. The stated goals are ambitious and if fully accomplished would be of great utility to the CALFED Project, but the proposal hinges on the integration of modeling efforts that incorporate complex hydrologic, chemical loading, and biologic components. Several reviewers raised serious concerns about the models inputs and thought that successful implementation of a real-time model was unlikely.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The budget seems high in terms of model improvement. Much of the input information has been previously generated and the authors have prior experience with the hydrology and biogeochemical issues associated with the catchment.

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

   MEDIUM and MEDIUM----- Reviwers questioned feasibility.

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

   OK

Miscellaneous comments:

None

Delta Regional Review:

Proposal Number: 187

Proposal Title: Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel

Overall Ranking: **-**Low **X**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

Overall, the project addresses needs in the Delta. The committee did not see immediate importance to the project and had some questions about feasibility.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   PIs have experience with the complexities of the DO problem in the Stockton Ship Channel. Clearly familiar with the hydrology, climate, necessary equipment, and with monitoring stations in the area. They also very familiar with the model proposed. Coordination of realtime data with a complicated system of discharges and with instream aerators seems like a possible stretch. And the group had concerns about the ability of this real-time system to be implemented with water system operators.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   Low DO impairs water quality in the Ship Channel and may create a barrier to fish migration. Proposal also could create foundation of data for adaptive management of discharges tot he San Joaquin.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

   Project fuses aspects of three existing CALFED implementation projects. Also, adaptive management through real-time water quality management is a current CALFED-sponsored initiative. Project relates to programs reducing contaminant loading from Panoche-Silver Creek and local water districts. Oxygenation research will tie in with plans to oxygenate State water Project reservoirs.

4. Does the project adequately involve local people and institutions?

   XYes **-**No

   How?

   Local water district, duck clubs, and stakeholders from the SJ River DO TMDL process have been, or will be, involved.

Other Comments:

The group was concerned about redundancy in modeling efforts, too many models are being used in the Delta. Some concerns expressed about handling the scale of the data. And the group had concerns about the ability of this real-time system to be implemented with water system operators.

San Joaquin Regional Review:

Proposal Number: 187

Applicant Organization: University of California, Berkeley

Proposal Title: Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel

Overall Ranking: **-**Low **X**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

A system like this has great potential to improve management of the low DO problem, but potential won't be realized until there is a clearer understanding of the causes of the low DO problem, esp the contributions from the upper basin.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   It will build on several years of effort, integratig findings and identifying gaps in data and understanding.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   Has the potential to optimize management of the low DO problem, so cost-effective decisions can be made. Critial for fish passage.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

   Links to Stockton low DO TMDL, San Joaquin Real Time netwrok, and Grasslands Bypass Project, as well as several other proposals, and consistent with VAMP.

4. Does the project adequately involve local people and institutions?

   XYes **-**No

How?

Via interaction with standing committees working on low DO and ag drainage issues.

Other Comments:

None.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **187**

Applicant Organization: **University of California, Berkeley**

Proposal Title: **Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;
Good: quality but some deficiencies;
Poor: serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**This is an ambitious proposal which, if everything goes as planned, will result in a very usable product and forecast model of DO dynamics in the Stockton Ship Channel. I believe that the feasibility of actually producing such a model is low, given the inappropriate hydrodynamic model design and uncertainty of inputs.**
-Good	
XPoor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goals of this project are clearly stated at the very beginning of the proposal: to develop a forecasting tool (model) to predict low DO events in the ship channel. This would be a very useful tool in light of the current DO problems and rapidly approaching deadline for implementing remediation.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

The justification for such a model would be that it would be used to modify water management practices. For example, when the model predicts an imminent DO depression, some sort of alert would go out to managers of wastewater treatment plants, duck clubs, stormwater holding ponds, etc. and they would hold up discharges until the crisis is past.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The approach that the PIs would use to achieve the goals is very sketchy and unfocussed. Yes, we all know that oxygen demand is a function of temperature and that nitrification is an important component. Yes, we know that nutrients stimulate phytoplankton growth and that their transport and settling below the photic zone results in increased oxygen demand. And yes, we know that the geomorphological change from narrow, shallow river to broad, deep channel acts to decrease flow velocity, increase water residence time, and promote vertical stratification. What we do not know is the amount of organic matter (OM) loaded at each source and the relative bioavailability of this OM.

   Tasks are broken down as: A. Literature review, determination of model input requirements, and develop monitoring plan. B. Select and upgrade key monitoring sites for continuous measurement of turbidity, temperature, EC, pH, DO, and chlorophyll a. C. Develop and improve DSM-2 model to include multi-layered ship channel. D. Report weekly forecasts of DO in ship channel. E. Develop separate management strategies for sourcewater operations.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   Modeling component may be feasible but is not the approach I, or I expect others, would recommend. Potential for real time forecasting is there but I have little confidence that the model will do this on its first iteration. One of the problems I see is the use of a 2 dimensional hydrodynamic model to answer a 3 dimensional question. Adding layers to the model is not the same as having a real 3D model in place.

   Another weak point is the lack of understanding of sources of BOD from surrounding lands and watersheds. A model is only as good as its inputs. I do not think there is sufficient input data to produce realistic representation of DO dynamics of the ecosystem. I suggest that more effort be put into determining the sources, loading, and bioavailability of BOD before embarking on such a tenuous modeling exercise.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Performance measures are well outlined.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

If all goes as planned the proposed products will be met. However, my feasibility concerns (above) suggest that their expectations may be greater than the actuality.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The PIs are all highly qualified and have put together an impressive field and research team.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Much too expensive for the product. For example, most of the Task 1a could be done by having a one day meeting of the PIs.

Miscellaneous comments:

None

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **187**

Applicant Organization: **University of California, Berkeley**

Proposal Title: **Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XExcellent	**This seems to be a straightforward modeling and real-time monitoring project that will result in a product that is of value to decision-makers.**
-Good	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goal of this project is to develop a real-time model that would allow prediction of oxygen depletion in the Stockton Deep Water Ship Canal. This concept is both timely and important. Timely because of the improvements in and availability of real-time water monitoring instruments with remote access. Important because low DO in the ship canal can be a barrier to migrating salmon, and the proposal focuses the modeling efforts on the seasons when such a barrier would be most detrimental.

2. **<u>Justification.</u>** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project

justified?

The proposed model builds on existing models as well as information coming from another project that explores different aeration alternatives.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The approach appears appropriate for the problems being addressed. The model predictions and public accessibility of the model will make it very valuable to decision-makers.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   Seems very feasible. My only concern is how many monitoring stations will the $45,000/yr budgeted permit them to purchase. What sensors will be included (temperature, turbidity, conductivity, pH, DO, chlorophyll?) and how were those selected? What depths? The proposal is very vague about how monitoring stations will be selected and evaluated.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Two clear performance measures are identified -- ability of the model to forecast observed conditions and public acceptance of the model. Both of those are appropriate and adequate.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The model will clearly be a product of value and it seems a likely product of the research.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The applicants clearly have the modeling expertise and familiarity with the system to accomplish the proposed research.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Budget seems reasonable. I only wonder about the reasoning behind the amount budgeted for monitoring equipment. How did they decide how many were needed?

Miscellaneous comments:

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **187**

Applicant Organization: **University of California, Berkeley**

Proposal Title: **Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**The basis for the proposed research is sound and of critical importance to the CALFED Bay Delta Restoration Program. The researchers have excellent credentials and would certainly contribute to the knowledge base surrounding the DO deficit in the San Joaquin River, however "real-time forcasting" of the problem is much less certain. Further, extension to sustainable management seems unlikely from the present proposal. The cross referencing of previous grants and proposed grants begs for consolidation of research efforts by CALFED, and for this reason I must rate the present proposal as only GOOD.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The central goal of this proposal is to develop a forecasting tool to improve the management of episodes of low dissolved oxygen in the Stockton Deep Water Channel. Sensitive and effective forecasting tools are highly desirable to the CALFED Restoration Program (and to ecosystem managers throughout the world!). More specifically, the periodic dissolved oxygen defecit within the Stockton Deep Water Channel is a critical problem for the CALFED Restoration Program and is in need of immediate and sustained attention.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   The present proposal is certainly justified in terms of the well-documented problem of low DO within the lower San Joaquin River. A basic and well understood general conceptual model is presented.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The approach, as described, is vague in terms of meeting the proposal's central objective. The results will certainly add to the base of knowledge about the Sab Joaquin's DO deficit and it is likely to generate novel geral information. In theory, the approach would yield critical information for managers, but in reality the described approach is very ambitious and successful outcome is less than certain.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   I am not a hydrologic modeler, but I recognize the high degree of difficulty in the real-time model that is proposed. Research within the Delta has produced competing hydrologic models, so the combination of a hydrologic model coupled with biological/chemical reactive constituents in a watershed with extremely complex tidal and riverine interactions is clearly a major scientific challenge.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   see #4--- In general, the performance measures are not crystal-clear in terms of the project's ambitious central goal (see #1)

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The authors' track records suggest that thoughtful and thorough work will be generated and published. The specific products in terms of the CALFED Restoration Program are not certain. The stated goals are ambitious and if fully accomplished would be of great utility to the CALFED Project, but the proposal hinges on the integration of modelling effots that incorporate complex hydrologic, chemical loading, and biologic components.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Excellent track records and qualifications

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   The budget seems high in terms of model development. Much of the input information has been previously generated and the authors have prior experience with the hydrology and biogeochemical issues associated with the catchment.

Miscellaneous comments:

The present proposal aims to integrate a wealth of pre-existing research on the problem of DO deficits in the San Jaoquin River. Several additional previously funded and proposed proposal proposals are referenced. Review of a single proposal surrounding such a critical topic is difficult without being able to evaluate the entire scope of previous and proposed research. In my opinion, the CALFED Bay Delta Restoration Program should convene a special-topic specific panel to deal with this issue in terms of CALFED funded research.

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **187**

Applicant Organization: **University of California, Berkeley**

Proposal Title: **Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**Despite some problems with the proposal, noted above, I believe that the tools to be employed here are fundamentally sound, and could lead to improvement in water quality of the San Joaquin River Deep Water Ship Channel, as well as useful management strategies for other similar sites.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goals are fairly straightforward: to apply a variant of an existing DO model, as well as some sophisticated data acquisition, to the problem of forecasting DO and managing DO deficit in the Stockton Deepwater Ship Channel.

   I found the title of the proposal slightly confusing. Apparently, this aspect of the problem is "adaptive" only in the sense that the model will be modified as data are collected in order to better fit the observations. This is in contrast to 'real-time adaptive control' in which data are fed in 'real time' to a model which is used in turn to determine management decisions (e.g control aerators or other devices). In other words, it is not necessarily any more "adaptive" than any other modelling project with ongoing data collection.

In spite of this, this application of a model in concert with data collection is useful, and, if effective in developing management strategies for DO and removing the block to fish migration, timely.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   Monitoring and modelling of the channel is appropriate to consider how best to manage DO by oxygenation. The statement of the model in the proposal is incomplete, though it does refer to extensive literature by Chen et al.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   It is not clear that the emphasis of 'adaptive real time forecasting' is the most effective means of managing DO in the ship channel. It might make more sense to use the model to evaluate alternative management strategies under various loads, environmental conditions, etc, and to select the best strategy for the current conditions as observed by monitoring instruments, etc. If this is what the authors actually intend, it is not clear from the proposal. If plausible, effective strategies are developed, the infromation could be extremely useful to decision-makers.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   The details of the procedure, especially regarding 'adaptive real time forecasting' using the combination of data acquisition and modelling, is not well-documented in the proposal. The modelling is certainly feasible, and much of the model has already been developed by Chen and colleagues. Despite the lack of detail presented in the proposal, I would judge the project to be feasible in that 1) versions of the DO model already exist and have been tested elsewhere, and 2) the model should be adaptable to the physical situation specified and used to forecast DO.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   At least two types of performance could be reasonably considered: degree of success of prediction of DO conditions (forecasting) using the model, and improvement in DO conditions using management strategies developed as a result of the monitoring/modelling exercise; the proposal mentions the first of these under "5. Performance Measures" The proposal also mentions public acceptance of the model and participation of stakeholders as another measure of performance. None of these measures are quantified in detail.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

Assuming that the monitoring and modelling programs are carried out carefully and that the model is shown to adequately forecast DO in response to management options, the results and interpretations should have more general applicability.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   Based on their enclosed qualification statements, the project team is eminently qualified to perform the modelling. The necessary infrastructure and support is available to accomplish the project. The project apprears to be coordinated with other ongoing projects.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Yes.

Miscellaneous comments:

The balance of the proposal is uneven. Some sections of the proposal are poorly organized or inadequate, e.g. "theory" under the Justification is simply a statement of a temperature relationship to CBOD - this and the rest of Justification could have strongly benefited by a more detailed discussion of the various processes relevant to a model of DO in the water column e.g. diffusion, reaeration, stratification, parameterization of biological processes, etc. Even a brief discussion of such processes, with a figure or table would help to justify the use of Chen's model. Numerous typos exist in the proposal (it seems evident that the proposal was not spellchecked). A few references cited in the text are not provided in the reference list (e.g. Bowie et al, 1985; Lehman, 2001; USBR, 2001). On the other hand, several references that are in the reference list are not cited in the text. While these quibbles are arguably not relevant to the significance of the proposal, they are certainly annoying to the reviewer, and raise some question about the thoroughness of the authors.

Environmental Compliance:

Proposal Number: 187

Applicant Organization: University of California, Berkeley

Proposal Title: Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

   XYes **-**No

   If no, please explain:

   No permits or environmental documents required.

   However, if new monitoring stations will be installed, a 1600 Agreement may be necessary.

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

   XYes **-**No

   If no, please explain:

   No budget or timeline specified. If 1600 Agreement needed, allow approximately 2 months and $772.75 in fees.

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

   -Yes **X**No

   If yes, please explain:

Other Comments:

Budget:

Proposal Number: 187

Applicant Organization: University of California, Berkeley

Proposal Title: Adaptive Real-Time Forecasting and Sustainable Management of Dissolved Oxygen in the San Joaquin River and Stockton Deep Water Ship Channel

1. Does the proposal include a detailed budget for each year of requested support?

   XYes **-**No

   If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

   XYes **-**No

   If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

   XYes **-**No

   If no, please explain:

4. Are appropriate project management costs clearly identified?

   -Yes **X**No

   If no, please explain:

   No separate PM task. UCB supports this cost as a teaching/research university.

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

   XYes **-**No

   If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

   Federal funds.

6. Does the budget justification adequately explain major expenses?

   XYes **-**No

If no, please explain:

7. Are there other budget issues that warrant consideration?

   -Yes **X**No

   If yes, please explain:

Other Comments: