Proposal Reviews

#175: Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis

Tri-Dam Project

Final Selection Panel Review	
Initial Selection Panel Review	
Research and Restoration Technical Panel Review	
San Joaquin Regional Review	
External Scientific Review	#1 #2 #3 #4 #5
Environmental Compliance	
Budget	

Final Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Final Selection Panel Review

Proposal Number: 175

Applicant Organization: Tri-Dam Project

Proposal Title: Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis

Please provide an overall evaluation rating.

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

Amount: **$661902**

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

None

Provide a brief explanation of your rating:

This project is primarily to extend an existing model downstream and to continue to improve it for the upstream portion of the Stanislaus. Its initial reviews concluded that it could be a very useful project, but also raised several issues that needed to be addressed before funds were awarded. The Selection Panel had recommended funding when all criticisms were addressed.

The proposal's authors' comment letter points out that these issues had been investigated and resolved in the current proposal or in prior project phases that were documented in the proposal.

The Panel finds that the proposal did explain that there was an extensive procedure for model development in phase one, as documented in the proposal's references, which was one criticism of the panel's initial review. This prior effort also developed eleven scenarios for testing, another criticism of the review. The authors pointed out in response to comments that an expert panel was designed to be used in the project's first six months. The comment letter demonstrated that all issues raised by initial reviews were already presented in the proposal.

Consequently, this project should be funded as is, based on the current proposal.

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 175

Applicant Organization: Tri-Dam Project

Proposal Title: Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis

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	**X**
Not Recommended	**-**

Amount: **$661,902.00**

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

none

Provide a brief explanation of your rating:

The Technical Panel rated this proposal above average because, in part, of the need to improve temperature models to help guide dam operations for downstream benefits for fish species of concern. The team is qualified and the proposal is well organized with clearly stated goals and objectives. Some concerns that need to be addressed if the proposal is revised include (1) better development of background and review of water temperature literature and expansion of our knowledge of existing models and their efficacy, (2) use, early in the project (not Task 7), of a task force of experts to evaluate and develop guidance on importance of temperature regimes and temperature models to fish and fish management and their application, and (3) development and evaluation of potential scenarios of dam operations that could achieve possible changes in downstream water temperatures. This Selection Panel recommends this proposal be revised and resubmitted as a directed action.

Research and Restoration Technical Panel Review:

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

Proposal Number: 175

Applicant Organization: Tri-Dam Project

Proposal Title: Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis

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 proposal was rated above average on the basis of the temperature model, which is expected to be of value to water managers. The lack of attention to measures on the fish response, such as growth was the main concern of the panel.**
XAbove average	
-Adequate	
-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 proposal is well organized with clearly stated goals and hypotheses. The goal is to develop effective solutions for water temperature improvement on the Stanislaus River and lower San Joaquin rivers. Solutions will be explored by first extending the existing HEC-5 temperature model of the system to downstream reaches. The hypothesis is that river temperatures can be effectively altered by operations and or structural modifications in New Melones and Tulloch Reservoirs, and Goodwin Pool. Finding management schemes that coordinate weather patterns and availability of cool reservoir water may be valuable for efficiently using water for flow augmentation and temperature control. In particular, the allocation of cool water between spring and summer juveniles and spawning adults in autumn is a difficult task and a calibrated model that takes into account weather patterns may make the resource management more efficient. Therefore the concept is important.

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?

   Since the team has considerable experience with temperature modeling and because the physics of heat transfer is predictable this part of the model is feasible. Establishing temperature criteria for fisheries is weak. Performance measures have not been established for the new model. No performance measures were identified in terms of fish dynamics, such as fish growth or survival. The proposers have demonstrated their abilities on previous phases of this work.

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 project should produce a first rate model of historical temperature patterns, which should be useful for exploring temperature control strategies and developing implementation plans. Missing are measures of how the alternative operation scenarios will affect fish growth, mortality and spawning timing.

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

   The three year budget of $662,000 is sufficient to complete the project; but the distribution could be reallocated to strengthen the task of developing temperature criteria for fish. Data collection is the major part of the project and it appears the project would take over the support of the temperature and climate monitoring for the three year period.

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?

   The regional review ranked this proposal high priority and concluded it will provide water managers information to maintain suitable river temperatures.

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?

   No administration issues were identified.

Miscellaneous comments:

The temperature model development is first rate and sufficient funds are identified for feasibility studies and model development. Development of temperature criteria is weak and it is unclear that the project will adequately address the impact of system operations on fish. In particular, fish are migratory and only resident at particular times. The operation management must take this into account. The panel recommends allocating more effort to the fish issues. For example, the modeled temperature distributions in the river could be input to a standard fish growth model to characterize the effect of one operation plan on fish growth relative to another plans effect on fish growth. In this way the two plans could be judged according to the ratio of fish growths.

San Joaquin Regional Review:

Proposal Number: 175

Applicant Organization: Tri-Dam Project

Proposal Title: Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis

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

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

The committee reviewed this proposal and ranked it as a high priority for the San Joaquin region. The temperature modeling for the Stanislaus and lower San Joaquin river will provide very valuable information to water managers for alternative methods to maintain instream water temperatures.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   Model is basically finished due to prior funding. Proposal asks for continued funding for further refining to include data from extra river water temperature monitoring and meteorological monitoring sites and to model from the confluence of the Stanislaus River with the San Joaquin River downstream to Mossdale.

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

   XYes **-**No

   How?

   Addresses strategic goals #1 and #2 (at-risk species, ecological processes) San Joaquin region #6 (effects of managed flow fluctuations) and several goals of the ERPP zone vision statement (improving water temperatures, providing summer and early fall base flows, and storing sufficient cool water in the reservoirs during droughts).

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?

   Will augment current restoration projects by giving alternatives to water management protocols for temperature in the Stanislaus for optimal/ survivable water temperatures, establishing water temperature targets for other San Joaquin basin waters, and removing temperature as a limiting factor for restoration projects.

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

   XYes **-**No

   How?

   Large stakeholder and phase 1 funding groups (state agencies and Irrigation Districts), Trout Unlimited, Stanislaus River Stakeholders, and South Delta Water Agency are also involved with the project's goals.

Other Comments:

Project has the potential for indicating alternative flow operations that would be beneficial for salmonids and other native fish in the Stanislaus basin and that these operations could then be implemented on other watersheds to manage water temperatures downstream from the dams.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **175**

Applicant Organization: **Tri-Dam Project**

Proposal Title: **Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis**

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):

no

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	**Good rating for what is proposed. I would rate it excellent if fish has been integrated into the work and a justification for the extensive model refinement were made**
XGood	
-Poor	

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

   The goal is to develop effective solutions for water temperature improvement on the Stanislaus River and lower San Joaquin rivers. Solutions will be explored by first improving the existing HEC-5 temperature model of the system. The hypothesis is that river temperatures can be effectively altered by operations and or structural modifications in New Melones, Tulloch Reservoirs and Goodwin Pool. Finding management schemes that coordinate weather patterns and availability of cool reservoir water may be valuable for efficiently using water for flow augmentation and temperature control. In particular, the allocation of cool waters between spring and summer juveniles and spawning adults in autumn is a difficult task and a calibrated model that takes into account weather patterns may make the resource management more efficient. Therefore the concept is important.

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?

   Evaluating how operations, structural and restoration changes affect temperature is valuable and important. The proposed work is an extension of current temperature modeling and monitoring, however the proposal does not really explain what is the current state of the model, exactly what will be added to the new model, or why additional work is needed to extend the model downstream. The major efforts would be upstream in the reservoirs, which presumably are in the existing model and are calibrated. The proposal mainly addresses the issues of temperature and largely ignores co-occurrence of fish and lethal temperatures. The temperature duration table for chinook does factor in information when fish are in the river system. It seems optimal operations cannot be defined unless some attention is paid to controlling the system temperature according to the presence and distribution of fish. The extended temperature model would be first rate, but it is not clear that this is where the effort should be placed. This is a research and pilot project, which is the proper level of effort.

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 temperature modeling approach is excellent. The listing of tasks including 1) extend the model 2) recalibrate the model 3) reservoir operation studies involving reservoir flow and elevation operations, intake elevation modification, and a new constructed pipe to bypass Goodwin Pool, 4) perform feasibility of alternatives, 5) develop implementation plan, 6) collect and manage data, 7) Develop temperature criteria with a review panel.

   Missing for the proposal is an explicit goal to predict in-season temperature patterns from climate predictions and the reservoir status.

   The physical tasks in the proposal are well designed. However, the interpretation of the temperature information in terms of the fish in task 7 is weak. Will the temporal distribution of fish species by life history stage be modeled? Will growth and mortality be related to temperature? These questions are missing from the work plan.

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?

   Since the team has considerable experience with temperature modeling and because the physics of heat transfer is predictable this part of the model is feasible. Establishing temperature criteria for fisheries is undefined and will not be developed with the rigor of the temperature modeling.

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 will be in terms of maximum error of the calibration exceedence criteria for temperature. However, the details are lacking.

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 project should produce a first rate model of historical temperature patterns, which should be useful for exploring temperature control strategies and developing implementation plans. Missing are measures of how the plans might affect fish growth, mortality and spawning timing.

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 team is highly qualified and has the infrastructure to develop the temperature model. They experience with the response of fish to temperature appears limited

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

   The three year budget of $662,000 is sufficient to complete the project; but the distribution could be reallocated to strengthen the weaknesses in the project. The smallest percentage, 7.7%, is to develop the temperature criteria. I believe this amount should be equal to the feasibility studies. Data collection is the major part of the project and it appears the project would take over the support of the temperature and climate monitoring for the three year period. If these are to be ongoing activities, is it reasonable for these costs to be in a planning grant?

   extend model $51,250 7.7% refine model with data $80,750 12.2% operational studies $108,700 16.4% feasibility study $125,550 19.0% develop plan $55,950 8.5% collect data $190,102 28.7% develop temp criteria $49,600 7.5% total $661,90 100%

Miscellaneous comments:

The temperature model development is first rate and sufficient funds are identified for feasibility studies and plan development. Development of temperature criteria is weak and it is unclear that the plan will adequately address the impact to fish if the link between system operations and fish is weak. In particular, fish are migratory and only resident at particular times. The operations plans must take this into account. There is no mention of this problem nor and effort to characterize fish factors and relate them to climate and river operations. Perhaps the temperature work should be scaled back and the attention to fish increased? Perhaps the existing model for the upper river is sufficient to develop the plans and assess impacts of fish.

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **175**

Applicant Organization: **Tri-Dam Project**

Proposal Title: **Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis**

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	**Excellent -** **Overall a needed project, especially the operational scenarios and "what-if" type modeling approach necessary for managers to make competent decisions.** **However I am left with the impression that some of the research and data-collection machinery is already in place that already lead toward the goals of the stakeholders and is not really new for this proposal. What would happen if this project went un-funded?** **A more detailed description of the fate of the data from this project needs to be made explicit. A site like Streamnet or DART would be ideal.**
-Good	
-Poor	

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

   Yes the goals are clearly stated and internally consistent. The concept is timely and important.

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?

   This is a natural extension of existing work as described by various stakeholders identified in the proposal.

   Many of the pieces seem to be in place and extension of the model and data proposed should be very straightforward or else the magnitude of the proposed work is highly understated. This is mostly a parameterization and calibration issue rather original work.

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 work entailed should meet the objectives of the project. Results will certainly add to the base of knowledge if they are well distributed and presented carefully. Novel information, methods and approaches are unlikely because this is primarily an analysis and data collection study.

   The information will be certainly be useful to managers.

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?

   In fact all of the pieces are in place: the data collection, model and experienced personnel. The physical extent of the model encompasses the managed portion of the river.

   Success is likely. Scale is appropriate

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?

   This is unclear in the proposal: are these performance measures (PM) for project accomplishments or for the resource being managed? I think the reviewers want the first and the proposal writers mean the second.

   There is an opportunity here for funders to specify how the project will be deemed acceptable or not (for the first PM type) since it is not specified in the proposal. The proposal writers acknowledge that performance of the model can be assessed with many possible measure and funders would do well to lay this out carefully.

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?

   Tools are the current generation of modeling products. A static report is no longer sufficient and the proposal writers realize this. the extent that these can be used after the project is completed will be a good measure of their utility and value of the project overall.

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?

   Seem well qualifed, using tools and data with which they are already familiar.

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

   The natural extension of existing projects makes me curious the extent to which the extra consultants are necessary. Given that much data collection and analysis is in place already, it is not clear what of the outcomes and products will be a direct result of additional funding or would be expected anyway. E.g., Task 7 is supposed to "Develop water temperature criteria" but in the details promises to be a summary of a panels evaluation of CDFG's (existing?) criteria.

   Making results and data available will require some cost especially as this must be carried forward into the future, beyond the extent of this project. Will this require additional funds or not?

Miscellaneous comments:

There is no specific plan for making the data and results public other than stating that they "will be available to interested parties". It needs to be clarified. The internet is a natural venue for such information, but requires some maintainance. I appreciate the maps etc. in the proposal but graphics were very difficult to interpret in the proposal.

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **175**

Applicant Organization: **Tri-Dam Project**

Proposal Title: **Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis**

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 proposal was very well laid out, the researchers are competent, the approach is good. The project would greatly benefit from strengthening the fish population/physiology component.**
XGood	
-Poor	

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

   The proposal is exceptionally well organized. The goals, objectives, and hypotheses are clearly stated. The hypothesis that temperature is a potentially limiting factor for steelhead and chinook in the target rivers is justified and supported, thus the work is timely and important.

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 scale of the work is justified. My only major criticism is that the focus is almost completely on the prediction of water temperature. The greatest uncertainty lies in the response of fish populations to temperatures, yet this is a very minor component of the proposal and inadequately addressed through solicitation of expert opinion. The conceptual model regarding the response of fish populations to water temperatures is very incomplete. For example, do the modelers consider that the presence of thermal refuges (e.g. groundwater inflows) that fish could use to improve their survival rates when river temperatures (as an average) are high? Such dynamics might modify the spatial requirements of the physical model.

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 is very well designed for meeting the physical modeling objectives, predicting water temperature over time and space. The approach for improving the means of predicting fish population response to temperature changes is very weak. Convening a panel of experts will provide little new information in my opinion. What is required is experiments where fish are exposed to alternate temperature regimes in a natural setting (large enclosures) under different biological conditions (e.g. with/without predators, variable food supplies). Another alternative is to evaluate fish stress levels at different temperatures using RNA/DNA ratios or other physiological techniques. Fish could be sampled in different sections of the river with different temperature regimes, to strengthen the hypothesis that warmer temperatures decrease survival rates (and at what time of year, life stage, etc.). This project could clearly benefit from the physical modelers and engineers interacting with a biologist who is capable of performing this type of work.

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 physical modeling and monitoring approach is very well documented and technically feasible. The likelihood of success for improving the spatial extent of water temperature predictions, and the accuracy of predictions is high. The likelihood of success of improving the inferences of temperature improvements, in terms of their effects on fish, is very low, given the limited treatment of this topic in the project.

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?

   Yes, with the exception of fish related measures.

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?

   There will be many valuable products from this exercise. If costs of mitigation measures are high, managers will likely ask what the proposed changes mean to fish populations. Inferences based on predicted temperatures will be weak because of the limited/non-existent effort on this topic in the proposed work.

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 project team seems appears very capable and has already demonstrated their abilities on previous phases of this work.

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

   I found the overall budget high, especially considering there is no biological work being conducted. Much effort (and expensive talent + $1,000 day) is being exerted on the temperature side - few/no resources are being targeted at the largest uncertainty (the fish response).

Miscellaneous comments:

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **175**

Applicant Organization: **Tri-Dam Project**

Proposal Title: **Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis**

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):

I have a brother who is on the Board of South San Joaquin ID, one of the stakeholders mentioned in the application. I do not know if he is even aware of this proposal. I have no connection with the proposal writers or Tri-Dam.

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**
XExcellent	**As I read the proposal, this is an excellent well thought out program building on past experience and knowledge on the Stanislaus River system. I would expect it to produce usable results.**
-Good	
-Poor	

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

   The writers obviously have some experience in river temperature modeling and the need for good meteorological data as well. They will be building on an initial crude look at the river system. The five goals on pages 2 and 3 seem well stated and are a logical progression. In view of the importance of temperature to salmon restoration, better tools to assess the effect of operational changes are very 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?

The desire to restore good salmon and trout habitat warrants a careful analysis of the role of temperature regimes in the river and reservoir system under a variety of weather conditions. Once verified, modeling can reveal much about possible operational schemes and risks under the widely varying hydrology characteristic of California rivers.

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 seven task approach laid out on page 4 seems very logical and systematic, designed to add knowledge of river temperature behavior with each step. Eventually the information could provide useful insights into potential modification of reservoir operations (and some possible structural changes) to improve cold water fish habitat.

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?

   Given the writers' past experience on the Stanislaus River, the proposed project is quite feasible and likely to be successful. Since it proceeds in steps there are opportunities to review and verify whether good results are being obtained during the course of the contract. The lower San Joaquin River reach may be the most difficult to influence from Stanislaus system reservoirs.

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?

   Again the step by step task approach should offer several opportunities to verify progress and evaluate results by reach and by task. It seems like a well thought out proposal.

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 project effort provides fairly intense monitoring along the Stanislaus River and lower San Joaquin River from near Vernalis to Mossdale and in the reservoirs. This data itself should lead to much better temperature modeling here and be helpful to other modelers on other streams. Of course, the stated primary purpose- that of evaluating management alternatives on the Stanislaus River system- could prove of great value to fishery restoration and enhancement.

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?

   I don't have any basis to judge the applicants, since I don't know them directly. The fact that they have the support of 6 stakeholders (2 federal, 1 State, and 3 local partners) speaks well for them.

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

   Yes, I think it is, especially in view of the large amount of effort laid out in the proposal. I note that they have already gotten commitments of $75,000 in federal funding and $ 85,000 in local funding.

Miscellaneous comments:

I recommend an additional model run or two at elevated air temperatures of perhaps 1 or 2 degrees C to partially simulate how far downstream suitable cold water fishery habitat can be maintained if some global warming occurs over the next 50 years or so.

External Scientific: #5

Research and Restoration External Scientific Review Form

Proposal Number: **175**

Applicant Organization: **Tri-Dam Project**

Proposal Title: **Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis**

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	**The proposal is well written, logically organized and, since it is an extension of an existing and tested simulation temperature model, is doable. It is somewhat short on detail, but conceptually is good. It would not likely provide novel information or approach, but outcome would be useful in improving habitat for fall chinook salmon and steelhead by improving water temperatue conditions in this important river system (assuming recommendations were implemented). The project personnel are well qualified. Cost seems high.**
XGood	
-Poor	

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

   The goals, objectives and hypotheses are clear and internally consistent. Extending the temperature model downstream to include the portion of the San Joaquin River between the confluence of the Stanislaus River and Mossdale Bridge would be valuable in recommending alternative water management to improve water temperature conditions for fall chinook and steelhead.

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?

   Yes, the study is justified relative to existing knowledge. Thermal loading in reservoirs and rivers has been successfully modeled for some time and the existing model on the Stanislaus River (based on examples provided) provided realistic predictions. Extension of the model downstream would be valuable. The conceptual model is clearly stated and the proposed extension of the existing model is justified.

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 is well designed and appropriate for meeting the objectives of the study. Knowledge gained will be primarily limited to the Stanislaus-San Joaquin River system. The project is a refinement and extension of an existing model and would not likely generate novel information, methodology or approaches. However, the information would be very valuable to decision-makers in terms of evaluating operational and structural alternatives.

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 general approach is documented but few details are provided. The study is clearly technically feasible. With the previous experience with model development the likelihood of success in refining and extending the model is good. The scale of the project is consistent with the objectives.

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?

   The researchers provide evidence that the existing simulation model does an acceptable job in predicting daily mean, maximum, and minimum water temperature at selected locations. In this study they plan to improve model calibration, as well as extend the model downstream. Performance measures apparently have not been developed. They state, "Performance measures will be developed with the support of stakeholders and may include maximum error, exceedance criteria, seasonal considerations, as well as others".

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?

   Yes, products of this effort will be of value to water management of the Stanislaus reservoir-river system and the lower San Joaquin River. A final project report including relevant results will be provided. In addition, quarterly reports will be useful in documentating progress. I would think clear data presentation would be very adaptable to interpretative outcomes.

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?

   I believe the project team is highly qualified. Team members have had extensive experience with simulation temperature modeling. Since this is an extension of previous work the infrastructure to support the study is available.

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

   Costs proposed for CDF&G seem quite reasonable. I have not worked with consultants and am probably not qualified to judge this. To me, hourly wages seem excessive. For example in year 1 a total of 1460 hrs (they say 1640 under services or consultants) is budgeted at $188,600 for 36.5 weeks, or about $129 an hour. As I interpret this, these dollars are spread across 4 consultants, each working about 9 weeks (assuming equal effort). Effort seems appropriate but cost high.

Miscellaneous comments:

In general I believe the project is well conceived and will provide managers with the type of information needed to make operational or design decisions.

Environmental Compliance:

Proposal Number: 175

Applicant Organization: Tri-Dam Project

Proposal Title: Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis

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

   XYes **-**No

   If no, please explain:

   No permits 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:

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: 175

Applicant Organization: Tri-Dam Project

Proposal Title: Stanislaus - Lower San Joaquin River Water Temperature Modeling and Analysis

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?

   -Yes **X**No

   If no, please explain:

   all the detailed information is provided in the budget summary and/or budget justification.

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

   -Yes **X**No

   If no, please explain:

   Again, stated in the budget summary and/or budget justification

4. Are appropriate project management costs clearly identified?

   -Yes **X**No

   If no, please explain:

   indicates who and if there are no costs, but cost are identified in the budget summary.

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).

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: