Proposal Reviews

#154: Shallow open water habitats: Hydrodynamics and benthic grazing

Stanford University

Initial Selection Panel Review	
Research and Restoration Technical Panel Review	
Bay Regional Review	
Delta Regional Review	
External Scientific Review	#1 #2 #3 #4 #5
Prior Performance/Next Phase Funding	#1 #2
Environmental Compliance	
Budget	

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 154

Applicant Organization: Stanford University

Proposal Title: Shallow open water habitats: Hydrodynamics and benthic grazing

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

Amount: **$471,661**

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

None

Provide a brief explanation of your rating:

This proposal provides important information regarding shallow water hydrodynamics that can improve modeling of the Delta and thus be of great value to many aspects of the CALFED program beyond ERP. Its contributions to understanding of hydrodynamics (the fundamental driver of ecosystem processes in the tidal part of the system) will be widely beneficial. Emphasis on food web implications of boundary layer dynamics is also important for planning restoration projects. This team has the skills to link the developments they make directly into models of Delta hydrodynamics. This project can produce really important information, the cost is reasonable, and the likelihood of success is high. As the work develops, the proposers need to do a better job at showing how their project addresses critical uncertainties in the current conceptual models concerning intertidal and shallow subtidal habitat restoration (and thus cast their work more directly in the CALFED adaptive management framework).

Research and Restoration Technical Panel Review:

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

Proposal Number: 154

Applicant Organization: Stanford University

Proposal Title: Shallow open water habitats: Hydrodynamics and benthic grazing

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XSuperior	**This proposal is of excellent scientific merit, and, in the view of the technical panel, will provide important research to provide the rationale for restoration goals. The team on this project is probably one of the most capable group of scientists that can be brought together to work on this problem.**
-Above average	
-Adequate	
-Not recommended	

1. **<u>Goals and Justification.</u>** 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 PIs provide a clear statement of goals, and the project is justified on the basis of its scientific merit.

2. **<u>Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).</u>** 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?

   This is certainly a capable team who, in general, will have little trouble with effectively implementing their research plan. One concern is the applicability of site-specific methods to large-scale ecosystem processes. The panel agreed that the complex field measurements involved could not feasibly be expanded to more than the two study sites within budget limitations. However, the panel notes that the applicants are using two very representative

sites: One in the large flooded delta island (Franks tract) and one in a natural embayment (Grizzly Bay) that facilitate scaling. The performance measures are adequate for this project.

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 proposal will advance the state of scientific knowledge with respect to understanding how tides and wind-dominated waves determine the hydrodynamics of shallow estuarine waters. This project is mostly research, but does have very strong ties to the restoration efforts. These include (1) field data being collected in a re-flooded island, one of the predominant restoration strategies being considered by CALFED, and (2) specific attention to the role of non-native bivalves in dominating the shallow water benthos, especially in restoration sites.

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

   The budget is reasonable.

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 proposal was ranked "Medium" by both the Delta and Bay regional reviews.

   The Delta review was concerned that weather conditions would seriously hamper field work at D-7, and suggested that the interactions with scientists studying closely related components of the ecosystem should be stronger. The Bay panel noted that the feasibility of the biological study depended on having sufficient number of benthic grazers at D-7.

   The Bay regional panel was concerned with the lack of a strong connection to restoration goals. However, the technical panel believes this project has significant benefits for CALFED restoration goals. See Section 3 for more details.

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?

   Budget summary is $471,661, and 17A is $616,605. No cost-share funds are identified. Sampling aquatic invertebrates will need a scientific collecting permit.

Miscellaneous comments:

None.

Bay Regional Review:

Proposal Number: 154

Applicant Organization: Stanford University

Proposal Title: Shallow open water habitats: Hydrodynamics and benthic grazing

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

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

Though this is an interesting study, the panel did not think it rated high for the ERP in the Bay region. There were several reasons, 1) feasibility was unclear (see below) and 2) lack of strong connection to Bay area restoration goals. One of the main premises of the proposal is to increase our understanding of shallow water habitats for themselves and as the basis for a better understanding of fish dynamics; however, the panel did not believe that the sites being evaluated are that important to this question as a whole. The group favored research that more directly affected our implementation of wetland/riparian restoration projects or those more directly related to fisheries in the Suisun and the Bay. Also, only one of the sites was in the Bay region; the other site was in the Delta.

1. Is the project feasible based on local constraints?

   -Yes **X**No

   How?

   It is not clear that this proposal is feasible. The researchers have experience and knowledge of these areas; however, the researchers themselves note that the biological aspect of the study depend on having sufficient number of benthic grazers at one site (D7 Grizzly) and obtaining permission to use Dolphin from the Coast Guard. In addition, some members of our panel questioned the feasiblity of performing this research in Franks Tract due to high winds.

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

   XYes **-**No

   How?

   It relates to the general goals BR-6 at risk species, specifically to our understanding of primary and secondary productivity within Suisun Bay and food webs in Grizzly Bay. However, the research is not directly critical to the implementation of wetland restoration projects and associated shallow water in these areas as it is currently designed.

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

   -Yes **X**No

How?

It links to other research projects, but not that well with wetland restoration efforts, which are the emphasis in the bay region. Understanding Grizzly Bay processes is probably not as important as developing a more in depth understanding of the shallow water processes in the sloughs and channels of wetlands. Grizzly Bay and Franks Tract are fairly deep areas of open water by comparison to wetland sloughs and channels.

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

XYes **-**No

How?

Yes, other local researchers are involved. Bay region USGS researchers in particular.

Other Comments:

no other comments

Delta Regional Review:

Proposal Number: 154

Proposal Title: Shallow open water habitats: Hydrodynamics and benthic grazing

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

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

An adequate proposal, but not a priority.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   Conditional yes. Proposal is based on historically developed data and rationale. Weather conditions (wind) may seriously hamper field-sampling procedure at D7. There is good potential for high turbidity in the test area can foul instrumentation with sediment. Egeria fouling and associated chemical control will affect primary productivity measurements.

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

   -Yes **X**No

   How?

   No direct link to a specific 2001 restoration priority.

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

   -Yes **X**No

   How?

   The rationale is based on previous work done in the Delta and historic IEP ties in personnel, previous studies and current thinking about primary production relative to light penetration in the water column are in place and should be actively maintained. However, interaction with personnel dealing with other closely related components of the ecosystem such as primary productivity studies and X-2 mechanisms should be increased.

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

   -Yes **X**No

How?

See #3

Other Comments:

Needs coordination with Phytoplankton monitoring plan proposal

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **154**

Applicant Organization: **Stanford University**

Proposal Title: **Shallow open water habitats: Hydrodynamics and benthic grazing**

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 project is very relevant and the goals are quite achievable. There is an experienced, highly competent team that has great resources and a very reasonable budget.**
-Good	
-Poor	

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

   There is probably not a more relevant proposal that this one given todays emphasis on maintaining healthy productive ecosystems. The melding of physical observations and modeling to understand the physical processes at work in shallow water is most exciting. Coupling data and models is probably the only way to get at the underlying physics. With this new knowledge, we can then work to understand how biological processes operate in potentially productive waters. At present, there is a great need to evaluate how various restorative activities may impact a shallow water habitat and only through studies like those proposed here can that occur.

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 existing knowledge base is populated with descriptive discussions of how the ecosystem operates. Building on that firm foundation of previous work, the time is perfect for taking the next step. The research plan proposed here has a very specific endpoint at its core. On the other hand, the conceptual model is quite general as presented but the research plan will help develop it.

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 field procedures and modeling proposed for this study are both well tested and extensively used methodologies. The former has led to several key findings in previous studies involving estuarine processes. The model has been used without any apparent problems. The project should provide water resource managers with defensible options for improving/maintaining an ecosystem. They will have new tools through this effort to make informed decisions

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 investigators have carefully laid out a good plan and are almost certain to accomplish the objectives they proposed. They have also coordinated it with the relevant parties. The only issue will be if they cannot get permission to work in the area of interest. They have enough insight and experience to avoid nature acting to somehow not provide the relevant background biological system.

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 results of this project will be communicated through public forums conference/meeting presentations, Ph.D. theses, and ultimately peer-reviewed publications. The degree of success of the project will clearly be apparent to CALFED should these communications not materialize.

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 products envisioned by this effort will help to advance what we know about the impacts of physical dynamics on benthic grazing. They will permit estuarine managers (and scientists) to finally have a means to relate the effects of grazers on the food web. The entire community working on habit restoration will benefit from this effort.

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?

Professor Stephen Monismith is one of the countrys most respected investigators. He is known for addressing and solving the most challenging problems of our time. Here he brings together two very smart co-investigators, Professor J. Koseff and Dr. Janet Thompson. Prof. Koseff, an eminent scientist in his own right, will provide key insights and guidance. Dr. Thompson is less accomplished but clearly equipped intellectually to make great strides in meeting the objectives of the proposal. The physical resources available to these project team members are excellent.

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

   The budget is well throughout and quite reasonable for completing the proposed tasks on time. A big benefit is that the investigators have involved an outside expert, Dr. A. Genin, without the need to cover the labor involved. Only a small amount of travel funds are requested for Dr. Genin.

Miscellaneous comments:

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **154**

Applicant Organization: **Stanford University**

Proposal Title: **Shallow open water habitats: Hydrodynamics and benthic grazing**

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	**This is a really ambitious proposal which tries to kill two birds with one stone. I believe that the authors would have more success if they took separate aim on the main questions. Generating hydrodynamics at two shallow sites is probably not enough for parameterizing a large scale model. The second question of physical effects on benthic grazing is well addressed.**
XGood	
-Poor	

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

   Goals of the project are well defined: to assess the physics of shallow waters (current structure and turbulence) and how this might affect benthic grazing activity.

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?

This is a well justified proposal as it addresses topics directly germane to CALFED restoration activities.

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?

   At first glance the approach seems to be one of massive technological overkill. The amount of instrumentation and data gathering is large. There are two questions being asked: what are the physics of these areas and how does this affect benthic grazing rates.

   Ultimately, this information will be incorporated into simulation models of the bays. I am not familiar with the TRIM3D model but I assume it can be used to model circulation and advective transport. The physical data will provide the model with much needed information for the shallow areas and may vastly improve current predictions in these boundary areas. This being said, the experimental design of using only two sites is lacking in applicability to all shallow areas. Missing from the proposal is the importance of bottom texture/roughness to the hydrodynamics.

   The second question of how benthic grazing is affected by physical process is very well designed.

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 experiments are feasible, given the constraints mentioned in the proposal are resolved. All field work relies to varying extents on environmental conditions. That said, I think it important that benthic grazing experiments be conducted over a range of animal densities and activities. Restricting trips to times when animals a re most dense makes sense for the experimenter but decreases the applicability of the data for annual estimates of ecosystem function.

   Another concern with this proposal has to do with the applicability of this site-specific data to large scale ecosystem processes. I am not a physical oceanographer or hydrodynamic modeler, but I know that one of the more important parameters in shallow water hydrodynamics is bottom roughness. Extrapolation of bottom roughness from two sites up to system level is probably not advisable.

   Characterizing bivalve patchiness using bottom texture from REMUS side scan sonar may not be achievable, but even if it is, no ground-truth methods relating roughness to bivalve density are mentioned.

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 should be better defined. Saying only that this is research and will be reported in the literature is not enough. However, none of the other scientific proposals I read had much to say about this topic.

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 products mentioned are consistent with the GOALS above. I am sure that the data will be usable for modeling purposes (but see concern in APPROACH).

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?

   Costs seem high for 26 days of field work per year, however, the amount of post-processing of all the data from this instrument-intensive work helps to justify the budget.

Miscellaneous comments:

None

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **154**

Applicant Organization: **Stanford University**

Proposal Title: **Shallow open water habitats: Hydrodynamics and benthic grazing**

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	**This is a valuable research problem, and the PI's have done a nice job of showing how their research builds upon the existing body of knowledge. However, information is lacking on how the PI's propose to link the research on physical processes and the research on primary production.**
XGood	
-Poor	

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

   The objectives of this project are clearly stated - the PIs (verbatim from the proposal) "propose to develop, via field observation and modeling, a detailed view of how tides and wind-dominated waves determine the physical structure and hydrodynamics of shallow esturine waters, and how these physical processes can act to constrain net primary production through their effects on grazing and light." The proposal has moderate-to-strong links with CALFED priorities.

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 PIs do provide an extensive review of existing work, some of which is their own, and clearly demonstrate how their proposed study will build upon this body of knowledge. In terms of scientific merit alone, full-scale implementation of the project appears to be 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?

   It appears the research on phytoplankton dynamics and hydrodynamic processes is poorly connected. I can see how the reserach on hydrodynamic processes will provide the "detailed view of how tides and wind-dominated waves determine the physical structure and hydrodynamics of shallow esturine waters," but it is unclear to me how the PI's plan to assess "how these physical processes can act to constrain net primary production." It almost seems as if the sections on phytoplankton dynamics and hydrodynamic processes were written by two different people, and they have spent little time identifying the connections between these research thrusts. These connections need to be clarified for me to evaluate the potential success of the project. I'm not an expert in this field, so I could easily be missing something. This proposal is mostly a research effort, and will probably not have immediate benefits for 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?

   See above. It is difficult to evaluate the success of this project without a clearer description of the methods used to determine how physical processes can act to constrain net primary production.

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 perfomance of this project will mostly me measured in terms of information output (theses, peer-reviewed articles). This is appropriate for a research effort.

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 products of this research will be valuable in terms of their scientific merit. Their use for decision-making is not clear.

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 PI's have a good track-record, and appear to be capable of implementing the proposed project. I would still like more information on how they propose to assess the effects of physical processes on net primary production.

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

   The budget appears to be reasonable.

Miscellaneous comments:

None

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **154**

Applicant Organization: **Stanford University**

Proposal Title: **Shallow open water habitats: Hydrodynamics and benthic grazing**

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):

Stephen Monismith was my PhD advisor. I have authored papers with him and collaborated with him on research. I work in the same agency (USGS) as Jan Thompson although we work in different Divisions. Jan and I were in the same graduate program at Stanford. Jeffrey Koseff was on my dessertation committee and I took several classes with him.

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	**This is an interesting research proposal on an important topic. The proposed research addresses important questions both about the hydrodynamics of shallows and about factors controlling benthic grazing. The project team is well qualified to do the research. The interdisciplinary nature of the research questions and the research team is a real strength, contributing to the originality of the proposed research and the likelihood of success.**
-Good	
-Poor	

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

   This project proposes to study the influence of the hydrodynamics of shallow waters on benthic grazing of phytoplankton, by studying the response of the concentration boundary layer to variations in turbulent mixing and suspended sediment concentration. The goals and objectives are clearly stated and internally consistent. A number of research questions are posed; they could be more tightly linked. Understanding the mechanisms of phytoplankton depletion is very important to understanding the ecosystem of the estuary

and to the CALFED goal of increasing shallow water habitat.

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 project proponents do a good job of explaining the existing state of knowledge of the influence of invasive benthic grazers on phytoplankton dynamics in northern San Francisco Bay, and of identifying the gaps in that knowledge. The proposed study aims to address some of those gaps. The proposal does not include an explicit conceptual model, but it does make clear how the proposed work will advance our understanding of the mechanisms controlling benthic grazing. A research proposal is the appropriate way to address this topic.

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 to address the project objectives. By combining hydrodynamic and biological measurements, the study will provide data that have not been previously available. Some elements of the approach are experimental, such as the measurement of vertical fluxes of salt and sediment needed to calculate the vertical eddy diffusivity. The proposed research provides an excellent opportunity to test these methods further. The proposal makes several references to using the results in modeling, but it is not clear whether modeling is part of the proposed work or an anticipated indirect benefit of the project. The results will contribute to the scientific understanding of the physical environment of shallow habitats, and thus will inform decision makers. Incorporation of the project results into (ongoing) modeling of benthic grazing and sediment dynamics in San Francisco Bay will make the results more accessible 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 experimental approach is fully described, and the scale of the project is appropriate. The methods for answering the research questions from the data is not fully spelled out, but the data are pertinent to the questions. More detail on the proposed comparison of the results from the two study sites would be interesting. The proposed experiments are complex and problems in the field will no doubt be encountered. However, the inclusion of trial deployments and four separate experiments (in Grizzly Bay) increases the likelihood of success. Overall, the project proponents are likely to succeed in collecting data that will improve the understanding of shallow water physics and its relation to benthic grazing.

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 products and performance measures are peer-reviewed publications and Ph.D. theses, which seems appropriate for a research project.

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?

   See number 5.

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 is highly qualified to do this work. They have extensive experience conducting hydrodynamic and benthic community research in San Francisco Bay. They have also conducted research on concentration boundary layers in the laboratory, and are clearly well acquainted with the theoretical issues involved in the research.

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

   Yes.

Miscellaneous comments:

This proposal does an excellent job of linking research in hydrodynamics to ecological questions.

External Scientific: #5

Research and Restoration External Scientific Review Form

Proposal Number: **154**

Applicant Organization: **Stanford University**

Proposal Title: **Shallow open water habitats: Hydrodynamics and benthic grazing**

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 study would fill in a major scientific gap in ecosystem-scale processes in the Deltas shallow waters, and be particularly relevant to restoration in the region.**
-Good	
-Poor	

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

   This project is designed to address a significant gap in the scientific understanding of a potentially major interaction between shallow-water hydrodynamics in the Bay-Delta and a major, relatively unassessed ecological process (benthic grazing). The timing of this project would be extremely opportune, given the state of understanding about water column production and grazing.

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?

Background information and justifications are exemplary and provide the critical context to CALFED. The important fact that many of the benthic grazing power in the Bay-Deltas shallow water habitats are non-native bivalves (Corbicula fluminea and Potomcorbula amuriensis) substantiates the potential importance of the projects results.

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 close to perfect integration of detailed hydrodynamic measurements and phytoplankton and grazer biomass estimates.

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?

   As in all studies dependent on elaborate field measurements, the feasibility of this study is engendered with some risk. However, the investigators have ample experience and institutional capacity to pull it off. The scale of the project (two primary study sites in the Bay-Delta) is reasonable and the sites of particular value given background data and understanding.

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 principally product based, rather than indicators of field measurement, experiment and modeling performance, or timelines.

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 likely products of this research will be of extreme value in filling out more of the picture of the fate and patterns of phytoplankton (and detritus) grazing in Bay-Delta ecosystems. This team has a good record of providing interpretive context relative to CALFED restoration and Bay-Delta management.

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?

   No question: this is a highly capable and experienced teamprobably the best that could be mobilized to address this question.

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

   Given the extensive field experimentation and hydrodynamic modeling, the estimated three-year cost is ($471,661) relatively efficient.

Miscellaneous comments:

Prior Performance/Next Phase Funding: #1

New Proposal Number: 154

New Proposal Title: Shallow open water habitats: Hydrodynamics and benthic grazing

1. Prior CALFED project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   NOTE the Prior/Ongoing CALFED Project Title and Number do not match on the faxed list and the beginning and end of the title is missing -- you have listed ....matter in the habitat and its relationship to the food chain....as 97-B06?? Following are the three agreements with correct Title and Number and Project Manager that I have administered with USGS:

   CALFED #97-B02, USBR #98-AA-20-16230 - U.S. Geological Survey - Sedimentation Movement, Availability and Monitoring in the Delta - David Schoellhamer

   CALFED #97-B06, USBR #98-AA-20-16240 - U.S. Geological Survey - Assessment of the Sacramento-San Joaquin River Delta as Habitat for Production of the Food Resources that Support Fish Recruitment - William Sobczak

   CALFED #98-B07, USBR #98-AA-20-16950 - U.S. Geological Survey - Assessment of the Impacts of Selenium on Restoration of the San Francisco Bay-Delta Ecosystem - Sam Luoma

2. Prior CVPIA project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   N/A

3. Have negotiations about contracts or contact amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

   -Yes -No **X**N/A

   If no, please explain any difficulties:

4. Are the status, progress, and accomplishments of the applicant's current CALFED or CVPIA project(s) accurately stated?

   -Yes -No **X**N/A

   If no, please explain any inaccuracies:

5. Is the applicant's progress towards these project(s)' milestones and outcomes to date satisfactory?

   -Yes -No **X**N/A

   If no, please explain deficiencies:

6. Is the applicant's reporting, records keeping, and financial management of these projects satisfactory?

   -Yes -No **X**N/A

   If no, please explain deficiencies:

7. Will the project(s) be ready for next phase funding in 2002, based on its current progress and expenditure rates?

   -Yes -No **X**N/A

   If no, please explain:

Other Comments:

No personal knowledge of performance of Stanford University who is applicant of this proposal.

Note copy of table is incomplete and most project titles are also incomplete. Did not have a copy of this project sent over, so was unable to complete 2002 Proposal Title.

Prior Performance/Next Phase Funding: #2

New Proposal Number: 154

New Proposal Title: Shallow open water habitats: Hydrodynamics and benthic grazing

1. Prior CALFED project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   ERP 01-N20 - Transport, Transportation and Effects of Se and C in the Delta: Implications for ERP

2. Prior CVPIA project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   N/A

3. Have negotiations about contracts or contact amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

   -Yes -No -N/A

   If no, please explain any difficulties:

4. Are the status, progress, and accomplishments of the applicant's current CALFED or CVPIA project(s) accurately stated?

   -Yes -No -N/A

   If no, please explain any inaccuracies:

5. Is the applicant's progress towards these project(s)' milestones and outcomes to date satisfactory?

   -Yes -No -N/A

   If no, please explain deficiencies:

6. Is the applicant's reporting, records keeping, and financial management of these projects satisfactory?

   -Yes -No -N/A

   If no, please explain deficiencies:

7. Will the project(s) be ready for next phase funding in 2002, based on its current progress and expenditure rates?

   -Yes -No -N/A

If no, please explain:

N/A

Other Comments:

Applicant does not currently have a CALFED contract managed by our office. Contract 01-N20 Transport, Transformation and Effects of Se and C in the Delta, commenced Fall 2001.

Environmental Compliance:

Proposal Number: 154

Applicant Organization: Stanford University

Proposal Title: Shallow open water habitats: Hydrodynamics and benthic grazing

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

   -Yes **X**No

   If no, please explain:

   Sampling aquatic invertebrates will need a scientific collecting permit.

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:

   As long as project proponents obtain a scientific collecting permit, this project is feasible.

Other Comments:

Budget:

Proposal Number: 154

Applicant Organization: Stanford University

Proposal Title: Shallow open water habitats: Hydrodynamics and benthic grazing

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?

   XYes **-**No

   If no, please explain:

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

   -Yes **X**No

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

   budget summary is $471,661 and 17A is $616,605. No cost share funds identified.

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: