Proposal Reviews

#130: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

San Francisco Estuary Institute

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Final Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Final Selection Panel Review

Proposal Number: 130

Applicant Organization: San Francisco Estuary Institute

Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

Please provide an overall evaluation rating.

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

Amount: **$2,116,121.00**

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

None

Provide a brief explanation of your rating:

The ABAG CALFED Task Force and San Franciso Estuary Project, and the Clean Estuary Partnership commented on this application, as they have on other mercury-related proposals, encouraging outreach to people likely to catch or eat mercury-tainted sportfish and to urge coordination between wetland restoration and mercury research proposals. The Selection Panel believes the applicants should respond to these comments when their proposal is revised for consideration as a directed action, following their partcipation in the CALFED Science Program mercury workshop. The workshop will develop an integrated science strategy to address questions pertaining to potential linkages between wetland-restoration activities, the production of methylmercury, and contamination of aquatic biota, fish, and wildlife, which can influence human exposure to methylmercury. It will provide a setting to coordinate CALFED-supported mercury monitoring and research with the marsh restoration projects that the selection panel recommends, as suggested in the comment letter from the Clean Estuary Partnership. The applicants should consider and incorporate recommendations emanating from that workshop into their revised proposal.

The Selection Panel recommends that the applicants work with others to combine this proposal with two others (#131 and #196) to produce a single, integrated proposal that would (1) provide cost-effective monitoring of mercury in fish, producing information relevant to methylmercury exposure in humans and fish-eating wildlife, (2) be designed to facilitate linkage of fish-mercury

data to information on processes and factors affecting methylmercury concentrations in fish, and (3) include a coordinated outreach component to transfer information regarding methylmercury contamination of fishery resources to local stakeholders to facilitate assessment and communication of potential health risks of fish consumption.

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 130

Applicant Organization: San Francisco Estuary Institute

Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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: **$2,116,121.00**

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

None

Provide a brief explanation of your rating:

The scope of this proposal overlaps with two others (#131 and #196) that propose to monitor or survey methylmercury in fish and aquatic biota. As proposed, this project would spatially expand sampling of fish done for a previous CALFED project, to characterize contamination of sport fish throughout the Delta watershed. Efforts would focus on largemouth bass, a widespread species that is sought by many anglers.

The Panel agrees that measurement of mercury concentrations in sport fish can provide a very useful critical performance measure related to the mercury problem. Inventories of inorganic mercury are large in this ecosystem (watersheds, streams, tributaries, and Delta), and restoration activities could increase production of methylmercury and its concentrations in aquatic food webs supporting production of sport fish in parts of the system. Exposure of humans to methylmercury results almost entirely from consumption of commercial and sport fish.

The information obtained in the study, as proposed, would be useful primarily in risk communication, to inform the public about methylmercury contamination of fish and (presumably) to provide risk-based advice concerning consumption of sport fish. This would be accomplished by sharing of information with the public and stakeholders, including environmental health professionals. The Selection Panel doubts that substantial scientific understanding would accrue from tests of the four hypotheses listed in the proposal, given that the hypothesized spatial patterns in methylmercury contamination would be expected, based on published scientific work on mercury or on prior mercury investigations in the watershed.

The Panel believes that this work can be made much more cost effective by a much stronger linkage to other scientific work on processes and factors that affect methylmercury concentrations in fish. Such factors include methylmercury production and demethylation, abundance of methylmercury in water and the diet, food-web structure, and possibly, disturbances associated with ecological restoration activities.

The Selection Panel recommends that the applicants work with others to combine this proposal with two others (#131 and #196) to produce a single, integrated proposal that would (1) provide cost-effective monitoring of mercury in fish, producing information relevant to methylmercury exposure in humans and fish-eating wildlife, and (2) be designed to facilitate linkage of fish-mercury data to information on processes and factors affecting methylmercury concentrations in fish.

The Panel recommends that the applicants on this proposal participate in the Mercury Science Strategy Workshop being planned by CALFED for fall 2002. The applicants should consider and incorporate recommendations emanating from that workshop into a revised, integrated proposal that the Panel recommends be considered 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: 130

Applicant Organization: San Francisco Estuary Institute

Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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	**This proposal addresses the ecological and human health-related problem of mercury levels in sportfish in Bay-Delta watershed, and if implemented as stated will in fact provide essential baseline information for evaluating progress in remediating the problem of mercury contamination in sportfish While other external science reviews found fault with the incorporation of existing data and whether this project truly advances a deeper understanding of the factors controlling mercury accumulations and thus risk, all generally were in agreement that there could be substantial benefits to be derived from this project. Also not clear whether this type of activity, which primarily is monitoring for human health and safety, is appropriate for CALFED support rather than from the state health department.**
-Above average	
XAdequate	
-Not recommended	

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

   Good description of goals, objectives and hypotheses; this proposal addresses the important issue of methylmercury levels in sport fish and potential impacts on human human health.

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?

Sampling approach will concentrate on filling data gaps in spatial distribution of mercury in sportfish in the watershed. However, some reviewers questioned the extent of these data gaps, and the data gaps were not clearly documented in the proposal. The project proposed to synthesize and standardize data with those from ongoing or past similar studies, and properly focuses on a species (largemouth bass) that is both highly targeted by fishers and is broadly distributed throughout the study area. This project would be considerably strengthened by linking strongly with any funded studies on mercury biogeochemistry.

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?

   Products and their timing will be of value to managers in determining the scope of the mercury contamination problem in fish, but the proposal is too vague to realistically determine steps necessary to reduce mercury contamination of the studied watershed. However, communication of the results to agencies charged with protection of human health, fishing and fish-consuming groups, as well as the general public, should be very useful.

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

   Generally the costs were reasonable. A general sense that if these data are needed due to public health concerns, then the costs were 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?

   Generally ranked medium by regional panels.

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 issues noted

Miscellaneous comments:

Questions are raised by reviewers as to whether the information obtained from funding of this proposal would realistically allow management decisions to be made, yet some funding of additional mercury monitoring may be needed for human health reasons.

Bay Regional Review:

Proposal Number: 130

Applicant Organization: San Francisco Estuary Institute

Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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

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

The panel supports research that delivers scientific information which improves understanding about key ecosystem processes in the Bay + Suisun Marsh or about species and habitats which are insufficiently understood. This project doesn't focus on those areas, but instead is more directly relevant to Delta/Sac/SJ panels

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   Team qualifications strong.

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

   XYes **-**No

   How?

   Human health aspect of MR-5: ensure that restoreation isn't threatened by degraded water quality).

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?

   .

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

   XYes **-**No

How?

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Other Comments:

Doesn’t this just repeat some of what was done by EHIB program?

Delta Regional Review:

Proposal Number: 130

Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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

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

This is a solid proposal that meets all the panel's criteria.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   The project timetable appears reasonable. Project staff have collaborated previously and are experienced in work identified in this proposal. Largemouth bass, striped bass, white catfish and other sport fish will be sampled at approximately 100 sites each year in the first two years of the project, and their tissues will be analyzed for mercury concentrations. Department of Fish and Game staff is available to perform sample collection and laboratory analyses if necessary.

   o It is not evident from the text or in Table 1 (Project Time line) when the peer-reviewed journal article would be completed/submitted for publication.

   o No CEQA or NEPA documents will be required to complete the proposal.

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

   XYes **-**No

   How?

   o This project addresses ERP strategic goals #3, 4 and 6. o This project is consistent with ERP Draft Stage 1Delta and Eastside Tributaries Region Restoration Priority # 6 (effects of contaminants), Multi-Region Restoration Priority #5(mercury) and Sacramento River Region Restoration Priority #7 (implications of mine wastes for restoration).

   o This project is consistent with several priorities of the CALFED Science Program.

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?

o This project would build on the finding of two prior ERP projects - the sportfish sampling element of the CALFED Mercury Project (ERP-99-B06) and Effects of Wetlands Restoration on Methyl Hg Levels (ERP-97-C05). o This project would be coordinated with four other projects in this PSP to sample the same sites where feasible and to avoid overlap and/or to coordinate public outreach activities. The four projects are Transport, Cycling, and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries, An Assessment of Factors Affecting Bioaccumulation and Adverse Effects of Mercury to Birds of the Bay/Delta Watershed, Mercury in Delta Fish: Establishing a Network for Long Term Study, and Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of >Restoration, Remediation and the Regulatory Processes.

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

XYes **-**No

How?

o Environmental health officials form 20 counties have expressed support for and willingness to participate in this project.

o A two-tiered stakeholder advisory group will be created, consisting of a Central Advisory Group composed of personnel from State government agencies, representatives from the regional advisory groups and others, plus the regional advisory groups composed of personnel from county health departments and other local governments, local environmental groups, watershed groups, angler groups and others to be identified.

o Stakeholders will be alerted about possible mercury contamination from sportfish.

o Stakeholder input will be solicited in developing the fish sampling plan and in determined how to disseminate program results.

o County health department personnel will be educated about health risks from public exposure to mercury in fish.

o Stakeholders will be involved in developing, implementing and evaluating community-based outreach and education program elements.

Other Comments:

X

San Joaquin Regional Review:

Proposal Number: 130

Applicant Organization: San Francisco Estuary Institute

Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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

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

The committee ranked this proposal as medium in priority for the San Joaquin region. Although the proposal's subject is germane to the contamination problems in the delta and San Joaquin region, it has a high degree of overlap with another proposal from the same applicant and could be combined with that proposal to make a stronger proposal.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   Applicant has experience in the region and the experimental methodology is well documented. Project proposes to sample 100 sites/yr., 200 for the first two years of sampling. Applicant has additional staff to help with sampling (will primarily use CDFG staff to sample - no permits required). No ESA species included in sampling, only sportfish (largemouth bass). Although not specific to the San Joaquin region the project will include several water bodies in this region for sampling.

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

   XYes **-**No

   How?

   Proposal addresses Strategic Goals #'s 3, 4 & 6 (Harvested species, habitats, water & sediment quality). Also addresses Multi-regional #5 (restoration not threatened by degraded water quality), Sacramento Region #7 (conceptual models to support restoration of river, stream, and riparian habitat) and Delta region #6 (restore shallow water habitats for at-risk species while minimizing potential adverse effects of contaminants). Proposal addresses water quality issues and contaminants that are part of the San Joaquin region # 5 (Pesticides and contaminants) but mercury is not specifically addressed.

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?

Builds on 2 previous ERP projects, ERP-99-B06, ERP-97-C05 which looked at mercury contamination in the delta's ecosystems. Project proposes to coordinate with several other PSP proposals for the current round of funding. No specific regional coordination for this project, rather a multiregional coordination of projects and findings.

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

XYes **-**No

How?

Project will coordinate with local stakeholder groups, provide education to local populations regarding the level of mercury in the sportfish they consume and hold workshops and public meetings on the mercury issue. Local health agencies will be informed of findings and advised of risk to humans consuming fish from contaminated areas.

Other Comments:

Project has an interesting link to habitat restoration projects and the possibility of enhancing the methylation of mercury in the environment. This project overlaps significantly with another project that the applicants have also submitted for this round of funding and may be better if both projects were consolidated into one proposal.

Sacramento Regional Review:

Proposal Number: 130

Applicant Organization: San Francisco Estuary Institute

Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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

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

The panel felt that mercury issues are important but that this proposal dealt more with human health issues versus ERP goals.

In general, the panel refers to the technical panels on how the mercury proposals fit together and fit in with ongoing mercury activities.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   This panel believes this project is feasible and addresses several important issues regarding mercury in sport fish and human health issues. However, the panel has some concerns about the appropriateness of this proposal for consideration under CalFed's ERP solicitation as it primarily concerns human health issues. Perhaps this proposal would be better suited for EPA or Department of Health Services may have funding solicitations.

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

   XYes **-**No

   How?

   The proposal addresses Strategic Goals 3, 4, & 6; and PSP priorities MR 5, SR 7, and DR 6.

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?

   This project builds on other projects namely those conducted under the CALFED Mercury Project and UC Davis' Effects of Wetlands restoration on Methyl Hg Levels

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

   XYes **-**No

   How?

   This project has good stakeholder involvement, fills in data gaps, and addresses environmental justice issues. The concern of the panel is the project's appropriateness to ERP goals given that the project's objectives primarily address human health issues.

Other Comments:

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **130**

Applicant Organization: **San Francisco Estuary Institute**

Proposal Title: **MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM**

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

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

None

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**The project can be considered relatively good as a monitoring exercise. From the scientific viewpoint, details on how all objectives can be reached with more data on Hg in fish are lacking. However, it is critical to base any decision or remediating action on solid data from different sources.**
XGood	
-Poor	

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

   Goals, objectives and hypotheses are clearly stated. In the specific case of hypotheses, some of them (1 & 2 for instance) cannot really be considered as hypotheses. The main objectives of the proposal are all aimed at providing more information on the spatial distribution of Hg in fish. It is certainly important to base any decision or modelling program on the best and more complete set of data.

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?

It is certainly necessary to acquire more information and field data on Hg contamination in general. However, it is not clearly justified in this proposal why it is necessary to collect more data in the study area covered by the project. It appears to me that a lot of information on Hg in fish in this particular area is already available (Figures presented in this project). It is not very clearly explained how the collection and acquisition of data would allow to achieve some of the objectives dealing with public education or planning.

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 investigators justify the proposal on the basis of obtaining more data. The new data can be used to identify sources and priorities for remediation and public education and to identify landscape attributes associated with food web accumulation. Once gain it is not very clear how they plan to fill these objectives with data of fish only. The monitoring data on fish must be combined with other studies collecting information on water, sediment and watershed. Considering the numerous factors controlling the level of mercury in fish, it is not quite clear how the information can ultimately be useful to decision-makers. There is no planning to collect Hg data on sediments or waters. How can the mechanisms leading to the transformations of HgS to Hg2+ to MeHg+ be understood with the study? There is little or no reference to the presence and effect of selenium on the mercury assimilation. Several important references on Hg and Se, an important player in this sector, are missing.

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 described project is feasible. It is relatively simple to sample fish and analyze the Hg content. The scale of the project is consistent with the objectives but it is not clearly stated how all objectives can be reached on the basis of the monitoring program.

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 analytical work is under the responsibility of the subcontractor firms. The performance measures are presented as a bullet list that covers most of the important aspects to control the performance. More details could have been included in some of the measures (e.g. meetings, community outreach activities, association of spatial variation to landscape attributes).

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 importance of acquiring a large amount of good quality data to understand environmental problems and suggest action is certainly no more questionable. It is also well-known that the complexity of natural environment almost always require a multi-disciplinary approach and the combination of various data to understand specific problems. This particular monitoring project is a valuable product if the information can be combined to other atmospheric, geochemical and biological data.

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?

   It is difficult to assess without a publication record of the applicants. The applicants are already involved in other projects. It could be expected that the information obtained in other related projects can be used to complete the objectives of this proposed project.

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

   Difficult to assess.

Miscellaneous comments:

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **130**

Applicant Organization: **San Francisco Estuary Institute**

Proposal Title: **MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM**

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):

Some of the staff in my program have been involved in a small study in SF Bay that is examining various biomarkers of contaminant exposure in white croaker collected in 2000 under the auspices of the RMP that the SFEI and Jay Davis is interested in and is supporting in principle, but no funds have been appropriated for this work.

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 proposal addresses the serious ecological and human health-related problem of mercury levels in sportfish in Bay-Delta watershed, and if implemented as stated will in fact provide essential baseline information for evaluating progress in remediating the problem of mercury contamination in sportfish. See previous individual sections for specifics. While other external science reviews found fault with the incorporation of existing data and whether this project truly advances a deeper understanding of the factors controlling mercury accumulations and thus risk, all generally were in agreement that there were substantial benefits to be derived from this project.**
-Good	
-Poor	

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

Good description of goals, objectives and hypotheses; this proposal comprehensively addresses the critical issue of methylmercury levels in sport fish and potential impacts on human human health.

Rating--very good

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 well justified study; the conceptual model addresses the basis and hypotheses for the proposed study; baseline knowledge of the levels and spatial (geographical) distribution of mercury in popular sportfish over the entire watershed is needed for understanding potential threats to human health resulting from fish consumption. These data will also be important in evaluating proposed CALFED actions to create wetlands, floodplains and reservoirs to increase fish habitat and increase water storage, because high rates of methylmercury production may be likely in these areas (particularly those recently flooded). The findings from this study could seriously affect such plans. These data and information derived from this study will be particularly useful if combined with data on mechanisms of mercury cycling and methylmercury production that will result from studies such as proposal #237 or others identified in p.14 of the present proposal narrative. The data from this study that is designed to provide consistent baseline data on mercury levels in fish over the entire watershed will also be essential to evaluating habitat restoration methods, geographic areas of low and high concern, and overall future progress in reducing mercury bioaccumulation All tasks described in the proposal are fully justified and contribute to this integrated, comprehensive study. Advise inclusion of Task 5 (Stakeholder Coordination) as essential to success of project in terms of its design, implementation, communication of results, and actions related to human health policy. An interested stakeholders group already exists (see Table 2county public health officials), and the process of stakeholder group formation and activities that will invest these stakeholders is documented. Proposed research addresses a major objective of CALFEDs comprehensive planproviding good water quality for all beneficial uses (consumption advisories on fish consumption represent a beneficial use impairment, as well as addressing strategic goals of the Ecosystem Restoration Program (ERP). These include maintenance or enhancement of fish species for commercial or recreational harvest, habitat restoration (including choosing methods that will not exacerbate the mercury contamination problem), and especially the maintenance or improvement of water and sediment quality to support healthy ecosystems and elmination of toxic impacts on fish, wildlife, and humans (especially developing fetuses and young children). The project is also justified in terms of priorities of the CALFED Science Program, and objectives of the CALFED plan as fully detailed in the proposal. Funding of this proposal and application of the resulting products will better ensure that the important problem of mercury contamination in fish is not dealt with in a piecemeal fashion.

   Rating--very good

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?

   Sampling approach will concentrate on filling data gaps in spatial distribution of mercury in sportfish in the watershed and will synthesize and standardize data with those from ongoing or past similar studies, and properly focuses on a species (largemouth bass) that is both highly

targeted by fishers and is broadly distributed throughout the study area. While specific sampling sites are not identified, criteria for selection of sampling sites and species are logical and designed to address the questions posed, and the 200 sampling sites proposed should certainly provide a broad enough geographical coverage. The approach is adaptive, in that sampling in year 2 will address any shortcomings or unusual findings from year 1. The data will be collected in such a way (indiv. fish) as to evaluate the size:Hg relation ship. I do recommend, however, the collection of age data via otolith or scale analysis, since size is often not a good predictor of age in fish. Analytical and QA procedures for determining mercury levels in muscle are appropriate, and have been routinely used in previous research. This study will provide the first standardized and integrated database on mercury levels in sportfish from the Central Valley, which will be essential to future management decisions.

Rating--very good

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?

   Sampling approach is fully documented and fairly straightforward, although precise sampling locations are not yet identifiedthese would be chosen after review of existing data and consultation with local agencies, community groups, and fishers. Feasibility is very high, based on past successful cooperation among the various groups represented in the proposal.

   Rating--excellent

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?

   Peer review provided in all phases, using model established in the CALFED Mercury Project. Steps to evaluate performance are comprehensive and logical.

   Rating--very good

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?

   Products and their timing will be of great value to managers in determining the scope of the mercury contamination problem in fish, steps necessary to reduce mercury contamination of the studied watershed, and communication of these data to agencies charged with protection of human health, fishing and fish-consuming groups and the general public.

   Rating--very good

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?

   All groups involved in the project have performed similar cooperative work before, including several under the auspices of CALFED. The PI (Davis) has a strong track record for similar research in the SF Bay region and Central Valley, and is especially adept at networking to achieve maximum effectiveness of effort. Stephenson (SJSUF) and Ishikawa (CDF&G) also have

extensive experience and success in similar research. Mack (Cal. Dept. of Health Services) will provide a critical , experienced link to the community and stakeholders for communication of the results of this study. Quality of past performance in CALFED funded projects is not known to the reviewer, but should form a partial basis for funding of the proposed project. Coordination with other mercury related project proposed to CALFED (see p. 14 of this proposal narrative) will enhance the value of the present project and prevent overlap of efforts.

Rating--very good

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

   Budget items appear reasonable, although the overhead rate of 153% on salaries appears quite high. Reviewer rates the benefits from data and decisions arising from this project is very high, especially in terms of human health protection.

   Rating--very good

Miscellaneous comments:

It is essential that if funded, this project closely coordinates with other projects studying biogeochemistry of Hg.

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **130**

Applicant Organization: **San Francisco Estuary Institute**

Proposal Title: **MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM**

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 PIs propose an expensive project designed to map the distribution of Hg in sport fish in the Bay. There are so many factors that influence bioaccumulation and the PIs really have not addressed many of them. These are straightforward techniques that they have proposed without application of ancillary data (for instance, stable isotopes) that would definitely strengthen their study. Even gut analyses would help. As it is designed, this project may not supply the necessary information to form a predictive model.**
-Good	
XPoor	

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

   The PIs present an ambitious proposal to characterize the concentrations of Hg in sport fish from a number of sites in the Bay-Delta region. They have identified a number of goals that range from filling data gaps to identifying land use/land cover attributes that enhance MeHg accumulation to public outreach. They also present four rather simple hypotheses that drive their research. I certainly agree that Hg contamination is an important issue in the Bay-Delta Area. They plan to involve stakeholders in the development of the plan and approach.

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?

   Based on limited existing data, the PIs have identified that elevated levels of Hg have been identified in rivers that drain areas of historic gold mining. A conceptual model is presented, but at this point, the team has not identified sites for sampling and intends to choose the sites based on input from local agencies, community groups and anglers. This hardly appears to be hypothesis-driven research. It is classified as a research project, but is better described as enhanced monitoring.

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?

   There is a pressing need to obtain more information on the concentrations of Hg in fish of this sensitive ecosystem. However, that would appear to be a task for a state monitoring agency. This study is a monitoring project with very little thought given to processes that enhance bioaccumulation.

   The PIs have proposed to sample fish at approximately 100 sites for two years. Thats about the extent of the detail of sampling strategy. Wouldnt it be a much better study to look at food chain dynamics at a specific number of sites? It seems that there is a real leap of faith to say that a concentration of Hg in a predatory fish is a direct result of a land cover attribute or a gold mine upstream if there is no consideration of the processes and transformations occurring somewhere between elemental Hg and accumulation oin upper trophic levels. This is an extremely expensive project to map the distribution of Hg in fish tissues.

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 documented, this proposal appears a bit off base in identifying the extent of the problem and identifying the cause of contamination. It has a fairly low likelihood of success, especially with regard to objective 4. A better developed strategy for sampling and interpretation is warranted. This is a lot of work and funding for merely mapping distributions of Hg in fish.

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 authors have presented a stepwise list of performance measures and they should use this type of approach in a resubmission.

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?

   I am not certain that there will be any other results of this project than reports and maps of distribution of Hg in fish of the Bay-Delta region. I cant see that these results will allow for a predictive tool for management concerns.

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?

   While the applicants have experience in mercury projects and public health, they really need to pool their efforts with a Hg biogeochemist who can help better define processes of transformation leading to bioaccumulation. The high levels of Hg in fish must be verified by high levels in other key components of the food web. Most analyses are planned to be subcontracted.

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

   This is an extremely expensive project designed to collect information on fish Hg levels. Without a conceptual model of food web dynamics and bioaccumulation, the data may not be that useful.

Miscellaneous comments:

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **130**

Applicant Organization: **San Francisco Estuary Institute**

Proposal Title: **MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM**

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	**I am rating this project poorly based on its inability to advance the understanding of the factors that affect mercury concentrations in fish from this watershed. It is apparent from previous studies that mercury concentrations can be quite high in sport fish and can vary by 2-3 times within the watershed. While the study would provide information to those assessing human health risks of sport fish consumption, would build upon the current database on mercury in fish, and would improve communications with stakeholders, the survey approach would not advance the science in this field. Such an advance in the understanding of what causes the variability in fish mercury concentrations is key in developing remediation strategies and reducing the health risks of fish consumption.**
-Good	
XPoor	

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

   The main goal of this project is to improve upon the current understanding of mercury concentrations in important sport fish species from the Central Valley. In consultation with representatives from many counties (including fisherman), the investigators propose to collect fish from 200 sites in the Central Valley, to analyze these fish for mercury, and to use

these results to understand the spatial variability of mercury in fish. A major component of this proposal is the consultation and communication of results to stakeholder groups in order to reduce the risks that this contaminant poses to human health. These aspects of the proposal are clearly stated and internally consistent. Because of its tendency to accumulate to high concentrations in fish and its toxicity to humans and wildlife, mercury contamination is an ongoing and potentially serious threat to the health of ecosystems and humans. It certainly is an important and timely issue in the region given the importance of sport and subsistence fishing, the potential for habitat restoration to augment the existing problem, and the contamination of reaches due to mining activities.

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 approach is justified for meeting the projects goal of assessing the current concentrations and variability of mercury in sport fish in this watershed. Given the previous fish surveys that have been conducted in this region, I was surprised at how little discussion there was in the proposal of the existing mercury data and what has been learned to date. The cited report from the previous study by the investigators (Davis et al. 2001) indicates depressed mercury concentrations in fish from the Delta region. What are the hypotheses as to why concentrations in bass from this region are 2-3 fold lower? It seems logical to me to pursue the factors underlying this variability (see discussion in approach below). The authors state in the proposal that previous studies have sampled only a fraction of the watershed, and much of the watershed that could be expected to also have high mercury in sport fish has not been sampled with methods that would allow comparisons with other recent studies. It was not clear to me what is lacking in the existing data that would warrant further sampling, and how much of the watershed might be impacted by mining, impoundment or other human activities that are known to increase the concentrations of mercury in fish. It was not clear in the proposal why the existing data is inappropriate or inadequate, and whether additional sampling and analyses are justified. What is the measure of inadequate regional distribution? That being said, I do understand the importance of quantifying the concentrations of mercury in sport fish in a region where there is heavy use of this resource. As I discuss below, my concerns are not about the proposals ability to generate data on fish mercury concentrations, but about the extent to which the data could be used to improve upon the understanding of factors affecting mercury concentrations in these fish.

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?

   To meet the main goal of this proposal the investigators will consult with local stakeholders to identify sites of concern with respect to mercury contamination, and then net and analyze fish from these locations as well as other sites chosen based upon their catchment characteristics and proximity to mining sites. The resulting data will be communicated to the stakeholders, pooled with existing information on mercury in sport fish, and then used in conjunction with GIS to examine the influence of watershed characteristics (such as the presence of wetlands) on fish contaminant concentrations. It is evident from previous surveys in this watershed that mercury concentrations in one species can vary considerably across locations. While I agree with the investigators that it is important to understand this variability, I do not feel that the approach outlined in the proposal will improve upon the current understanding of the factors affecting mercury concentrations in these fish. The study is designed to and would generate a considerable amount of data on mercury concentrations in fish from the watershed. These data would expand

the existing database, would provide some baseline data to look at temporal trends, and would be useful to those involved in assessing the risks of fish consumption to human health. In addition, the study would likely also be successful at improving the general publics understanding of mercury in fish though this is an area of the proposal that I am much less qualified to judge. The investigators would be able to meet the objectives of the study as outlined on page 3 of the proposal. As they state in the proposal, there are several factors affecting the fate of mercury in aquatic systems and its uptake into fish including water chemistry, catchment characteristics, and contaminant inputs. While the importance of catchment characteristics will be addressed in the study design, there are several other critical factors that would not be examined herein that will make interpretation and understanding of spatial trends very challenging. Mercury concentrations are significantly influenced by the dietary habits of the fish, their growth rates, the length of the underlying food chain, and processes at the base of the food web. Individuals of the same species can have variable dietary habits, can grow at different rates and utilize their habitat differently. No mention is made of assessing fish growth rates or their dietary habits either through short-term snapshots using gut contents or longer-term approaches using stable carbon and nitrogen isotope ratios. Without this information and linkages to lower-food-web processes such as methylation rates, food web structure and habitat utilization (including diet), I feel that these fish mercury data would only bolster existing survey data and not improve the understanding of factors affecting regional differences. While information on the catchment characteristics may explain some of the regional variability, there are confounding factors such as age of reservoirs and vegetation type that would not be addressed in a mapping approach. A survey of fish mercury concentrations, as proposed herein, would not generate novel information from a scientific standpoint. It is already known that fish concentrations vary in the region, and that the levels are influenced by the presence of wetlands and historical contamination by mining. However, the information generated by this research could be used by decision-makers to avoid wetland creation in reaches where mercury concentrations in fish are already known to be high. While it is evident from the proposal that 100 sites would be sampled each year for two years, it was not clear to me in the proposal how many fish of each species would be collected and analyzed. In the budget, it is stated that 5% of all samples would be sent to an external lab for confirmatory analyses. Based on these numbers, the investigators seem to be targeting 2000 fish each year or 20 fish per site. It is stated that 5 fish will be collected within a narrow size range to be consistent with previous studies and that additional fish will be collected outside this range to understand mercury-size relationships. I found the sampling strategy vague here, making it harder to assess the usefulness of this dataset. It seems to me based on the numbers of fish per site, that a thorough analysis could only be done on 1-2 species of fish. The report by Davis et al. (2001) on the previous mercury survey indicates differences in the mercury-length relationships of bass across sites and some of this variability may be related to low sample numbers (though preliminary data are presented therein).

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 each of the first two years the investigators propose to meet with stakeholders to identify sampling sites, sample (I believe) 20 fish at each of 100 sites, and analyze tissues from these fish for total mercury. The third year of the study will be used to continue with the community education, and data integration and interpretation that began in the first two years. It is technically feasible to do what the investigators are proposing both within each year and over the three-year period of the study. While I am not clear on some of the details of the fish sampling (as I outlined in section 3), it is possible to sample that many sites each year. The scale of the project is also consistent with the objectives outlined in the proposal. I am less certain about the ability of the laboratory to process that many samples per year given the lower numbers of fish analyzed by the same lab in 1999 (again from the Davis et al. 2001 report). This may be related to some

problems with the analytical methodologies that occurred between years which likely would not be a factor in future analyses.

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 investigators have included some milestones in the proposal that would allow for continued scientific input to the project such as peer review of progress reports and presentations at scientific conferences. These performance measures would be enough to measure the success of the project, given the straightforward nature of what is proposed.

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 value of this proposal lies in the fish mercury data that would be generated by sampling an additional 200 sites in the watershed, and in the increased awareness of the problem by the general public. These data would be of use to people involved in assessing the risks that mercury-contaminated fish pose to human health, but they would not improve upon the understanding of the complex processes that control mercury accumulation in these food webs and concentrations in top predators.

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?

   It was difficult for me to assess the track record of the project team because there are no primary publications yet from the recent Calfed Mercury Project, and because the report published on the web for this project is a progress report only. Likely much of the data generated in this study was not in the report, and some of the overall project objectives had not yet been completed at the time the report was produced. Previous studies by the investigators are quite similar to what is proposed herein and it seems logical to me that their experience in fish sampling, mercury and data analysis, and community-based health programs would improve the likelihood of success in this project. It appears from the proposal that the investigators currently have or have budgeted for the infrastructure (e.g. new electroshocking boat) and other support necessary to conduct this project.

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

   In terms of sample collection and analyses, the costs of most of the budget items seem reasonable and the time budgeted to complete or conduct sample collection and sample and data analysis seem fine. The costs associated with community consultation and education also seem reasonable and adequate. However, there are some things in the budget that dont make sense to me. Under the Services section of the budget justification, it appears to me that there is less time (about ½; 81K-39K for travel divided by $31/hour = 1375h) budgeted in the contract for G. Ichikawa and J. Goetzl to collect fish than what has been budgeted for SJSUF and DFG staff yet the travel costs for the former group are three times as much (37K as compared to 12K). In the same section, there is 48K and 5K budgeted in years 1 and 2, respectively, for equipment. The 48 K is for the new boat but it is not clear to me what the 5K is for [both a backpack shocker (5K) and an electroshocking motor (10K) are included in the description]. Under the Services section

for Task 2B there is salary, benefits, supplies and indirect costs for SJSUF staff to process samples. The total in the detailed description comes to 18.3K for Year 1 and 17.8K for Year 2. However, in the budget summary, totals are given as 36.8 and 37.1K, respectively for Task 2B. The total budget of this project is large and, from a scientific perspective, I question the value of additional mercury surveys. As I have stated previously, this type of project doesnt have the level of detail necessary to improve upon the current understanding of factors affecting mercury concentrations in fish from this region. More detailed evaluations at sites are necessary in order to develop mitigation strategies, and to reduce the impacts of human activities on fish mercury concentrations. However, if additional data on fish mercury concentrations are needed to more accurately assess and understand the risks to human health in the region (something I cannot judge), then the cost/benefit of this project is acceptable.

Miscellaneous comments:

External Scientific: #5

Research and Restoration External Scientific Review Form

Proposal Number: **130**

Applicant Organization: **San Francisco Estuary Institute**

Proposal Title: **MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM**

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	**Overall, this project has definite merits in defining where sport fish should and should not be consumed. I don't believe that it will provide detailed information as to what sources or processes are leading to these distributions, however. It will further be important to establish baseline data for comparison to post-management distributions. The project includes a strong public information component, which is useful as fish Hg is a topic that non-scientists ccan relate to. The sampling/analysis portion could be emphasized, making for a better cost/benefit ratio.**
XGood	
-Poor	

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

   The project goals and hypothese are very clearly stated, and directly relate to important concerns regarding Hg contamination in the Bay Delta system. The approach directly targets the stated hypotheses. Knowlede of the distribution of contaminated fish is a critical element for management decisions, as well as establishing relationships between fish levels and landscape attributes. It was nice to see an emphasis on involving/informing the public, as sport fish Hg is something that a non-scientist can relate to.

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 proposal does an excellent job stating the Hg problem, and conceptual models associated with the Bay Delta system. This project aims at further quantifying the distribution of contaminated sport fish, thereby supporting human health advice and giving clues as to internal sources and processes. Sport fish Hg content is arguably the most important performance measure of CALFED's activities, so getting baseline data is a priority. While sportfish are long-time integrators of Hg contamination, they may not necessarily be reflective of local sources. Small fish, inverts, etc. may be better indicator species than LMB for this purpose. Further, CALFED may wish to consider whether transferability of data to other aquatic systems is a priority, or whether site specific data is adequate.

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 proposal is well designed to establish Hg patterns in sport fish, and will likely yield relationships to land cover GIS types. Strong relationships may be difficult to observe, as sport fish may integrate Hg from a number of regimes. While this study is not technologically novel, its data set will significantly add to the knowledge base of the Bay Delta system. This information will definitely be useful to managers in terms of health advice, but I wonder how predictive it will be towards future management activities (flooding, wetland creation, etc). Perhaps the inclusion of some experiemntal activities such as MeHg production rates vs.sediment type would more directly get at these questions.

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?

   Mercury content in fish is a fairly straight forward analysis, and I don't forsee any technical problems with clean fish collection or analysis. The authors plan on sampling 200 sites over two years. This will likely be successful, as they have plenty of prior experience with similar projects in the local area. The project scale is in line with the objectives. With such a large and complex system, I suspect that 200 stations are required to adequately assess spatial variation...

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 performance measures are adequate and standard, including peer review and quarterly/annual reports. Community forums and symposia are good methods to notify the general public of study progress.

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?

This project will produce a dataset that the general public will be able to relate to, including maps of spatial distributions of fish Hg, and plenty of accessible material in their outreach programs. This data will ultimately be useful to managers, primarily for imposing consumption advice. These maps may infer processes controlling Hg bioaccumulation in the Delta system, but direct measurements derived from experimentation would be more suitable. Data from this project will likely fit nicely with other more process-oriented studies proposed for the Bay Delta region.

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 authors are experienced in Hg research, particularly in the local area, and are well qualified for such tasks. I did not see evidence of direct GIS experience, but this is liely embedded in other research projects. As Hg samples will be collected and analyzed by an established group at Moss Landing, technical issues are not a concern.

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

   Overall, the benefits of spatial mapping are justified by the costs. I would suggest, however, that from a purely scientific viewpoint, the sharholder and public outreach portion of the project could be scaled back to achieve a much leaner budget for the same amount of data collection.

Miscellaneous comments:

Prior Performance/Next Phase Funding: #1

New Proposal Number: 130

New Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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

   CALFED #99-B06, USBR #99-FC-20-0241 - San Jose State University Foundation - Assessment of Ecological and Human Health Impacts of Mercury in the Bay-Delta Watershed

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:

While I administer CALFED Agreement 99-B06 with the San Jose State University Foundation, I have no direct knowledge of SFEIs performance on that project.

Did not have a copy of this project proposal sent over, so was unable to complete 2002 Proposal Title as part of the titles are covered in the copy of the table sent to us.

Other Comments:

Prior Performance/Next Phase Funding: #2

New Proposal Number: 130

New Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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

   ERP 99-N07 ? Chronic Toxicity of Environmental Contaminants in Sacramento Splittail- A Biomarker Approach

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?

   XYes **-**No **-**N/A

If no, please explain:

Other Comments:

Environmental Compliance:

Proposal Number: 130

Applicant Organization: San Francisco Estuary Institute

Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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

   XYes **-**No

   If no, please explain:

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: 130

Applicant Organization: San Francisco Estuary Institute

Proposal Title: MERCURY IN CENTRAL VALLEY SPORT FISH: DEFINING THE MERCURY PROBLEM

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).

   Funding brought forward is $.27 difference.

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: