

Agenda Item: 9B
Meeting Date: July 8, 2004

CALIFORNIA BAY-DELTA PUBLIC ADVISORY COMMITTEE

SCIENCE PROGRAM PROPOSAL SOLICITATION PRIORITIES AND SELECTION PROCESSES AND CRITERIA

Summary: The CALFED Science Program has developed a proposal solicitation package (PSP) including priorities and selection criteria intended to fill science gaps identified in the Multi-Year Program Plan approved by the Authority in August 2003. These priority issues focus on water management and biology questions developed through workshops, symposia and extensive stakeholder and agency input.

Recommended Action: BDPAC recommend that the Authority authorize its staff to release the Science Program's PSP.

Background

The California Bay-Delta Science Program's PSP is a key element to providing CALFED agencies and stakeholder community with priority information needed to support program-wide management. The process is designed to make maximum use of limited funds by only selecting proposals that are both highly relevant and of high quality, with a good probability of success.

The development of priorities begins before the release of the PSP when priority issues are identified in the Program Plans. Science agendas are developed through workshops and white papers, with significant input from stakeholder and agency representatives. The science priorities and objectives identified for this PSP (see Attachment 1 for more details) are also based on the gaps identified in the Multi-Year Program Plan approved by the Authority in August 2003:

- Water Operations and Environmental Resources
- Environmental Processes in the Sacramento-San Joaquin Delta and their Relationship to Water and Critical Species Management
- Implications of Future Change on Hydrology, Water Operations, and Environmental Processes
- Performance Assessment

A total of \$19 million is available to support studies that address the priority issues through this solicitation. These are funds derived from a range of sources including Propositions 13 and 50. Each fund source has different topical and administrative criteria: Some are available for immediate expenditure, while Prop 50 funds are subject to approval through the current State budget process. The Science Program will match the proposals recommended for current funding to the appropriate sources as the final step in the selection process. This solicitation process may also be used for future funding sources as they become available.

In addition, the Science Program staff will be working closely with the Ecosystem Restoration Program (ERP) and its Monitoring PSP, which is also under development at this time. Science and ERP staff will work together to ensure that the two grant solicitations are complementary, and may ultimately choose to consolidate the two processes.

Solicitation Process

The process outlined for this solicitation builds on a successful model of the ERPs 2002 PSP and expands the scope to CALFED-wide and cross-program science. The PSP package will be distributed through the Science Program website (<http://science.calwater.ca.gov>), as well as broad outreach throughout the scientific community. Submitted proposals will be reviewed using a multi-step evaluation process (see Attachment 2), beginning with an administrative review by Science Program staff, which will provide information to the Selection Panel on the past performance of CALFED Program's funded projects.

The process continues as each proposal is then reviewed by three independent science experts selected based on their expertise in the specific subject area of the proposal. These reviews are critical and provide the Science Program with the precise information needed to make a good decision on the quality and probability of success of a specific proposal. The reviewers will evaluate submissions using a set of criteria that combine classic scientific review questions and elements designed by the Science Program to address common issues (see Attachment 3). The subject experts will also make overall recommendations to a Technical Panel as to whether proposals are excellent, very good, good, fair, or poor, and explain their recommendations.

The second step is to synthesize the results of all the individual subject reviews into a single "grading" system and set of recommendations. This is accomplished by having a Technical Synthesis Panel evaluate and provide unbiased ratings of each proposal's technical quality based on the individual subject reviews. Members of the Independent Science Board, the Lead Scientist, and some of the individual subject reviewers will comprise the Technical Synthesis Panel. The Technical Panel will also identify proposals that qualify for special consideration under the "multi-institutional and multi-disciplinary studies" category. These will be forwarded to the Bay-Delta Science Consortium for a review based on Collaborative Evaluation Criteria (see Attachment 4).

To evaluate the recommendations put forth by the Technical Synthesis Panel, the Science Program will convene a Selection Panel, which will be comprised of technical and resource-management experts covering a broad range of expertise. The Lead Scientist, or designee, will serve as a non-voting director for the Selection Panel with primary responsibility for assuring that the discussion is balanced, fair and comprehensive. The Selection Panel will make its final recommendation to the Authority and the other funding agencies for the 2004-05 Authority research budget, after consideration of all the review information and availability of funds. The Selection Panel strategic funding recommendations will be based on the following criteria:

- Strategic benefit toward accomplishing CALFED Program goals
- Meeting one or more of the priorities described in this call for proposals
- Funding availability and constraints

Summary

Building on the experience gained by the ERPs PSP in 2002, the Science Program has incorporated strong elements into this proposal process and clearly defined how proposals will be evaluated at each step. Although managing this process takes a significant amount of staff time, with the help of flexible contracts, it will be possible to bring on expert reviewers quickly to expedite each of the review steps. The process will also apply to future PSPs. This continuity will provide the science community with confidence when submitting their proposals and thus benefit the needs of Authority to fill high-priority science gaps. Since the ERPs 2002 process is generally regarded as the most professional and high-quality funding process yet conducted under CALFED auspices, the Science Program expects a high level of success for its effort.

Fiscal Information

This item does not require approval of funding at this time; however once proposals have been selected, the Authority will be asked to approve funding for proposals selected through this process.

List of Attachments

- Attachment 1 – Science Program Proposal Solicitation Package Priorities and Objectives
- Attachment 2 – PSP Process Outline
- Attachment 3 – External Scientific Review Evaluation Criteria
- Attachment 4 – Bay-Delta Science Consortium Collaboration Evaluation Criteria

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Science Program Proposal Solicitation Package Priorities and Objectives

Many needs exist to make sure the best available scientific information is used as the CALFED Bay-Delta Program makes policy decisions. The focus in this PSP is on needs that have been defined as the highest immediate priorities through consultation with stakeholders, managers and the scientific community. Proposals that bring out compelling ideas outside the areas of priority will also be considered, but they must be exceptional to be funded. The Science Program 2004 proposal solicitation process will award approximately \$19 million.

The approach used by all CALFED programs to develop science priorities is relevant to decision makers across programs. Key issues were identified from discussions of programs, actions, and uncertainties among staff, stakeholders, managers, and science advisors. Scientific questions relevant to these issues were developed from white papers, review papers, workshops, standing panels, or ad hoc technical review panels. CBDA staff, agency staff, and selected expert advisors then produced an agenda of scientific needs, which is summarized in the 2004 Science Program Implementation Plan. The proposal solicitation package is used to solicit studies to help fill these needs.

There are four priority topic areas for the 2004 call for proposals described below. Selection of projects from this solicitation will focus on issues and processes relevant to the Delta Region because that region is the focal point for simultaneously managing water supplies and ecosystem resources and because many changes are being considered for the Delta ecosystem. But some of the topics that follow also offer many opportunities to address questions that cut across CALFED goals and regions. Proposals that can show the relevance of their studies to cross-cutting questions will also be given strong consideration.

Proposals will be evaluated on their relevance to the management needs described here and in supporting documents, including the 2004 Science Program Implementation Plan, the likelihood to generate new knowledge, and effective communication of results to managers and the CALFED community. Equal consideration will be given to studies that will yield information in the short- or long-term, and on studies that focus on single critical species or ecosystem processes.

Water Operations and Environmental Resources

Linkages between water operations and environmental resources, particularly critical aquatic species¹, must be better understood if we are to meet CALFED goals laid out in the Record of Decision. CALFED has launched a vast number of projects supporting both improving water supply reliability through a combination of storage, conveyance improvements through the Delta, and water conservation and restoration of ecosystem processes and critical species populations. The credibility of ecosystem management and measures taken to modify water management in support of biological resources ultimately depends on showing how management

¹ . Critical species include salmonids (especially threatened or endangered runs and species), delta smelt, longfin smelt, Sacramento splittail, and green sturgeon. It is also important to understand fish communities and interactions between native and non-native species.

actions are actually helping restore populations of critical species.

During recent CBDA Science Program workshops and reviews, a number of questions relevant to water operations and environmental issues were raised repeatedly, including:

- What are the effects of large water diversions in the Delta and smaller diversions throughout the system on salmon and smelt at different life stages?
- What are the ecological benefits of different uses of environmental water assets in streams, rivers, the Delta, and the Bay?
- What is the relative importance of difference sources of stress, such as predation and direct take by export facilities, on critical species?
- How do environmental processes and water operations combine to affect the distribution, fate, and population success in native or threatened species?

Environmental Processes in the Sacramento-San Joaquin Delta and Their Relationship to Water and Critical Species Management

The Sacramento-San Joaquin Delta (Delta) is the hub of water management and ecological issues in California and is the core focus of CALFED. Management of water supply reliability, environmental resources, water quality and levee integrity also require better understanding of basic processes in the Delta and the other ecosystems to which it is tied. Operations of the Delta Cross Channel, decisions on a Through-Delta Facility, long-term commitments of contracted water, improvements proposed for the South Delta, decisions about configurations and facilities near the large diversion points, and the use of the Environmental Water Account and shallow water habitat management in support of critical species, and are examples of issues that would benefit from a better understanding of linkages between water operations, environmental processes, and populations of critical species.

We are beginning to understand how to most effectively operate diversions at the Delta Cross Channel for both fish and water quality as we learn the detailed linkages between flows and fish movement at such junctions. Detailed knowledge of processes in the San Joaquin River and the Stockton Ship Channel are pointing toward solutions to alleviate the reduced dissolved oxygen problem in that region. New knowledge of mercury distributions and methylation processes has set the foundation for a comprehensive mercury strategy for the Bay-Delta system. These are all well-defined or locally constrained issues. New knowledge has also pointed out important challenges that cut across different goals of the CALFED Bay-Delta Program. For example, management actions like closing the Delta Cross Channel gates are designed to keep salmonids out of the Delta in response to catch-release studies that show a reduction in survival rates for salmon that enter the Delta. But environments like the Delta can play an important nursery function and some restoration actions are designed to create habitat that might be useful as nursery habitat. So, is there greater net benefit in keeping salmonids out of the Delta or in letting them in at some times? Similarly, maintaining low salinity water in the central Delta is critical to sustaining drinking water quality, but some variability in salinity seems to benefit native fishes. Shallow water habitat and wetlands were thought to favor native fishes, but shallow water habitat can take many forms in the Delta with different outcomes for natives. Delta issues are responsive to water and environmental management upstream and downstream of the Delta, and

processes in the Delta are linked to processes in the rivers, the estuary, and ocean. Where analyses of the relative importance of stressors or the life stages of critical species require considering processes in the rivers, the estuary or the sea they are relevant to this solicitation.

Implications of Future Change on Hydrology, Water Operations, and Environmental Processes

CALFED has launched a vast number of projects supporting water conservation, surface and groundwater storage and management, ecosystem restoration, and refinements in water operations in support of the core program goals. Many of these projects and improvements are designed for the current climate regime and population distributions, but important changes that could have significant implications for the long-term success of CALFED are predicted in both. Specific management questions that would help unravel likely scenarios and interactions between climate, operations, and restoration changes include: What are the most likely scenarios for future changes in climate and what implications do they have for predicted effects of CALFED actions? What are the implications for Delta ecosystem processes and important management factors (such as salt concentrations and flux and critical species abundance and distribution) of forecasted changes in precipitation, hydrology, and temperature and do those implications change under different operational regimes?

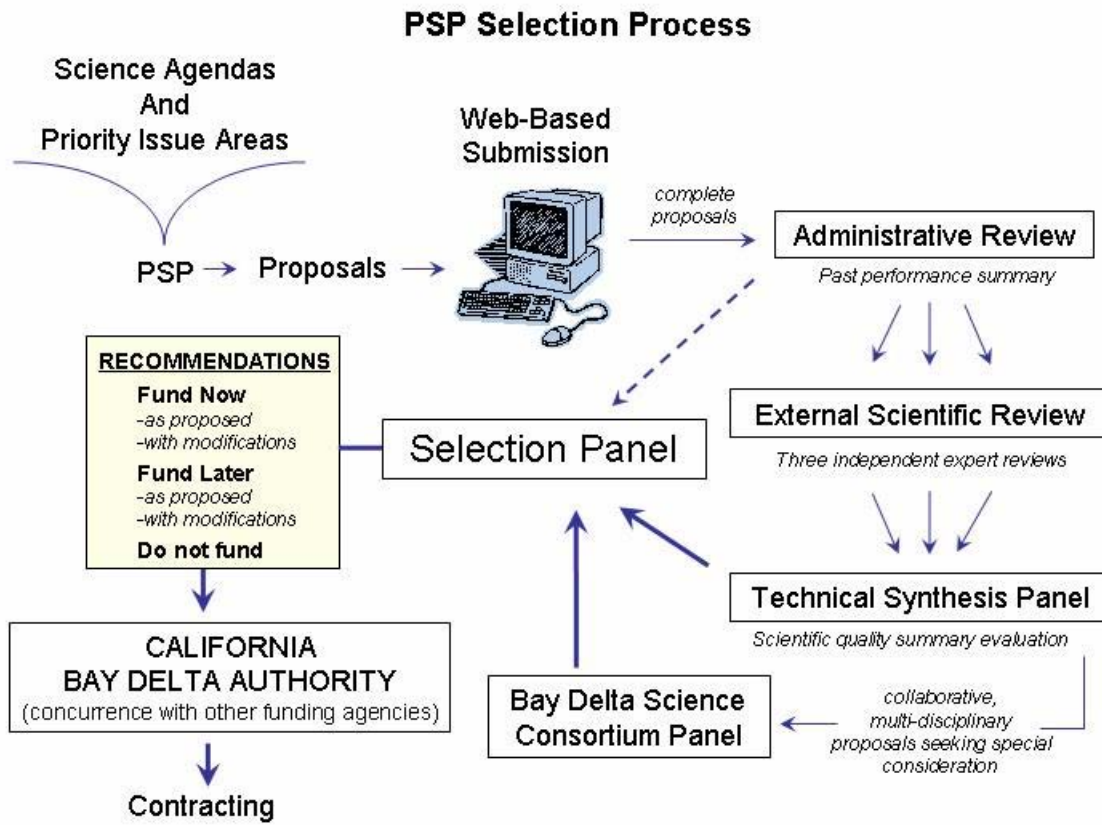
There are two basic science needs associated with evaluating the reliability of CALFED's solutions under future scenarios: improving current water operations modeling including developing and building links to environmental models, and developing methods for "gaming" or evaluating combinations of CALFED actions under likely future scenarios for changes, including climate shifts. Current modeling approaches would be improved by studies ranging from a focus on the modeling tools themselves (examinations of actual operations to quantitatively define weights and priorities under ranges of hydrologic and demand conditions, nonlinear operational decision models, and internal mass balance checks), to studies which developed quantitative links between hydrological conditions, ecosystem characteristic such as geomorphic processes and water temperature, and water operations. In addition, better understanding interdependencies between water supply, demand, and regional hydrologies would support more detailed scenario evaluation.

Performance Assessment

Indicators and performance measures are used to translate program goals and objectives into measurable benchmarks of program success. They present information on conditions, trends, and their significance. The immense scale of the CALFED Bay-Delta Program requires that a consistent protocol and a series of methodologies be developed to analyze the cumulative effects of restoration projects and water management actions. It is expected that the system of indicators and performance measures will evolve as knowledge of the Bay-Delta System responses to CALFED actions grows. But the indicators must also be sufficiently robust in the early stages to allow managers to assess progress and refine their actions as the plan proceeds. Thus, developing a system of indicators in the Bay-Delta Program will be an iterative process, whereby the initial indicators are constantly evaluated for effectiveness and expanded to include ancillary

explanatory data. At the same time new indicators need to be added as knowledge of change continues. The ultimate indicators that goals are being achieved (e.g. regional recovery of a fish population) may take many years to develop and/or may be difficult to interpret in isolation. Because many factors usually affect the ultimate responses, keeping track of the simpler and more local indicators is critical to show that success is possible (early in the program especially) and to substantiate claims of cause and effect as the program matures. Interpretation of indicators also requires understanding the baseline responses of the indicators—the responses and trends in progress before the program began.

The CALFED Program is in the unique position of having some environmental monitoring in place since, in some cases, the 1950s. Although additional large data needs remain, the historic data does provide some baseline information about the status of system before the Bay-Delta Program began. This large data set is an excellent resource for developing proposals on performance assessment across a number of programs or issues. Proposals that expand on the approach to developing performance measures listed on the CBDA Science Program web site, are also encouraged.



External Scientific Review Evaluation Criteria

Goals Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea is timely and important?

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?

Approach Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? 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?

Feasibility Is the approach fully documented and technically feasible? What is likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Monitoring If applicable, is monitoring appropriately designed (pre-post comparisons; treatment-control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Products Are products of value likely from the project. Are contributions to larger data management systems relevant and considered? Are interpretative (or interpretable) outcomes likely from the project?

Capabilities What is track record of authors in terms of past work? 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.

Bay-Delta Science Consortium Collaboration Evaluation Criteria

Why It's Collaborative Will the results of the collaborative effort be greater than the sum of its parts? Is it clear why the sub-projects part of a larger collaborative proposal rather than several independent smaller ones?

Interdependence and Integration Does the proposal have a conceptual model that clearly articulates each subproject and how they link together in a whole? Are the boundaries of the study plan focused, cohesive, and well-delineated? Are there clear plans for analyses and interpretations which seek to identify and quantify relationships among the data collected in various sub-projects rather than separate analyses for each sub-project?

Project Management Is it clear who will be performing management tasks and administration of the project? Are there resources set aside for project management and time amongst investigators to collaborate? Is there a process for making decisions during the course of the project? Is there a plan for potential differences in stages of sub-project completion times. Is there an acknowledgment of potential barriers to collaboration and an explanation of how team members will overcome barriers particular to their institution?

Team Composition Is there are lead principal investigator and does he or she have a successful management track record and experience leading collaborative teams? Is it clear that all key personnel are committed to making a significant contribution to the project? Do team members have complementary skills and a track record of working well on collaborative projects?

Communication of Results Is there a clear plan for comprehensive and cohesive reporting of project progress to the great CALFED community?