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July 31, 2008

To: John Kirlin, Executive Director
Delta Vision Blue Ribbon Task Force

From: Jeffrey Mount, Chair and Judy Meyer, Vice Chair
CALFED Independent Science Board

Subject: Organization of Science for the Delta

Please find attached recommendations from the CALFED Independent Science Board (ISB) for a new approach to delivering and administering science to support decision making in the California Delta system. This memo is the result of a workshop held in July by the ISB to evaluate the range of options for science and a Science Program for the Delta. The discussions of the ISB and the resulting recommendations were framed by the Draft Delta Vision Strategic Plan.

The Delta Science Program described in the attached memo represents a significant departure from current approaches to providing science. In order to improve efficiency and effectiveness, and to delineate clear lines of responsibility and authority, the ISB recommends that scientific activities be prioritized, and where appropriate, funded by a Delta Science Program that reports directly to the proposed California Delta Ecosystem and Water Council.

The ISB thanks you and the members of the Task Force for this opportunity to recommend an approach to reorganizing how science is organized and administered in the Delta system. If you need any clarifications or additional information, please do not hesitate to contact either of us.

Attachment

cc: J. Grindstaff
CALFED Deputy Directors
IEP Directors and Coordinators
BDCP Steering Committee

Recommendations for a Delta Science Program

CALFED Independent Science Board

Prepared for the Delta Vision Blue Ribbon Task Force

Introduction

Management of the Sacramento-San Joaquin Delta's linked ecosystems and water supply network requires a highly effective, well-funded, and integrated science program. Although current agency and university scientific programs have accomplished a great deal, their distributed, fragmented structure, challenged by rapid change in Delta conditions and erratic funding support, will be unlikely to meet the policy and management demands of the future.

> The purpose of Science in the Delta is to reduce risk, uncertainty and cost in making wise decisions for the long term future of the California Delta System.
>
> *Paraphrased from comments by Duncan Patten and Jason Peltier May 20, 2008*

For the past year, the CALFED Independent Science Board (ISB) has been reviewing elements of the scientific infrastructure that support policy and management decisions in the linked Delta system. Based on these reviews and a July 2008 workshop on this issue, the ISB has developed recommendations for reorganizing both the science to support decision making in the future and a Science Program to administer it. This memo outlines the recommendations of the ISB. The recommendations are framed within the governance structures contained within the current Draft Strategic Plan of the Delta Vision Task Force.

The conclusion of the ISB is that in order to increase efficiency and effectiveness of scientific programs, and to increase capacity to respond to rapidly changing conditions in the Delta system, the state and federal government should develop a Delta Science Program (DSP) that differs from current Delta science and monitoring efforts. This innovative and responsive program is described in detail below.

Mission Statement

The proposed Delta Science Program articulates and implements an interdisciplinary and inter-institutional scientific and engineering framework designed to advance understanding of the California Delta System, including its tributary watersheds and its water supply distribution system. Science and engineering overseen or administered by the Program are defined in the broadest context, including: the physical chemical, biological, and social sciences, public health and all branches of engineering. The Program will establish priorities for research and monitoring, improve understanding, reduce risk and uncertainty, inform operations, and guide assessment of performance. The Program will increase efficiency and effectiveness

of Delta research and monitoring programs through integration, targeted funding, and timely reporting and analysis.

The Science Program, led by a Lead Scientist with a broadly trained scientific staff, will be guided by the Delta Science and Engineering Board through periodic assessments.

Core Functions of the Delta Science Program

Multiple science and engineering activities are important for water and environmental management related to the Delta and its tributaries. To be successful, these activities, defined here as core functions, should be the responsibility of a Delta Science Program with sufficient authority and budget to carry them out. The effectiveness of the Science Program in assuring that these core functions are performed will be the basis of performance measures for the program. The Science Program's vision, design and structure must serve the needs of the region and the state, regardless of the institutional model that the region adopts at any particular time to manage and operate the Delta.

There are three broad categories of functions that will be the direct responsibility of the Science Program. The first, *Vision Function*, provides key guidance and linkages for all scientific activities. The second, *Programmatic Outcome Functions*, are the tangible programmatic products that inform decision making. The third, *Enabling Functions*, includes essential functions that embed into and improve the effectiveness of Programmatic Outcome Functions. An additional function, *Program Oversight*, will be conducted by an independent review board supported by the Science Program.

Vision Function

The Program is responsible for articulating and implementing a vision for an interdisciplinary and cross-institutional science program tailored to advance understanding of the California Delta System and to support management and decision-making. The vision will be guided by the principles set forth in the California Delta Ecosystem and Water Council's five-year plan. The Lead Scientist develops this vision in close cooperation with Program scientific staff, regulatory agencies, stakeholders and the Council.

Programmatic Outcome Functions

Science to Inform Policy - The California Delta System is undergoing irreversible change, with considerable uncertainty about the future. Well-funded, competitive grants and directed grants programs will be needed to anticipate and plan for change and uncertainty. Granting programs should support efforts that are process-based, should explain past cause-effect relationships and anticipate future challenges in both the short and long-term. Work should be broad in scope crossing

the boundaries between multiple disciplines (socio-economic, physical, biological and engineering sciences). In addition, these programs should promote and fund advances in technology that can improve information collection and analysis.

Integrated observation, simulation, and analysis – The Delta and its related complex water management system and ecosystem restoration efforts will be managed differently in the future. This will require collection and assimilation of new and accessible data, the development of new analytical tools, and the building, maintenance and upgrade of system-level public domain and open community models which can help guide management.

These efforts need to be sustained and integrated across multiple existing programs and new initiatives that are conducted by many institutions across the region and the state in order to inform effectively scientific and technical activities related to Delta management and policy. This information is essential for furthering our understanding of the California Delta System, early detection of trends, ensuring compliance with regulatory mandates, optimizing real-time management and ensuring this knowledge is transparent to all stake-holders.

Communication and Science Policy Integration - Interpretation and communication of current scientific understanding and new technical information to a diverse audience of policy and decision makers, scientists, and the public is a critical role of the Science Program. Direct and continuous communication with legislators, stakeholders and decision makers is essential. A comprehensive multifaceted and multimedia communication plan needs to be developed and implemented. In addition, experts need to be available to provide technical support and advice in a timely manner to decision makers on high priority issues. Experts will provide guidance and analysis for ongoing activities through standing advisory panels, workshops or other forums and will provide advice verbally and/or in writing. More in-depth support is provided through opportunistic or focused studies initiated by the Science Program in rapid response to emerging issues.

Adaptive Management Applications - Water management operations carried out by the proposed Delta Operations Team and ecosystem restoration efforts performed by the California Delta Conservancy will provide opportunities for learning about ecological and hydrological responses to system changes that can guide future decisions. This is the essence of adaptive management. For the foreseeable future, it is important that an organization track real-time and seasonal operations data along with the performance of ecosystem restoration actions. Integrating operations and restoration information and understanding is vital to management of the rapidly changing Delta system.

Enabling Functions

Science Integration and Coordination –In order to be effective and efficient, programmatic outcome functions must be integrated and coordinated at all times. These efforts will need to extend to the activities of state and federal agencies, universities and stakeholders as well. Integration poses a significant challenge to

any science-based adaptive management program. To be successful, the Science Program must have substantial authority over prioritization and funding of Delta-related science activities.

Assessment and Synthesis – Status and trends determination, performance evaluation and regulatory compliance assessment and reporting will be necessary to support all programmatic outcomes. A critical core function of the program will be to assemble, analyze and report these results in a regular, transparent fashion that can be easily understood and used by the Council and affiliated agencies. Equally important to this reporting is the incorporation of information into comprehensive strategic syntheses. These syntheses, developed or funded and directed by the Science program, involve the distillation of knowledge from a combination of assessments, theory, simulation, field measurements and experience. Synthesis should not be limited to the physical and biological sciences, but should also include socio-economic assessments.

Scientific review – Independent peer review should be the foundation for all aspects of Delta planning and implementation and a critical tool to help ensure that all decisions are transparent, unbiased, and sound. All programmatic outcome functions of the Program, along with activities of the Council and its affiliated agencies, should be supported by independent peer review.

Oversight Function

The Delta Science Program will be reviewed annually in order to assess its progress in meeting its fundamental mission goals and objectives and the overall scientific quality and effectiveness of the program. These reviews should be comprehensive and track performance measures based on the core science functions. Reviews should be conducted by the Delta Science and Engineering Board. The Board will be made up of 8 - 12 scientists and engineers with no direct affiliations to the Program or the agencies it serves. Board members will be recommended by the Lead Scientist and appointed by the Council. Following annual reviews, the Board will prepare a written summary of their assessment and recommendations for future activities, and present this information to the Lead Scientist and the Council. Under exceptional circumstances, the Board may respond to requests of the Council for advice on resolving high-level scientific controversies.

Delta Science Program Organization and Funding

In order to complete the core science functions as well as support the oversight function, the Delta Science Program will need to be well-staffed and well-funded. It is essential that responsibilities for fulfilling these functions be clearly assigned to specific staff members in order to increase efficiency and accountability. A summary of a proposed organizational structure is shown in Figure 1.

The Program will be headed by a Lead Scientist who is employed by the Council and reports directly to the Council. The Lead Scientist must be independent, with full authority over program priorities, budget and staffing. The Lead Scientist will be a nationally-prominent researcher with experience managing scientific programs. In consultation with the California Delta Ecosystem and Water Council, the California Delta Conservancy, and State and Federal agencies, the Lead Scientist will develop and implement Program plans and budgets.

The Lead Scientist will oversee and be supported by a Director who is responsible for overall budget planning and administration and for supervising the four Deputy Directors. The Deputy Directors will be responsible for each of the four Programmatic Outcome Functions of the Science Program. The Lead Scientist and team of Deputy Directors will be responsible for incorporating the Enabling Functions described above into all Programmatic Outcome Functions.

Deputy Director for Science to Inform Policy develops and funds fundamental scientific programs and strategic syntheses that seek to increase understanding of the Delta system to reduce critical uncertainties. This person will facilitate the establishment of annual research priorities, manage the grant and fellowship programs, and oversee the development of informational science and technology workshops.

Deputy Director for Integrated Observation and Simulation Systems coordinates, guides and allocates funds to environmental monitoring programs for status and trends assessment, regulatory compliance, and performance evaluation along with data assessment and reporting. This person will direct and fund Delta system data collection, archiving, analysis and dissemination, including the management of system-scale models and the incorporation of new technologies.

Deputy Director for Communication and Science-Policy Integration will design and implement holistic multifaceted communication strategies between the Science Program and managers, policy-makers, scientists, and the broad stakeholder community. This individual ensures that the Science Program meets policy and management needs.

Deputy Director for Adaptive Management Applications works with the proposed Delta Operations Team to support science and engineering efforts to learn from and improve water supply and environmental performance of water export operations. In addition, this individual works with the California Delta Conservancy to provide focused scientific advice and review for ecosystem restoration program planning and implementation.

The Council will select the Lead Scientist by appointing a search committee, made up of agency, university, and stakeholder scientists, who will recruit viable candidates and make a hiring recommendation. The Council can choose to accept

or reject the recommendation, only. The Delta Science Program Director will be hired by the Lead Scientist with advice from Science Program and agency staff. The Lead Scientist and Chief Deputy Director will recruit and hire the Deputy Directors.

The Science Program requires a statutory exemption to contract with independent scientific experts to support the Council without regard to the Department of General Services competitive bid requirements. In carrying out the mission of the Council, the Science Program will be expected to provide timely, necessary and relevant scientific guidance within very short time periods. This requires frequent, short time frame engagement with nationally prominent scientists who have the specific expertise needed to address critical Delta management issues. The expert exemption will provide the Science Program with the mechanism to ensure provision of useful scientific information when it is needed.

Funding

The Delta Science Program will be responsible for funding, guiding and assessing science and engineering efforts to improve the performance of ecosystem and water management operations in the Delta. Most of the expenditures will be outside of the program through contracts to agencies, non-governmental organizations, consulting firms and universities, but with technical and scientific oversight and guidance from the DSP. Sustained and reliable funding is needed for these activities. Past experience has shown that relying on federal and state agency operating budgets and state bonds to fund this activity distorts priorities and produces boom-bust cycles in funding that damage the quality and effectiveness of science and monitoring programs. The DSP should be funded entirely by a stable, long-term fund source, such as water user fees or some other mechanism, to improve resource availability and predictability.

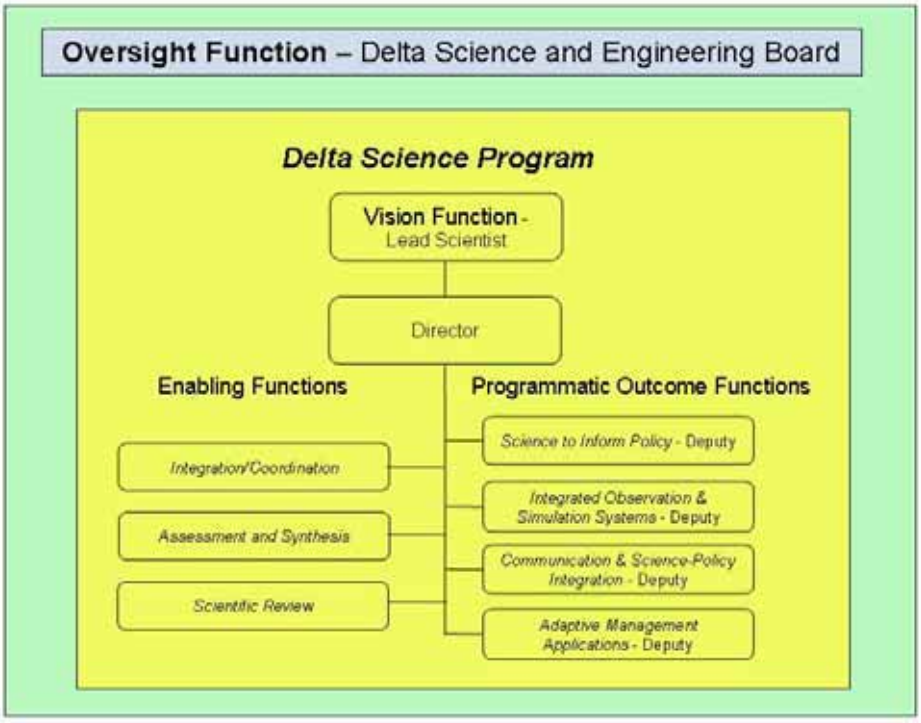

Figure 1. Core functions and staffing for the proposed Delta Science Program. The Program would report to the California Delta Ecosystem and Water Council.