CALFED Science Program
Scope and Functions

Purpose and Scope of the CALFED Science Program

The **purpose** of the CALFED Science Program is to provide a comprehensive framework to provide new information and scientific interpretations necessary to implement, monitor, and evaluate the success of the CALFED Program. An overriding principle of the Science Program is adaptive management. New information and scientific interpretations will be used to confirm or modify all aspects of the Science Program, including problem definitions, conceptual models, research, and implementation actions.

The **scope** of the CALFED Science Program will provide scientific information for the CALFED Program as defined by the EIS/R. While all the CALFED Programs will have a science component to address areas of less certainty, some programs such as the ecosystem program strongly rely on an adaptive management science program. In addition, the information from the CALFED Science Program should be used by other related state, federal, local and nongovernmental actions/programs in the CALFED solution area. This includes other ecosystem restoration, water quality, levee and water management activities both regulatory and nonregulatory, including water project operations.

The CALFED Science Program has made significant progress in recent years as the CALFED ecosystem restoration program has been developed and implementation begun. Agencies and stakeholders have participated in the development of ERP conceptual models, indicators of success, and the use of independent science review. All these ERP activities are all critical components of a Science Program. CALFED is now turning its attention on the establishment and implementation of a Science Program for all areas of the CALFED Program, and for related activities.

Functions of a CALFED Science Program

1. Independent Science Review.
   - Provide independent science review for the scientific aspects of the CALFED Program and related programs, (including the overall CALFED program and individual programs such as the ERP, Environmental Water Account, and water project operations). Convene independent science panels and boards to advise in the development, implementation, and results of the Science Program. Obtain peer review of published findings.
   - Independent Science Review is needed for evaluating the basic underlying

assumptions and process of the CALFED Science Program as well as evaluating the success of the programs and actions

- Independent Science Review is important to assuring quality and maintaining public confidence in the program

2. Science Planning and Priorities.
   - Develop broad science priorities to guide monitoring, research, and trial implementation actions. The priorities will support the scientific information needed to make management decisions during or at the end of Stage 1. Priorities and planning will be integrated across program elements, and developed with independent scientific review, agency and stakeholder input, and coordination among program managers. Priorities will be submitted to Policy Group or a CALFED commission for approval.

   - Review and, if necessary, refine science based performance measures and indicators for each program on an ongoing basis to ensure the CALFED Program is effectively measuring and reporting on the program success.

3. Monitoring.
   - Conduct monitoring to provide information to assess progress towards meeting goals and objectives of CALFED. Monitoring will be done at several levels:

     --System-wide status and trends (baseline) of the Bay-Delta and watershed -- This monitoring helps identify long-term changes occurring as a result of human and natural factors.

     --Regional level -- This monitoring helps identify changes occurring on a regional level as a result of human and natural factors. This monitoring will provide data to assess the achievement of regional objectives and targets.

     --Individual projects and actions -- This monitoring helps determine if objectives of the project or action are being accomplished. This includes monitoring for enhancement actions and compliance monitoring as part of mitigation requirements. Monitoring for groups of similar projects /actions will be coordinated to provide information broader information on effectiveness of certain projects/ actions.

     --Real-time monitoring for water project operations -- This near real-time monitoring of the presence of fish near the project pumps provides operators with data to adjust operations to protect fish and maintain water supply reliability.

- Develop monitoring protocols for all types of monitoring to ensure data consistency for each category of project/action. (Comment --provide further detail??)

4. Data Management.
   - Develop and maintain a public online coordinated and linked system for the monitoring data and other relevant data. The data in the database will be used for comprehensive analysis and reporting and will be available to agency and nonagency scientists. Data will be subject to quality assurance/quality control protocols. Data will be made available when needed for assessment and reporting requirements.

5. Assessment.
   - Perform data analysis and interpretation of the raw data generated in the monitoring programs in order to evaluate the overall performance of the CALFED Program. The data analysis and interpretation will be subject to independent peer review.

   - Provide scientific judgements as necessary in order for decision-makers to make program decisions. The assessment will detect:

     --System-wide trends of program indicators
     --Regional level trends and responses of indicators
     --Project level responses of indicators
     --Real-time trends of indicators relevant to water operations

6. Research.
   - Manage a focused research program that targets key scientific uncertainties related to program decisions. Research priorities will be based on the science priorities described above (Function #1). The purpose of the research program is to determine how consequences of actions happen, while the monitoring program describes what consequences happened. Gaining an understanding of how trends changed or why projects resulted in certain consequences is a critical element of the adaptive management process.
   - Develop and refine conceptual biological and mathematical models that link important causes and effects.

7. Trial Implementation Actions (pilot and full scale).
   - Provide advice on the design and execution of trial implementation actions. A trial implementation action is one in which there is some level of uncertainty on the effects of the action, but the level of knowledge and information supports trial

implementation. Trial actions are a partnership between science, management and the public. Trial actions will follow scientific principles and processes. Depending on the level of knowledge and information available, trial actions may be designed as pilot actions or full scale actions. Data from the trial actions will be assessed and reported as part of the Science Program and adaptive management process.

8. Reporting.
   - Disseminate scientific information, including opinions, data, models, and findings, to state and federal agencies, scientific community, general public, stakeholders, and decision-makers. The scientific information will be converted to useful information for policy level interests and decision-makers and disseminated through published reports, scientific articles, briefings and conferences. Findings will be provided for all levels of monitoring (system-wide, project level, and real-time) and from focused research. Reports should also be provided to regulatory agencies which summarize scientific knowledge for use in regulatory management decisions.

9. Coordination and Integration.
   - Coordinate science functions and actions performed between the CALFED program elements (ERP, Levees, Water quality, and water management).
   - Coordinate with all other science programs (IEP, CAMP, SFEI) that are based in the Bay-Delta and its' watershed. When appropriate, existing science programs and the CALFED Science Program will be integrated to increase the usefulness of the data generated and reduce duplication.
   - Coordinate with related programs (such as CVPIA actions, regulatory programs, water operations) to assure that related programs use the science information in their management decisions. Related programs should provide input into all functions of the Science Program to assure the use of the information by the related programs.
   - Provide for public involvement in the development and implementation of the Science Program.

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