

# Water Quality Review

Draft by Tracy Collier and Elizabeth Canuel

Water quality in the Delta is the subject of intense discussion, and often disagreement. Water quality affects myriad aspects of the Delta, including ecosystem processes, drinking water supplies, and agricultural uses. Water agencies desire high quality water, which can potentially result in lower quality water left in the system. The issue of balancing water quality within and outside of the Delta will be amplified if water intakes are moved north, from the San Joaquin to the Sacramento portion of the Delta. The scientific basis for how water quality is measured and used in managing Delta water supplies and exports is the primary focus of this ISB review.

We propose to obtain information from the major agencies that measure water quality in the Delta. Examples include:

- Department of Water Resources
- IEP
- USGS
- State Water Resources Control Board
- USEPA
- CalEPA

We plan to gather information from these agencies, including the following:

1. Water Quality variables that are measured routinely (we will first need to define what we mean by WQ).
2. Water Quality variables that are not measured routinely but should be, and is there a process for determining what water quality data are collected?
3. How are water quality data used in management decisions in the Delta?
4. Availability of data and analyses to scientists and the public?

## **Delta Levees**

Draft by Brian Atwater and Richard Norgaard

Reviews of Delta science programs could include one focused on the Delta's levees. Treated broadly, levee science would include:

1. Histories of diking, failures, and subsidence
2. Engineering geology of levee foundations and materials
3. Monitoring of levee heights and slopes
4. Assessment of hazards posed by floods, sea levels, earthquakes, burrowing animals, and levee failure on an adjacent tract
5. Assessment of benefits and costs of levee protection
6. Emergency preparedness and management
7. International perspectives

## **Water reliability – review of scientific and technical activities**

Draft by Jay Lund

Water supply reliability is one of the co-equal goals for managing the Sacramento-San Joaquin Delta. The Delta's central role in supplying water to the Central Valley, Bay Area, and Southern California makes this goal quite far-reaching.

A wide range of local, state, federal, and NGO technical and scientific programs are directed to analyze water supply reliability. Perhaps the most public effort is the DWR biennial report that estimates the delivery reliability of the State Water Project. Other agencies routinely provide long-term and seasonal operations planning estimates of water delivery reliability.

A review of scientific efforts to estimate and evaluate water supply reliability might include:

- An inventory of major long-term and seasonal estimation efforts undertaken by various federal, state, and local agencies.
- An evaluation of the methods, data, and uncertainty involved in making such estimations.
- The management responses available when reliability is imperfect, and their costs.
- Approaches being taken to estimate changes in reliability with changes in climate, endangered species conditions, and alternative water supply and conservation infrastructure and management.
- Opportunities to jointly manage water for both water supply and ecosystem purposes.
- Other items?

This probably can be a short initial review that might suggest some areas for further work, agency coordination, and perhaps reporting back.

# **A Preliminary Proposal for the Review of the “Science” Underlying the Processes Affecting the Delta as Place**

Draft by Richard Norgaard and Brian Atwater

## **Summary**

The Delta Stewardship Council and other policymakers need better ways of understanding the nature of, and the processes affecting, the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place. A “scientific” review of both the state of knowledge and of the institutional setting and needs for maintaining and generating new knowledge falls within the legislative mandate of the Delta Independent Science Board. To undertake this review effectively, the review will need team members with local institutional expertise and scholars in the social sciences and the humanities that the DISB lacks.

## **A Proposition.**

The natural sciences can provide historical material on the biophysical environment within which the cultural, recreational, natural resource, and agricultural values have evolved as well as outline the nature of possible biophysical futures. Lund, et al (Envisioning Futures, 2007) provide an excellent example of possible biophysical futures. The values themselves, however, have developed through sociocultural-environmental processes that are best understood with the help of scholars in the social sciences and humanities. Since the DISB is composed almost entirely of natural scientists, and it is not only the natural sciences that inform better policy decisions, the DISB will need the help of expertise from the social sciences and humanities.

There is, to some extent, a social science of the Delta as Place. More social science research is surely needed to assure that the coequal goals are met within the constraint of protecting and enhancing the Delta as Place. The humanities also have helped elaborate the meaning of the Delta as Place and more research would be helpful. Ultimately, however, understanding the Delta as Place will also entail more fully interdisciplinary research with the participation of natural scientists.

# Delta Independent Science Board Review of Adaptive Management Programs

Draft by Tracy Collier, Jay Lund, Lauren Hastings, Vince Resh, and John Wiens

The Delta Reform Act assigns adaptive management a central role in implementing programs to achieve the co-equal goals. However, aside from implications that management of the Delta should respond to changing scientific knowledge and conditions, very little is specified about how adaptive management should be implemented. Successful adaptive management will require a flexibility and focus among the many specialized agencies and science activities involved in the Delta. Achieving this goal will require dedicated expertise, resources, and governmental authority, as well as effectiveness in working together across science, management, and regulatory functions.

The Delta Reform Act calls for the DISB to review the development and application of “scientific research, monitoring, and assessment programs that support management of the Delta” every four years. To meet this requirement in a regular and timely way, the DISB needs to collect information on how local, state, and federal agencies and institutions develop and use science to support adaptive management. To do this, we propose that the DISB, with support from the Delta Science Program:

- develop a draft template for requesting information from each agency involved in science and adaptive management in the Delta and discuss the draft template with agency staff;
- modify and finalize the template for requesting information to support the DISB’s review and establish a time line for such a review;
- DSP staff use the DISB-approved template to collect information for the DISB;
- DSP staff compile the collected information, noting major gaps or misinterpretations of the DISB request;
- deliver the results to the DISB for review.

The objective is to have 1-10 page summaries for each agency or program, documenting their science programs and how they employ adaptive management.

Components of the template for requesting information could include:

- Is there a document describing how adaptive management is being, or should be used? If yes, provide examples or links. Does it mesh with framework for adaptive management in the Delta Plan?;
- Is there a science plan? If yes, provide links to it and provide a short discussion of how it is being used and how it fits with adaptive management;
- Is there a documented process for science-policy or science-management interactions? If yes, provide links and indicate how it is being used and how it fits with adaptive management plan(s);
- If you collaborate with other agencies or institutions in implementing or supporting adaptive management, provide links and descriptions of those interactions;
- Provide a self-critique of the actions of your agency/institution in supporting adaptive management. Describe successes and identify factors that limit your ability to conduct or support adaptive management.