

Draft memo

To: Organizers of the Bay-Delta Science Conference of 16-18 October 2012

From: Delta Independent Science Board

Subject: Accolades, suggestions, and further comments on the 2012 Conference

Members of the Delta Independent Science Board praise the conference and offer suggestions for making the next conference even better.

The entire Board was on hand for at least one of the three days, and nearly all of us were there throughout the conference. Nearly every session was attended by at least one Board member. We chose presentations partly for the relevance to our current task of reviewing ecosystem restoration in relation to climate change. But we also chose presentations because they were near (or sometimes far) from our individual specialties. We discussed the conference during our public meeting of 19 October.

Most importantly, we believe that this conference is of the highest priority for regional scientists, and they should to be encouraged to participate in. We found the conference to be at least as informative as most major national and international gatherings. We liked its size and duration, its topical variety and focus, and its opportunities for scientific communication and collaboration. Engagement with the arts community further enriched the program and provided a perspective on the Delta that many of us do not often stop to consider. Those who had attended previous Bay-Delta conferences noted the growth in scientific knowledge and examples of scientific synthesis that are taking place in the Delta research community.

Our suggestions for future conferences are summarized below. Additional observations follow from John Wiens, Ed Houde, and Joe Fernando.

SUGGESTIONS

In view of its broad benefits to Delta science, make the conference an integral part of the Delta Science Plan, which is currently in preparation.

Encourage substantial participation by state agencies involved in Bay and Delta science and policy, as both producers and consumers of the information presented at the conference.

Increase the percentage of presentations or sessions that address “grand challenges”.

Presentations in this mode in the 2012 conference included overviews of BDCP, adaptive management, and the historical and potential future Delta. These presentations were well attended and sparked lively discussions, both in the sessions and in the corridors

Begin as many sessions as practical with invited talks that introduce the session topic in a comprehensive manner that is understandable to a broad audience. As an example, such a talk led off a fish life-cycle session.

Include more policy talks in sessions suitable for them, as a way of focusing the science discussions on application of the science.

Expand the coverage of engineering issues, especially those pertaining to levees and pipelines.

Include more coverage of global scale forcings on the Delta. Examples of talks that addressed this include presentations by Mike Dettinger on atmospheric rivers and Fred Feyrer's presentation about regime shifts in the Pacific Ocean and effects on fish.

Offer evening sessions with overview talks for the public.

Consider inviting the local press as well as representatives from publishers of high visibility journals such as Science, Nature, etc.

Request that all presenters put their findings in context, in part by requesting each abstract to contain a statement of broad implications for policy or management issues facing the Bay and Delta. Use such a statement as part of the abstract evaluation and session placement process.

Experiment with new options for the poster presentations. Some of us recommend increasing the proportion of poster presentations, especially if presenters are allowed to introduce their topics very briefly during related oral sessions. Another of us found the existing number of posters excessive. We also discussed concern that an agency might deny a poster presenter permission to attend the conference on the grounds that posters are often seen as not equivalent to an oral presentation. Posters are an effective method of presenting scientific information and should be valued.

ADDITIONAL COMMENTS from John Wiens

Science presented at the conference poses formidable challenges on how to use science to advance the co-equal goals of reliable water supplies and restoration of ecosystems.

A huge amount of data and information is being generated. As the data and information become available more and more rapidly, our thinking and focus are inevitably pushed and pulled in various directions (“follow the data”). Left unattended, this can exacerbate the fragmentation and siloing of science efforts that is already a major problem. There is a need for correspondingly rapid synthesis and sharing of this information. This requires communication, but it is too easy to toss about the word “communication” and think that will solve the problems. What is really needed is closer *collaboration* among scientists and projects addressing similar issues. This is essential if adaptive management is to be comprehensive and effective rather than problem- and project-specific. To do this will require dedicated funding, up front.

There were lots of presentations about modeling, which is great. Understandably, most of the modeling was quite situation-specific and detailed. It is an unfortunate fact that as models become more sophisticated they become more detailed, requiring more data, which requires time and money. Consideration should be given to *adaptive modeling*—starting broad and general and building in detail as needed (but no more than is needed to address the goals and objectives).

Goals and objectives need to be coordinated across projects. Many presentations reported on similar things, but the goals and objectives (when stated) often differed, at least in subtle ways. This compromises the net benefits of the studies.

It is apparent that careful attention must be given to how science should be organized as the various plans begin to be implemented. There is a risk that, because BDCP will of necessity be developed through a process of negotiation and compromise between permit applicants and permitting entities, the resulting framework may place constraints on the problems science is asked to address. Science coordination is essential, but it must also be independent. This is especially important when it comes to evaluating the design, implementation, and results of adaptive management. The broad array of projects and groups bringing science to bear on issues in the Delta was apparent at the conference, highlighting the need for better, broader coordination.

It was gratifying to see climate change and sea-level rise figure so prominently. Incorporation of these effects into science projects is still in an early stage; better coordination of efforts right now could have significant pay-offs in the future.

There was lots of talk of “resiliency” and “reconciliation.” We all should be wary of making the mistake of thinking that labeling something means we understand it.

ADDITIONAL COMMENTS from Ed Houde

Overall, the conference was excellent and provided a nice opportunity for the many scientists and managers engaged in Delta research to present and communicate progress on diverse science programs. The conference was focused on Delta issues and in that respect is a local event, but the scope and breadth of presentations were on a level of national and international conferences. The science community addressing Delta problems obviously is engaged and the conference was both a venue to inform the community of progress and to network with colleagues.

I only attended the last two days of the conference, thus missing the opening session, plenary talks, and the town hall meeting. Still, I managed to hear many presentations and had discussions with several young scientists at the poster sessions. Overall,--a very positive impression.

There was strong evidence of very effective development and application of new technologies in fisheries ecology and science. Genetics, otolith chemistry and microstructure, and acoustic tagging and tracking are being used innovatively and successfully. In several presentations, a combination of these methods was used to define life history traits and variability, to track migrations (in real time in some cases), and to determine how variability in the Delta system and waterways affected production of salmonids, and both delta and longfin smelts. These technologies were being applied to wild and hatchery fish and in some cases (for salmon) were used to interpret life history traits and variability from above the Delta to the sea.

The uses of otolith microchemistry and genetics methods have matured in the past decade. Otolith chemistry presentations of note were that by Hobbs on delta smelt--he demonstrated that there are contingents of delta smelt, some of which never leave freshwater; by Weber on winter- and spring-run juvenile chinook salmon, revealing very different use of Delta rivers, tributaries, and waterways by the two stocks--spring-run juveniles spend very little time in the Delta in contrast to winter-run fish; and by Johnson (a former Delta Science Program Fellow) who showed how in-Delta and at-sea differences in the environment and system productivity affected growth, survival, and year-class strength of chinook salmon. Fisch's (a Delta Science Fellow) presentation on "hatchery management" was actually a nice overview and evaluation of the compendium of genetics approaches now available for use of hatchery fish to address restoration and ecology questions.

Life-history modeling presentations were represented at the conference, but probably not to the extent that they could be, at least from my sampling on the two days I participated. This approach is essential to understand what elements of the Delta ecosystem are critical to restore to support native fishes. A presentation by Rosenfield and Nobriga on longfin smelt population control and regulation was a nice example of application of multivariate statistical modeling, combined with stock-recruitment modeling to describe and predict population behavior and factors that promote success. This approach has potential to develop forecasts of abundance.

Most of the talks I heard were quite focused on particular problems or issues and many of them were by young scientists and students. There were also many talks on methods and

methods development. Some of these would have been better as posters. Still, affording young scientists the opportunity to make oral presentations before a large audience is to be commended.

There were presentations (and theme sessions) that took a broader view of Delta science. One good example was Feyrer's presentation on 30-yr trends in fish communities and assemblages from the Delta to the sea in which he demonstrated that fish communities respond to environmental factors acting on multiple scales. He found that the POD is a phenomenon not confined to the Delta but with effects registered throughout the San Francisco Bay and Delta, and related to watershed factors, freshwater flow, and ocean climate variability. Interestingly, the POD trends seen for pelagic fishes were not apparent for demersal fishes, although the demersal fish communities did shift and vary at multiple scales.

I thought that Earle's presentation on factors affecting ability to achieve goals and objectives for the BDCP was an excellent overview of the major problems and possibilities for success. He commented that some BDCP goals and objectives may be unrealistic because of the Delta's spatial scale. For example, he questioned whether restoration activities and projects centered in the Delta would be effective when juvenile salmon spend as little as two weeks of their lives there. (Note: It would be good for the Delta Science Program to obtain Chris Earle's .ppt presentation for reference)

I heard "adaptive management" mentioned by many presenters, mostly as a goal or objective. That in itself is good news. The concept and need for adaptive management and science to support it is instilled, which is an important first step.

While the examples of integrative and synthetic science were not as common as desirable, there has been an increase in these activities over the past 15 years. When I first was a member of the Science Advisory Group to IEP in the mid-1990s, we commented incessantly about the near complete lack of integrative/synthetic science in the Delta and Bay science programs. The situation is improving.

I believe the conference theme sessions could be improved by some restructuring. An invited leadoff presentation (perhaps 25 min) on each theme topic that is an overview with an integrated/synthetic approach would be welcome. The invited presentation could be followed by 15-min (rather than 20-min) oral presentations. Reduction in numbers of oral presentations on relatively routine methods or methods development might be beneficial, although some "methods breakthroughs" clearly would interest a listening audience.

In a discussion with me, one of the Program Chairs indicated that he thought it would be a good idea to broaden the scope of the next Delta Conference to involve, in a limited way, scientists, and science from other estuarine systems in the U.S. and globally. I mentioned this idea to several people at the conference and mostly received a negative response. The Delta Conference serves a unique need to showcase Delta science and to highlight problems and solutions. Most people would not want to dilute that emphasis by expanding its scope.

ADDITIONAL COMMENTS from Joe Fernando

I attended the conference only on Thursday October 18th because of prior commitments.

It appeared that the Salt Pond Restoration project is progressing well, and the presentations delineated the localities where erosion of mudflats and sloughs occurs due to modification introduced by restoration. Sediment dynamics of restored ponds were addressed, including the role of wetlands. The work is clearly in progress and hope more complete results are forthcoming soon. A special session on this project, including science goals and how they are being addressed by different groups over the project life, would be very useful to evaluate the project progress.

I attended some modeling sessions, and paid attention to the use of UnTrim-Bay and EFDC delta models and the modeling of hydraulics of expanded floodways. I was impressed how the modelers have been attempting to combine flow, biology and chemical components, which is not an easy task. As with my previous experience on Mississippi River delta, there are a large number of models available or being developed, leading to the natural question: how many models do we need? - More the number of models, the better it is for the community as different models lead to better stochastic modeling capability, but I believe a model inter-comparison project to document the performance and competitive advantage of different models should be conducted; Are these models thoroughly validated? -- It seemed they have not been validated to the extent the users may desire, mainly because of the lack of data; and, Can the Delta Science Program be of help in streamlining modeling efforts? -- my impression is Yes, provided that a well thought out intercomparison strategy and a high quality benchmarking data sets can be established. In addition, one and two dimensional models have been compared in some of the talks, but evaluation against multiple data sets cannot be overlooked.

I may have missed out on this by not attending the first two days, but several plenary talks on broad science issues vexing delta science – physical, biological, chemical and geological - are needed to be given by internationally renowned experts. What has been mainly achieved during the two years prior to the conference ought to be emphasized, in the backdrop of critical issues. An assortment of talks on delta science activities are well and good, but the leaps of understanding can only come when different components are placed in the context of broader picture and overarching problems. I enjoyed several talks on integrated science and management, although they tended to have disciplinary bias, which is natural.

The panel on communicating science to the public was a nice complement to science talks, and I enjoyed it. I would have really liked a broader discussion beyond focus on a single project/dissemination-outlet. During the next conference it will be good to invite a science journalist from a reputed journal such as Nature or Science to the panel. They are experienced on multiple fronts and projects and hence may offer valuable advice. Exposing them to Sacramento delta may also help future visibility of the science program.

Finally, I attended several talks on adaptive management, but they had an academic and discursive twist rather than tackling real problems of delta. Although this concept has been alive for some time, but I am yet to see a good example of its implementation to management of an active delta (maybe I missed some of the relevant talks?).