Delta Independent Science Board Meeting
February 11 - 12, 2016

Thursday February 11, 2016
2nd Floor Conference Room, Park Tower
980 Ninth Street, Sacramento, CA

Delta ISB members present: Jay Lund, Steve Brandt, Richard Norgaard, Tracy Collier, Joe Harindra, John Wiens, Brian Atwater and Joy Zedler; Liz Canuel (via teleconference).
DSC/DSP staff present: Lauren Hastings, Kelly Souza, John Ryan, Jessica Davenport, Megan Brooks, and Dan Constable.

1. Welcome and Declarations (Lund)

None of the Board members present had any changes in status or conflicts to disclose.

2. Delta ISB Chair's Report and Business Matters (Lund)

The Board has a full agenda over the next day and a half, beginning with walking through an example performance measure (Spring Pulse Flow) to demonstrate the process used to propose refinements and updates to Delta Plan performance measures. Informal afternoon meetings will discuss panel development, review approaches and roll-out strategies of existing reviews, as well as proposed review topics such as Science Integration and Delta Monitoring Activities. Members of the public are welcome to attend.

3. Review of the process for Delta Plan Performance Measure Refinements and Updates (Jessica Davenport and John Ryan)

Delta Stewardship Council (the Council) staff are here today to present additional details that will help address Delta ISB- suggested improvements identified in its January 29, 2016 draft review response letter. Staff has already performed an assessment of the measures and will be presenting a set of refined performance measures with metrics, baselines and targets, to the Council for adoption at the February 25, 2016 Council meeting. Once adopted, the Gathering & Analysis (step 4) will begin and staff will prepare for tracking and reporting.
The Spring Pulse Flow measure evolved from a very broad measure in the Delta Plan, to something with more specificity that is easier to implement. It addresses one of the strategies in the Ecosystem Restoration chapter of the Delta Plan, create more natural functional flows.
The methodology for developing and refining performance measures involves 5 steps. Steps 1 – 3 are where a lot of the heavy-lifting occurs. Step 3 culminates in the completion of the performance measure specification sheets, which is regarded as the "ticket to implement." By this step, most of the key elements and attributes needed for performance measure implementation have been gathered and documented.
The collaboration with other working groups (e.g. Healthy Streams Partnership, San Francisco Estuary Partnership), Departments, programs (e.g. Interagency Ecological Program, Environmental Monitoring Program) plans (e.g. Central Valley Flood Protection Plan, Delta

Science Plan), units, research groups, planning and data resources (e.g. California EcoRestore, State of the Estuary Report, Delta Landscapes Project) is extensive.

A "strategy alignment rating" and "implementation rating" was conducted on each performance measure. In the implementation rating, performance measures were evaluated based on readiness (whether the measure need a small or large amount of refinement) and feasibility (whether the measure was of low or high complexity). In the strategy alignment rating, performance measures were evaluated based on the following questions:

- Is the performance measure useful?
- Is the strategy evaluated by a performance measure?
- Is the goal adequately evaluated?

The end product is a total average score. Collier pointed out that a highly complex measure does not necessarily mean that it has low feasibility (i.e. complexity doesn't inhibit feasibility). Davenport clarified that from a scientific perspective, he was correct. However, the term "complex" is being used in the context of the process, and not the measure itself. For example, from a staff capacity perspective, things like acreage restored were selected since tracking acreage is something that is easy for staff to collect and display quickly.

Wiens pointed out that the number selected for the strategy or implementation rating score is quite subjective; using a total average score than gives equal weight to all the attributes being evaluated. Wiens asked if there was any thought to conducting a sensitivity analysis that would weight attributes (e.g. maybe a particular performance measure is more sensitive to improved water quality, than a different measure). The ratings were conducted by internal and external subject matter experts, executive staff, Science Program staff, and others. Collier suggested documenting how the scores were arrived at, especially where there were differences of opinions. Atwater asked if there were any loop-closing efforts between steps 3 and 4, in which staff correspond with external subject matter experts to ensure that the partners engaged during the refinement are in agreement with the final measure. Staff offered that the specification sheets could be the tool used to get agreement from collaborators. Lund suggested having the partners "sign off" on a performance measure, or "sign off with concerns", so that it is explicit about who has or has not agreed on each performance measure, or where they have concerns within the performance measure. This would hold stakeholders accountable instead of having consent by neglect, and be helpful when it comes to implementing the measures since staff would already know who has what concerns.

Dan Constable reviewed each of the sections within the performance measure specification sheet (component attributes, basis for selection, sources of information, process, notes, presentation reporting, assumptions, conclusion and references). He explained that today's discussion is not to debate content, rather focus on whether the documentation is at the appropriate level, and whether staff are taking the correct approach.

Zedler pointed out that on page 11 of the specification sheet, the key question is very broad yet the answer is very specific. She thinks the question should be more attuned to the answer being provided. The question implies that the answer will address "meeting human demand" but it does nothing of the sort.

Brandt noted that the specification sheets are helpful because they demonstrate how the metrics were derived, compared to the tables shared with the Delta ISB in December 2015. However, he wanted to reiterate a notion that Atwater alluded to earlier, which is that similarly

to writing a manuscript, there is a peer-review of the draft product. Davenport noted that a decision about peer-review has not been decided and added that some of the performance measures don't rise to the level of peer-review (i.e. measures with level scientific basis), the way that the spring pulse flow measure does.

Wiens mentions that the process is well-described, intensive and detailed. From an ecologists perspective though, what you're interested in is the outcome, yet what you're measuring (mostly) is output. Are the output measures able to tell you what you need to know about the health and integrity of the Delta? Are you measuring something relative to the desired outcome?

Collier still has concerns about the level of documentation. Two years from now, will you be able to describe the selection of this set of performance measures? Outcomes aside, you may get push back on whether outputs are achieved, so documenting who had which concerns will go a long way towards establishing accountability in the future when personnel changes, for instance.

Lund suggests adding a page about interpretations. Given the concerns that some people may have when they "sign off" on these measures, it may help to have a range of numbers in some instances. In the same vain, Zedler recalled that there is tremendous pressure to accept that a project complied. If there was a way to share in the responsibility of the decisions made, this pressure might be reduced. She also shared two other ideas that would help reduce the pressures of finding project compliance:

- Adding a disclaimer that gives the benefit of the doubt to the resource and not the process, and
- Asking the Delta ISB to consult in contentious instances when a performance measure is being evaluated for compliance.

Norgaard asks who within the agencies would have the authority to "sign-off" on performance measures and what would it mean? He suggests a more palatable way to implement that notion would be to have a list of agency staff who were consulted on the matter, as opposed to "signing off." Davenport clarified that the idea of having agencies "sign-off" on performance measures is not something that has been considered before today.

Lund asked for an example of a "process-risk." The Delta Protection Commission's (DPC) Economic Sustainability Plan (ESP) was relied on heavily for performance measure generation in Chapter 5, Delta as Place. The Commission is struggling to find funding to update the ESP, thereby creating risk is that the Council would not have data to evaluate whether Chapter 5 performance measures were achieved.

Wiens observed that performance measures which are robust and operationally-useful are an effective way to mount an argument for sustained monitoring funding for the Bay-Delta system; being tied into the Delta Plan lends even more credibility. There ought to be a way to circle back and assess how well performance measures would fit into an adaptive management process…so that the process of developing performance measures is not independent of developing adaptive management.

Public Comment from Erik Ringelberg (Local Agencies of the North Delta)

Slide 7 of Revised Presentation

- How did staff arrive at 10, 20 or 30 for 'Strategy Alignment Ratings"? A table explaining the criteria associated with each score would be helpful.

- This structure is useful but leaves a lot of questions. For instance:
    - Strategy 3, Improving water quality to protect the ecosystem. What is the temporal range? Short-term pulsed water quality is frequently and significantly worsened by flushing sedimentation into the system (temporal scale matters). Are you improving water quality over a year, or for the immediate purposes of the fish?
    - Strategy 4, Prevent introduction of and manage non-native species impacts. Pulse flows are not strongly correlated to preventing or managing non-native fish species so this is not a good metric.

Slide 9 of Revised Presentation

The system is highly regulated, both by law and the Freemont Weir. Comments on the:

- Metric - One spring flow event 5 to 10 times winter base flow is already required by law. This analysis isn't needed since that criterion is readily met.
- Baseline - Where you measure flow is important. Retrieving hydrograph data from a "USGS stations below Shasta" is vague and where you measure it matters.
- Target - Ringelberg encourages the addition of ecological relevance by articulating why one spring pulse flow event is sufficient, versus multiple spring pulse flow events of varying sizes. What does the literature support?

Page 12 of Specification Sheet

- The conceptual model has no connection back to increased fish attraction, cottonwood viability, sediment transport or any of the items that are as measured as outcomes from this process.
- Ringelberg feels that using Putah Creek is an illustration of how not to do this. That system is even more regulated, and a result of 15 years of litigation. What this performance measure seeks to do is bring back natural flows into a system with limited resources, not enforce the same court-ordered flow event each year.

Collier noted that Ringelberg's comments were germane to Council staff rather than the Delta ISB, which only reviewed the process. However, it speaks to the types of comments that the Council will receive down the road, which supports previous Board recommendations to expand the documentation.

Public Comment from Tom Zuckerman (Delta Farmer/Advocate)

Mr. Zuckerman asked how Council staff moved from their goals to their strategy. In the example provided (restoring functional flows), the goal of progress towards restoring in-Delta flows uses a surrogate (flooding of the Yolo Bypass) of an artificial system not related to historical flow, as the metric to assess the performance measure. Zuckerman has trouble following the logic that we can go from having three major corridors into the Delta (from the north, east and the south) to having a metric that confines itself to one artificial diversion of water off the Sacramento River into the Yolo Bypass, and use that as an opportunity for a comprehensive measurement of what natural flows to the Delta would be. Davenport commented that the term to focus on is 'functional'. This is an example where there is scientific consensus and documentation that ecological functions of the floodplain are beneficial to fishes.

Zuckerman also asked for clarification about the reference to the State Water Resources Control Board's (SWRCB) Water Quality Control Plan. Does staff intend to have goals or standards that are independent than those of the SWRCB? Davenport clarified that the performance measures process is completely different and non-regulatory. Additionally, to be consistent with the Delta Plan regulations, one must also be consistent with flow standards set by the SWRCB.

4. Discussion about Performance Measure Process Review Response (All)

The Delta ISB is to restrict their review to the process of refining and updating performance measures, with the hope that a good, solid process would lead to more defensible performance measures. The original charge was given to the Board in December 2015. A draft review response is what is on the table for discussion. Ideally, the review response can be finalized tomorrow and routed to Council staff early next week in preparation for the February 25, 2016 Council meeting.

Brandt thought a description of the more detailed process of how staff went from selection of specific criteria to selection of specific metrics, should be documented somewhere. Collier concurs and always advocates for more documentation.

Lund observed that this process which was originally conceived to serve the purpose of evaluating the progress of Delta Plan implementation can also provide an opportunity for greater involvement and support about long-term performance assessment across different agencies and stakeholders in the Delta.

Fernando suggested adding a sentence about the uncertainty in terms of seeking expert opinion.

Atwater suggested that a 'review step' including regional stakeholders and participants in the process, could be added to the recommendations.

Wiens suggested an additional bullet in the 'Next steps' section that emphasizes the opportunity to coordinate the development and definition of performance measures with other agencies and the adaptive management process.

Action: This item is being held open until tomorrow so that Collier (better documentation), Wiens (adaptive management), Atwater (review step), Fernando (uncertainty in expert opinion), and Lund (broader collaboration) can submit their respective additions of the review response to Collier by 8 pm tonight. Collier will amend the letter and redistribute for tomorrow's meeting.

5. New Sea Grant ISB Fellow, Annie Adelson

Annie is a recent graduate from Stanford. She received her graduate degree in the Civil and Environmental Engineering Department, Environmental Fluid Mechanics and Hydrology, with a background in Ecology and Evolution. She hopes to help with one or two of the Delta ISB reviews, depending on what stage of development the reviews are in.

6. Hydro-salinity letter

This draft letter from the Delta ISB to Felicia Marcus (SWRCB), Mark Cowin (CDWR) and Randy Fiorini (Council), recommending a study of modeling barriers and levee-break effects on Delta salinity. This topic has come up in a variety of Delta ISB reviews (e.g. Flows and Fishes and

Water Quality) which is part of the rational for the letter. Initial feedback from Cowin and Marcus indicate there are work load issues that may prevent this from happening sooner than later. Lund knows of no such group that is currently formulating in the manner suggested by the letter, and is using the letter as a catalyst. Atwater suggests making that point the lead of the letter since the lead is currently buried.
Wiens sees the letter as useful for drawing attention to an opportunity and thinks it's entirely appropriate for the Board to respond to things in a manner that is not a formal review. He also points out that in the adaptive management review report, the Board draws attention to the opportunity to have an adaptive management experiment, similar to what this letter is suggesting. Wiens thinks a link to the adaptive management process would help highlight the kind of exercise being suggested in the letter, and provide a test of the adaptive management process in a real-world situation.
Action: This item will be held open until tomorrow so that Lund can modify the letter in the manner suggested by Atwater and Wiens. The Board will consider the letter again tomorrow.
Public comment"

- Tom Zuckerman (Delta Farmer/Advocate) offered that the Delta Levees Advisory and Habitat Committee don't think this would be a big effort for CDWR to get this done.
- Erik Ringelberg (Local Agencies of the North Delta) thinks this is a fantastic proposal because it address a couple of long-standing problems (i.e. only project proponents have the ability to use existing modeling tools and the entry barrier is very steep because you need a sophisticated degree of programming experience). Model scenario building can hash out potential opportunities that we have in the Delta and suggests that sedimentation is another driver that should be considered in addition to salinity.

7. Preparation for afternoon discussion

This afternoon Board members will discuss two of six topics during two time slots, in three different locations. This is an opportunity for Board members to start thinking about implementing future reviews (Integrating Science across Institutions, Water Supply Reliability, Monitoring Activities), rolling out completed reviews (Adaptive Management), and bringing other reviews to completion (Delta as a Place, Water Quality). A report from each of the Board members in attendance, sent to the Chair and the Chair-elect, will help organize panels for the coming meetings.
Hastings wanted the Board to know that staff needs a minimum of two months' notice to implement a panel. Additionally, Board members should indicate why the panel is needed, what the Board wishes to learn from the panel, and what specific information is desired from each expert requested.

8. Public Comment

There was no additional public comment.

9. Meeting adjourned for the day

2nd Floor Conference Room, Park Tower
980 Ninth Street, Sacramento, CA

1. Welcome back!

Delta ISB members present: Jay Lund, Steve Brandt, Richard Norgaard, Tracy Collier, Joe Harindra, John Wiens, Brian Atwater and Joy Zedler; Liz Canuel (via teleconference).
DSC/DSP staff present: Lauren Hastings, Kelly Souza, Jessica Pearson, Cliff Dahm and Annie Adelson.

2. Delta Stewardship Council Executive Officer's report (Pearson)

Executive Officer Jessica Pearson reported that:

- The Council completed its 2015 Annual Report.
- 2016 priorities include: amending the Delta Plan (one-year water transfers, refined performance measures, updating priorities for the Delta Levees Investment Strategy, and Conveyance, Storage and Operations), preparing for a potential appeal to the Council on consistency certification of California WaterFix, providing early consultation and science support on a variety of restoration projects including all the projects under the EcoRestore Program, supporting the DPC and Delta Conservancy, coordinating local land-use plans and habitat restoration plans to ensure consistency with the Delta Plan, rebuilding the capacity of the Science Program as a funding agency and carrying out the DPIIC high-impact action items, synthesizing and reporting scientific information via the *State of Bay Delta Science* report.
- At the beginning of the year, there was a mistake in the governor's budget summary mischaracterizing the Council's budget request of 3.5M to incorporate the California WaterFix into the Delta Plan. In actuality, the funding is for critical science investigations, and water supply and ecosystem amendments of the Delta Plan.
- There are two bills of interest, both are science/data related. AB501 (Levine) has recently been amended to provide additional authority to the Delta Science Program and the Council to request any state-funded data related to the Delta. It is unclear what the future of this bill is, but it is moving through the steps. AB1755 (Dodd) creates a publically accessible statewide information system for water data. It's unclear how this fits with the California Data Exchange Center, the Water Quality Monitoring Council's website, or the Data Summit White Paper that the Council completed last year.
- The Council meets on February 25th and at that meeting staff will be asking for Council-action on performance measures, setting the 2016 priorities, and hearing about the Delta ISB's 2016 work plan and adaptive management review report.

3. Follow-up on open item, Performance Measure Process Review Response

Collier incorporated all the changes received by 8 pm last night, and sent the revised response letter individually to all Board members. Outcome: Atwater moved to accept the final review response as written, subject to small editorial fixes by Collier and Brandt. Zedler seconded the motion. There was no public comment. All were in favor. Action: Collier will send the finalized review response to Souza by COB on Tuesday February 16, 2016.

4. Follow-up on open item, Hydro-salinity letter

Lund provided a brief description of how the hydro-salinity letter was revised last night, mainly to include a more intense focus on salinity. Outcome: Atwater moved to approve this letter as written, subject to small editorial changes by Lund and Fernando. Collier seconded the motion. There was no public comment. All were in favor. Action: Lund will send the finalized letter to Souza by COB on Tuesday February 16, 2016.

5. Lead Scientist Report (Dahm)

- SeaGrant Fellows Solicitation – 22 proposals were received in the four theme areas developed through the DPIIC. Seven proposals clearly rose to the top. Collaborating agencies may fund some of the other proposals totaling seven – nine newly funded propsoals.
- There was a meeting of the Science Advisory Committee yesterday. They discussed the *State of Bay Delta Science* report and some ideas about how to proceed on updating the Science Action Agenda.
- Earlier this week, Dahm delivered a seminar on fire impacts to water quality. He also used this opportunity to catch up on some of the research going on at UC Merced, specifically the UC Merced Sierra Prediction Tool.
- Dahm shares emerging science and newsworthy findings related to the Delta on a monthly basis with the Council. At the last Council meeting, Dahm reported that the highest high tides ever measured at La Jolla, Santa Barbara and San Diego stations were recorded in November 2015 (~60-90 year dataset). This was attributed to a concurrence of factors: warm water temperatures and the movement of water from the western Pacific Ocean to the eastern Pacific Ocean, attributes of the El Nino, a moderate sized storm, and a high tide (full moon). Dahm also provided an update on monitoring the rate of Sea-Level Rise (SLR). The Delta Plan, after much work by Jeff Mount and the Independent Science Board, used a range of 55 – 145 cm of SLR by 2100. Recent information in a science communication document from the American Geophysical Union, reported about an interdisciplinary monitoring effort that combines glaciology, oceanography and remote sensing which suggests SLR is 3 – 4 mm per year. Next, Dahm will apprise the Council about harmful algal blooms and their occurrence and growth worldwide. Dahm welcomes any suggestions from the Delta ISB about emerging science and findings that would be noteworthy to share with the Council.
- The Delta Science Program completed a very successful 3-day workshop looking at mercury in the Delta. Attendance each day was about 80 – 100 scientists and the areas of focus were sources, biogeochemistry, bioaccumulation and biomagnification. This effort follows up on a 2003 synthesis. Another workshop is scheduled for June 2016 and will result in a synthesis document for publication.
- The initial competition for funding under Proposition 1 has been completed by the California Department of Fish and Wildlife. That competition funded about 6.8M worth of projects in the Delta (available here). The Delta Science Program is also looking at another five of the proposals and may support a couple after an internal review process. Atwater asked what weight was given to adaptive management in the evaluation of those proposals.

Dahm could not recall a specific category attributed to adaptive management but will research it since it's an important topic.

- Dahm wanted to let the Board know that the Delta Science Program has also been discussing a topic similar to that which circulated in a Peter Goodwin and Jeff Keay document, Comprehensive Assessment of the Delta monitoring Enterprise. This is something the Delta Science Program believes they should undertake and Rainer Hoenicke has put some thoughts together about what this could entail. One idea is to bring in regional experts from other parts of the world who have been involved in comprehensive assessments and developing successful large scale restoration efforts (e.g. south Florida, South Bay Salt Ponds, Chesapeake Bay, the Danube, Puget Sound, lower Rhine, Queensland, etc.). Dahm suggests taking some time to think about how others have approached this and thinks that the Science Program might develop a plan in the next year. Collier's recommendation is to have a detailed discussion in March or April with the Science Program so that the Board has a good understanding of the Science Programs timeline and how to organize its own review appropriately around the subject. Collier also reminded the group of the emphasis on reviewing the Interagency Ecological Program (IEP). Lund suggested that any organization of a Science Program review should be coordinated with the monitoring experts on the Delta ISB so that the two are well-orchestrated.

6. Delta Science Program involvement in supporting EcoRestore adaptive management activities (David Okita, Hastings and Dahm)

One of the charges of EcoRestore is to implement an adaptive management program. Progress is being made with the formal establishment of a steering committee that will be meeting in the last part of March 2016. The steering committee will be comprised of policy-level folks from (mostly) state agencies but federal agencies will be invited soon. Secondly, a technical committee of practitioners is being formed, the Interagency Adaptive Management Integration Team (IAMIT). The IAMIT will assess where we are in terms of monitoring and the resources needed to have such a program. Okita will be working on how to fund and structure the EcoRestore program and hopes to give the Delta ISB a more detailed update in several months. Brandt asked if key targets, goals and decision-thresholds to determine whether adaptation needs to occur, have been developed. Okita explained that EcoRestore wouldn't make its own goals and targets, but rather use ones already developed in planning documents such as the Delta Plan. The Board stressed the valuable opportunities that EcoRestore represents; to make the mistakes that need to be made in order to actually learn how to do adaptive management (testing the process), and to have an experimental learning laboratory (testing the tools used in restoration).

Hastings mentioned other programs that the Delta Science Program is actively engaged with and explained that in part, the reason for the IAMIT is to integrate the many pieces of adaptive management that already exisits:

- California Department of Fish and Wildlife's Fish Restoration Program (FRP) – restoring 8,000 acres of tidal wetlands to support delta smelt habitat,
- Restoration Hub – focus on planning using the latest data, visualization and analysis tools,

- San Francisco Estuary Institute's Historical Ecology Group – layering their historical ecology work onto the contemporary landscape.

7. Discuss plan for adaptive management review report outreach

The outreach for the adaptive management review report will include a Council presentation (February 25) and IEP Workshop presentation (April 20), both made by Wiens. The objectives of the presentations are to make people aware of the report but more importantly, the challenges that need to be overcome to move the adaptive management needle forward. Another part of the outreach plan is to revisit the original interviewees to see if the review report hit the mark, is missing anything, and if challenges were identified appropriately. This should occur in the next few months, or maybe in conjunction with the April IEP workshop. Public comment was provided by Tom Zuckerman (Delta Farmer/Advocate). Zuckerman asked what kind of authority is needed to implement an adaptive management program and where does the authority rest? The Delta Plan (GP1) requires best available science and adaptive management to be used for all covered actions. It requires adaptive management for ecosystem restoration and water management actions. Delta Plan regulations only apply to State and local agencies but don't supersede any existing regulations of those agencies.

8. Reporting out on afternoon panel and review planning discussions

- Delta as Place – Zedler reported that she, Atwater and Norgaard believe there is strong rational to take this review to the next level, but it is not clear what that step should be. The team is assessing whether there are performance measures that evaluate how well strategies are protecting and enhancing the Delta as a unique place and where specifically more science is needed? They need to know more about the performance measures and the science needed before determining what the next step in this review is. Norgaard is still committed to this and Atwater and Zedler are acting in a supporting role.
- Water Quality – Canuel, Collier, Fernando and Annie Adelson are working though the public comments to broaden the scope of the review and formulating plans for two upcoming panels to inform the Board; one focused on anthropogenic chemical contaminants (e.g. organics and metals) and a second panel focused on nutrients and dissolved oxygen. They are targeting having the revised scope completed in May but will be utilizing a contract through the Delta Science Program for regional expertise in responding to the public comments. Canuel and Collier will provide staff a charge for each panel and clear instruction for the Boards purpose in inviting specific individuals.
- Water Supply Reliability – There is a panel of State, federal and private consulting experts who will be convening today. Next month, the Board should determine how to structure and approach the review. Lund is considering a hybrid review approach that contains both external participants and Board members since there are only a few people who have knowledge of the subject that don't also work for stakeholders.
- Monitoring – Brandt feels what the Board plans to do with a monitoring review is largely dependent on what the Science Program intends to do with a similar effort and the timeline with which they do it. Brandt requests more details about the Science Program effort at the March Delta ISB teleconference so that the Board can also construct a timeline for its own review. Brandt suggests inviting someone from the IEP and the Water Quality Monitoring

Council to describe those program to the Board at or before the IEP Annual Workshop on April 20 – 22, 2016.

- Integrating Science Across Institutions – Lund feels that the current make-up of the Board is well suited in terms of experience, knowledge of California problems and integrating science, to undertake a review of science integration in the Delta. The USGS is also planning a workshop with the same theme. Mike Chotkowski (USGS) is leading that charge and has developed a two-pager to start the conversation about how we all go about accomplishing this. He envisions discussions comparing science enterprises of different systems, centering around ideas such as organization, co-production of science, what measures they've taken to increase stakeholder involvement, what the science consortia consists of and how the efforts of the state and federal governments have combined to pursue science. Mike is willing to collaborate with the Council, the Delta ISB and the Delta Science Program, if there is interest. Collier will send Chotkowski the still-draft report from the Puget Sound Institute, Advancing the role of science in coastal ecosystem recovery: lessons from a comparison of practices. Mike is targeting the late summer or fall time period, but it is unclear where this leave the Boards review? Lund thinks that the Board should continue with the idea of having a special session or panel at the Bay-Delta Science Conference in November and perhaps and informal panel in July to help the Board get organized.

9. Water Supply Reliability panel

The Delta Independent Science Board convened a panel of experts to provide an overview about the adequacy of the science estimating water supply reliability, the complexity of the regulatory landscape, and what should be done to improve the science. The participants included Ron Milligan (Reclamation), Water Bourez (MBK Engineering), John Leahigh and Erik Reyes (CDWR) and Armin Munevar (CH2MHill). A synopsis of the conversation can be read here: https://mavensnotebook.com/2016/03/09/delta-independent-science-board-water-supply-reliability-panel/ and the Power Point presentation can be found here.

Public comment was provided by Tom Zuckerman (Central Delta Water Agency)

Mr. Zuckerman commented that it's interesting to see the ability of the State and federal projects connecting with local and regional projects to begin solving some of these problems. It isn't going to be the responsibility of only the State Water Project and Central Valley Project entirely to bring us into balance in this system. The question that Mr. Zuckerman poses is how much of these shortages could be resolved by conjunctive use and additional utilization of the vacated groundwater storage, and who's looking at that? Mr. Bourez reported that conjunctive management has been examined quite a bit (for CDWR), specifically a part of the Sustainable Groundwater Management Act which quantifies water available for recharge. Mr. Bourez agrees with Zuckerman that there is more that can be done on conjunctive management. Bourez cites the American River Basin as an excellent example of conjunctive management, but the problem he sees is that we cannot get enough water south of the Delta for conjunctive management in those regions.

10. Preparation for upcoming Delta ISB meetings

- The Board moved the March 17th teleconference from 9 am to 8 am.

- Major items for upcoming meetings include:
    - Update on the Delta Science Program Monitoring Activities (March)
    - Progress on future panel specifications (March)
    - Adaptive Management panel (April)
    - Briefing from the Delta Levees Investment Strategy group (May)

11. Public comment
There was no additional public comment.

12. Meeting adjourned