



Leading Change: The Collaborative Science and Adaptive Management Program and the Delta Science Plan

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In the Sacramento–San Joaquin Delta, “adaptive management” and “best available science” have become catch phrases describing how we will address the restoration of a highly altered ecosystem and improve the reliability of the water supply. The Delta Reform Act (2009) mandates the use of both as we work towards the co-equal goals. The Delta Stewardship Council has released a Delta Plan (DSC 2013) that calls for its Delta Science Program to draft a Delta Science Plan (DSP 2013) by December 2013. The Bay Delta Conservation Plan (BCDP) is nearing completion, and, as an eventual part of the Delta Plan, it too relies heavily on the two concepts. But, will adaptive management and best available science help us achieve the co-equal goals? The draft Delta Science Plan recognizes both concepts are necessary, but not sufficient. Success will require collaboration¹, integration, time, and a sustained commitment from all of us who conduct science in the Delta and all of us who rely upon it.

INTRODUCTION

This essay recognizes that success will require a conscious effort to actively “lead change” in how we approach and support scientific endeavors. The assessment of our collective ability to lead change is not a critique of scientists or science, but is critical of how scientific information for policy is generated and used. The process that resolves controversial policy decisions needs improvement. Delta scientists will need to work together in new ways, but they will only succeed if policymakers, managers, and stakeholders create the environment necessary for scientists to excel; this is the more difficult challenge. This essay suggests that for the Delta Science Plan to be successful, we must consciously lead the changes required for implementation.

¹ Collaboration is a mutually beneficial and well-defined relationship entered into by two or more parties to achieve shared goals.

A recent positive step forward is the formation of the Collaborative Science and Adaptive Management Program (CSAMP) and the Collaborative Adaptive Management Team (CAMT). The CSAMP and CAMT were formed as part of a federal and state proposal to modify the court-ordered remand schedule for the salmon and delta smelt biological opinions for the water export facilities. The CSAMP is a multi-agency effort led by a Policy Group that includes the Directors of the state and federal agencies involved in the biological opinions, and the Directors or top managers of the entities involved in the litigation that challenges those biological opinions. The organizational structure of CSAMP is illustrated in Figure 1. The CAMT, a mix of scientists and managers working under the direction of the Policy Group, will use a structured process to yield defensible conclusions. Its adaptive management framework promises to integrate information from research, monitoring, and modeling to inform Delta resource management and policy (Lohofener 2012). The CAMT could

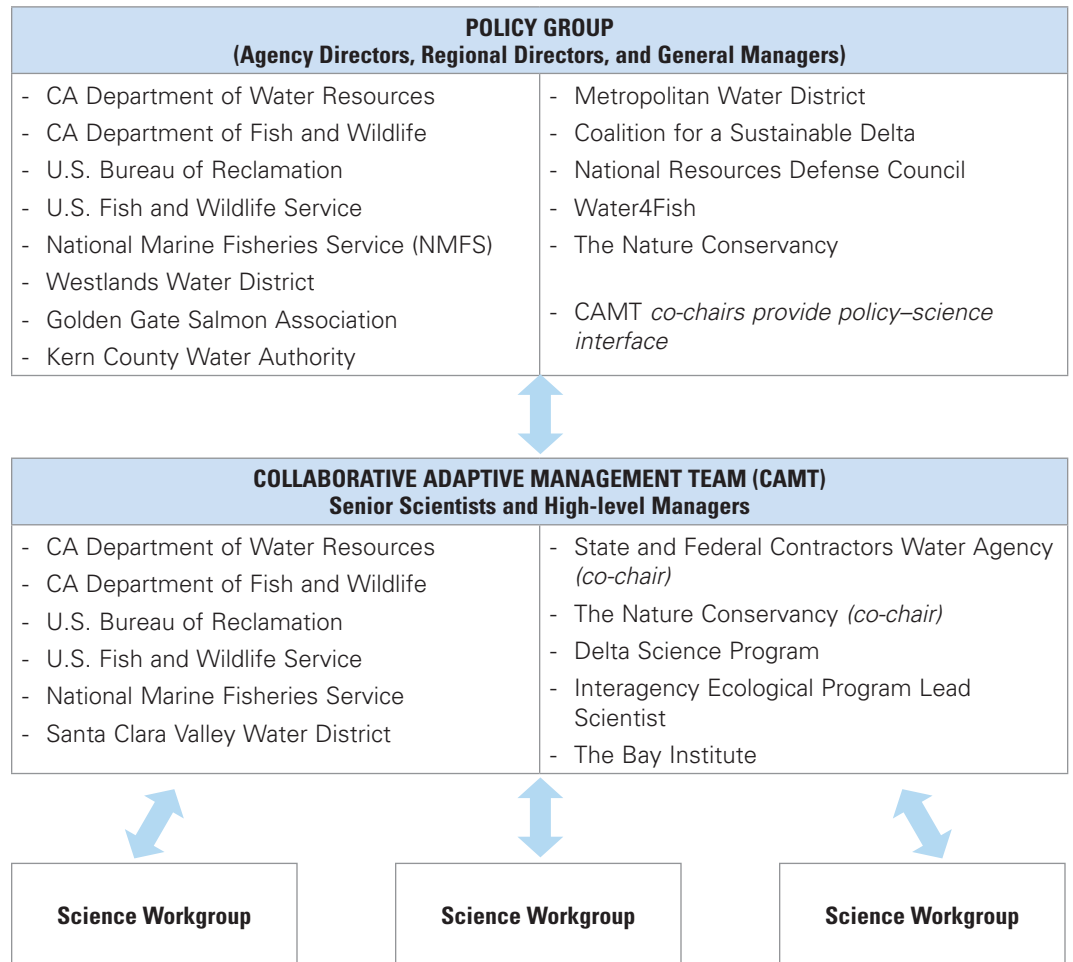


Figure 1 Organizational structure and membership of the nascent Collaborative Science and Adaptive Management Program

improve inclusivity and transparency in the development of operational strategies tied to the biological opinions. The goals are improvements in common understandings of the science, joint fact-finding, increased transparency through information sharing, and a commitment to work together. In the end, the parties hope to develop mutual trust that can overcome over-reliance on the courts to resolve disputed scientific and technical issues (USDC 2012).

The CSAMP represents an opportunity to test, on a limited scale, the type of collaborative, integrated science described in the Science Plan, by implementing proposed actions and approaches outlined in the Science Plan. The CSAMP is a potential pilot for implementing the portions of the Science Plan that include adaptive management, conflict resolution, engagement of decisionmakers in setting research and monitoring priorities, and a governance structure similar to the one in the draft plan. The CSAMP could model how new information would be used to promote a reduction in the multiple stressors of endangered fish species, optimize habitat restoration designs, and provide reliability for State Water Project and Central Valley Project operations. [Table 1](#) summarizes the role and functions of the teams comprising the CSAMP.

Table 1 Responsibilities of the nascent Collaborative Science and Adaptive Management Program

Policy Group	Collaborative Adaptive Management Team	Science Workgroup
<ul style="list-style-type: none"> • Provide input on priority Delta science needs • Demonstrate collaboration at the leadership level • Provide the interface to the public • Quickly resolve issues • Provide guidance to the CAMT • Plan the future of the Program 	<ul style="list-style-type: none"> • Develop a robust science and adaptive management program that will inform the biological opinions • Implement science-based framework for adaptive management • Develop key questions and problem statements • Evaluate potential management actions to protect one or more of the listed species • Develop an annual work plan, including the Science workgroups • Prepare and submit progress report to District Court • Address specific scientific issues following adaptive management framework 	<ul style="list-style-type: none"> • Develop annual work plan • Respond to external peer review • Assess results

THE PROCESS FOR SUCCESSFULLY LEADING AND MANAGING CHANGE

Because an integrated Science Plan that guides collaborative adaptive management will require that we change the ways we conduct, support, and use science, leadership of the change process is essential. I have developed and implemented new science-based programs many times in my career. My implementation success increased after I realized that accomplishing change in an organization has its own requirements, and that I needed a successful model to do it. John Kotter from the Harvard Business School (Kotter 1996) provided that model. Kotter's eight steps are summarized below, together with an assessment of our ability as scientists and policymakers to lead that change successfully. In the final analysis, leading and managing the change required to implement collaborative adaptive management will require time and a strong commitment from policymakers, managers, scientists, and stakeholders.

Step 1: Establish a Sense of Urgency

People don't change unless there is a compelling reason to do so. Major changes in approach require that most of the individuals being asked to change feel a sense of urgency. Urgency is driven by recognition of great opportunities and great risks (Kotter 1996). Most parties involved in the Delta, including the participants in the CSAMP, all agree on the urgency of changing current Delta conditions and the current dynamics surrounding Delta policy decisions. Abundance of listed fish species remains precariously low. Water supply reliability is threatened by pumping restrictions, drought, and climate change. The disrespect and distrust among entities representing different perspectives is extreme. No one wants to continue with the status quo. The CSAMP and Science Plan are real opportunities for change, while not changing will have critical impacts on both listed fish species and all who live in California.

Step 2: Create the Powerful Guiding Coalition

Putting together the right coalition of people to lead a change initiative is critical to its success. The coalition must have enough power, the right composition, a significant level of trust, and a shared objective (Kotter 1996). Clearly the Delta Stewardship Council that oversees the Delta Science Program and the Policy Group that oversees the CSAMP (Figure 1) are powerful guiding coalitions with the abilities to lead change, but change will require a strong and constant dedication from members of both groups. They need to:

- Develop a shared vision for science-based collaborative adaptive management;
- Communicate that vision to hundreds of people;
- Eliminate key obstacles;
- Ensure short term wins;
- Lead and manage projects; and
- Anchor new approaches deep in the culture of both the guiding organization and their individual organizations.

Step 3: Develop a Change Vision

Like the Science Plan, the CSAMP envisions science as being used for new purposes, rather than serving as the basis for legal actions among the interested parties who all support a healthy and productive Delta. The CSAMP sees science as the foundation for bringing diverse interests together, reducing uncertainties and conflicts, and discovering new solutions to the complex challenges ahead of us. That new vision, the transformation of science from an adversarial weapon to a tool for increased understanding and effective adaptive management, must be a centerpiece in the change process. Kotter suggests that the creation of a clear vision simplifies decision-making, motivates people, and helps diverse stakeholders coordinate their actions. The Science Plan serves as a clear statement of this vision. The CSAMP offers an opportunity to realize this vision on a pilot scale.

To be effective, a vision must take into account not only the current realities, but also set forth goals that are truly ambitious. When a vision is supported with a strong, credible strategy, it becomes evident to participants that the vision is achievable. The vision must both inspire action and guide that action. It should be a touchstone for making relevant decisions, but not be so constricting as to reduce the possibility of empowering action. The final Science Plan must be our shared vision. The CSAMP is that vision realized as a pilot study. Our biggest challenge is the opposing need to get it “right” and the need to get it done quickly. As both are developed, we all have a responsibility to make sure the visions effectively inspire and guide action.

Step 4: Communicate the Vision for Buy-in

It is critical that all affected parties understand and accept the vision and the strategy for achieving collaborative adaptive management. The Science Plan can rely on the development and implementation of the first Action Agenda (workplan) to assist with this communication step. The CSAMP needs a communication element. Directors, managers, stakeholders, and scientists need to use every effective communication channel possible to broadcast the vision. Even more important than what is said is what is done. Leaders who transform their organizations “walk the talk,” serving as living examples of the new culture toward which the vision aspires. Kotter is quite clear on the importance of this step. To be effective, the vision must be communicated constantly. With all the demands on directors, managers and scientists, this step will be a huge challenge to overcome; it is unclear that this step is occurring now.

Step 5: Empower Broad-based Action

The Delta Stewardship Council and CSAMP Policy Group have pivotal roles at this step. Each entity needs to identify ways to empower staff to champion the vision of collaborative adaptive management. Policy makers, managers, scientists and stakeholders need to identify and remove obstacles to change. This may require a change in systems, approaches, or structures. Resources and job duties may need to be redistrib-

uted. It is also important to encourage risk-taking and non-traditional ideas, activities, and actions, which is particularly difficult in large organizations.

One example of empowerment might be a change in the current working environment for agency scientists. Agency scientists could be better supported with some basic tools to maintain their skills and expertise. For example, scientists are often restricted from attending science conferences, and are not given easy access to journals. In addition, low salaries inhibit recruitment and retention of highly qualified scientists. State scientist morale is damaged by low pay relative to non-state scientists and other state employees doing equivalent work. I think we are “penny wise and dollar foolish” in shortchanging our scientists, especially considering the Reform Act, which is mandated in the Delta and requires best available science, and the estimated cost of achieving the co-equal goals.

Step 6: Generating Short-term Wins

Ensuring short-term wins is essential. The CSAMP has court-mandated deliverables that can be early successes. The CSAMP can be an early success of Science Plan implementation. Even small achievements provide early support for change efforts. Policy leaders must identify and plan for significant improvements that can happen in between 6 and 18 months. Getting these wins helps ensure an initiative’s overall success. Companies that experience significant short-term wins by 14 and 26 months after a change initiative begins are much more likely to complete the transformation (Kotter 1996).

Step 7: Never Letting Up

Currently, the CSAMP is focused on the period before the release of the new Biological Opinions. But the organizational structure and technical framework for adaptive management will require ongoing focus and energy for lasting change. New behaviors and practices must be fully incorporated into our shared culture to ensure long-term success. Performance measures and target dates are valuable in assisting with this step, but only if accompanied by program reviews and responsiveness to those reviews.

Step 8: Incorporating Changes into the Culture

New practices must “grow deep roots” to remain firmly “planted” in the culture. Every individual who joins an organization is indoctrinated into its culture, generally without even realizing it. The collective group of employees maintains an organization’s inertia over years and years. Changes—whether consistent or inconsistent with the old culture—are difficult to ingrain; we keep change in place by creating a new, supportive, and sufficiently strong organizational culture (Kotter 1996).

“How science is used is as important as how it is done.”

CONCLUSION

Will we be able to implement a collaborative adaptive management program to address the co-equal goals? I hope so. We have a new vision with the Delta Science Plan, and new opportunities to implement the vision through the CSAMP. We also have incredibly dedicated scientists, managers, policymakers and stakeholders who are eager to make these plans a reality.

Conducting the monitoring, research, and modeling to inform policy isn't easy, but it isn't the most difficult part: The hard part is creating the new, supportive, and sufficiently strong organizational cultures necessary to succeed over the long run. That cannot happen unless the entities that generate science and the entities that rely on it are committed to using integrated science as a means to reduce uncertainty and collaborative science to reduce conflicts by building trust. How science is used is as important as how it is done. Leading this change will call on all of us to practice the lessons that John Kotter can teach us.

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