

## The Delta Science Plan

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There are many science efforts in the Sacramento-San Joaquin Delta (Delta) that are well-designed and well-implemented to address a narrow set of issues. However, they lack the organization, support, and many of the approaches and tools needed to support the full range of policy and management challenges associated with achieving the coequal goals. A plan is needed to produce and communicate highly credible, relevant, and legitimate science to guide durable and comprehensive policy solutions and support effective and robust management actions for achieving the coequal goals. In addition, processes for developing and communicating high-caliber system-wide scientific synthesis are needed to inform Delta policy and management decision-making.

The Delta Science Plan, completed in December 2013, addresses these problems. It provides a strategy for achieving the vision of *'One Delta, One Science'* – an open Delta science community that works together to build a shared state of knowledge with the capacity to adapt and inform future water and environmental decisions in the Delta. The Delta Science Plan establishes and strengthens science synthesis and communication among policy, science, and management communities. It also builds the infrastructure for growing the knowledge base through identifying actions for prioritizing research, shared modeling, integrated monitoring, improved data management and accessibility, synthesis to accelerate knowledge discovery, independent scientific peer review and advice, and communication.

Since the completion of the Delta Science Plan, several of its actions have been initiated and accomplished by the Delta science community. New mechanisms for organizing science to inform policy and management have been established, an environmental data summit has resulted in guidelines for data sharing, and mechanisms for science synthesis are being employed. Shared implementation of the Delta Science Plan is creating a collaborative culture for science and accelerating the discovery of new understanding to inform decision-making to achieve the coequal goals.

**Keywords:** collaborative science, coordination, integration, policy-science, coequal goals, synthesis

**Session Title:** Implementing the Delta Science Plan: Improving Science Capacity to Meet Current and Future Challenges

**Session Time:** Wednesday 8:20AM – 10:00AM Room 308-310

## Interim Science Action Agenda

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While every agency has mission-specific science needs, many commonalities exist. However, there is no shared science agenda that lays out common priority science questions and actions for the whole Delta. This makes comprehensive and efficient science planning, funding, coordination and integration difficult, while critical science gaps persist.

The Interim Science Action Agenda takes an initial step in implementing the Delta Science Plan (completed December 2013) and creates a shared science agenda in pursuit of *One Delta, One Science* – which means an open Delta science community that works together to build a shared state of knowledge with the capacity to adapt and inform current and future water and environmental decisions in the Delta. The Delta Science Plan calls for a Science Action Agenda to prioritize and align specific science actions to inform management decisions and inform updates to our scientific understanding of the Delta as reflected in updates to the *State of Bay-Delta Science*. To make immediate progress on a full Science Action Agenda, the Delta Science Program, working with others, is developing an Interim Science Action Agenda.

The Interim Science Action Agenda is an initial list of shared priority science actions from existing documents and expert input to be addressed within a two-year time frame. Building on existing efforts, it will serve as a shared agenda for science collaboration among agencies and programs. It will be a collaborative road map for addressing science questions to inform decision-making about improving water supply reliability and the resilience of Delta ecosystems. The Interim Science Action Agenda will enable leveraging resources to accelerate learning and achieve shared science and information needs. It will also be the basis for the full Science Action Agenda that will cover a four-year time frame and include prioritization of science actions to inform water and environmental decision-making.

**Keywords:** science actions, coordination, integration, priority, decision-making, science and information needs

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## **Delta Science Vision- Sustaining Data Integration Efforts while Taking Advantage of Constantly Evolving Technology**

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Pressing matters such as climate change, an aging water infrastructure, and a deep drought affecting California force all citizens to recognize and respond to the fragile balance between our natural resources and competing water uses across the state - but nowhere more important than in the California Delta.

California's natural resource decisions must accommodate the rate of environmental change. To be effective leaders under these circumstances, state and local agencies, private organizations, academia, and the public must make use of today's innovations with an equally fast rate of adoption. The need for transparency and sharing of data demands an open community of science with interoperability data standards and state-of-the-art data exchange and access tools.

Decision-makers, analysts, and the public recognize the need for a common data sharing initiative. With the world's most advanced technology resources located in California and the Environmental Data Summit held in June of 2014, these resources provide recommendations to ensure that sharing information and building on our technology investments becomes the norm for improving natural resources management, rather than the exception. The resulting environmental data road map works towards achieving our common vision to identify solutions associated with:

- Improving data coordination, sharing, and interoperability
- Adopting new technologies for use across data generators and users
- Making environmental data meaningful for decision-makers and the public
- Providing alternatives in their pursuit of making defensible choices.

**Keywords:** Data Availability, Open-Data

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## Successful Business Models to Support Sustainable Technology Initiatives

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California enjoys its surfeit of technology innovation, and yet the state's resources agencies labor to keep pace with technological change, despite their best efforts, considerable expertise, and ingenuity. Initiatives to distribute environmental data more broadly and transparently have resulted in qualified success. The “My Water Quality” portals, for instance, are a good measure of environmental data-sharing efforts, but even each portal’s creators would readily admit that they are merely hinting at the possible rather than offering comprehensive solutions. The portals were developed under the stewardship of the Water Quality Monitoring Council’s workgroups, which are composed of multiple state agencies, as well as private, non-profit, and tribal representatives. While this model of engagement continues to yield results for broad-based collaboration, decision-making, and the advancement of scientific standards, each workgroup nevertheless finds itself at a loss for a business model to sustain its ongoing technology needs. This shortcoming represents, in microcosm, a shared experience for state agencies and partners alike.

This presentation highlights the challenges and the opportunities for producing successful business models to support and sustain technology initiatives. During the recent Environmental Data Summit, a cross-section of professionals -- scientists, technologists, business representatives -- sought to address the lack of a viable business model. The team coalesced around certain observations and proposals which have in turn been incorporated into a white paper produced under the auspices of the Delta Stewardship Council.

The emerging “vision document” explores the connections between the state’s open-data mandates and its technology development projects, while making recommendations for advancement. If technology remains expensive, then what are the costs associated with not sharing data more robustly? A viable business model forms the connective tissue among many information gaps that would facilitate information infrastructure development to keep pace with public demand, agency needs, knowledge development, and government mandates.

**Keywords:** Sustainable Technology Initiatives

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## **A Restoration Hub for the Delta – Better Tools and Process for Science Based Restoration**

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Recently the Delta Restoration Network (DRN) has developed a proposal for a Restoration Hub that would be developed as a 3 year pilot effort. The Hub proposal was developed by the DRN to address the following concerns about current restoration planning: 1. We lack a broadly accepted landscape-scale restoration vision for restoration opportunity areas supported by conceptual and mechanistic models, 2. We lack a standing expert restoration design team to support timely property-scale restoration project planning, implement long-term restoration visions for restoration opportunity areas, and consider the Delta-wide effects of restoration projects, 3. We lack sufficient early engagement of the Delta community, and 4. We don't have sufficient modeling, data inventory, and synthesis tools to support information sharing, analysis, and adaptive management. The Hub is intended to be a place where the best available tools can be used to integrate data and models and work with subject experts and community members to inform restoration planning and result in projects with high ecological value, with the least possible impact to current land uses and within the confines of the flood protection system.

The approach has been to work collaboratively on the development of the Hub concept and to develop a broad coalition of supportive agencies and organizations to demonstrate the necessity of the Hub to potential service providers and funders. The Restoration Hub is the place where we will bring together the best available tools, 21<sup>st</sup> century technology, and a workflow process that ensures best available science and adaptive management are the cornerstones of an effective restoration program for the Delta.

**Keywords:** Restoration, Big Data, Workflow, Coalition, Science Based Adaptive Management

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