
Stakeholder Feedback on Future Reviews

December 6, 2019

Delta Independent Science Board

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Background

In order to assist in planning future Delta Independent Science Board (Delta ISB or DISB) thematic program reviews, staff on behalf of the Delta ISB sent out a questionnaire to gather feedback from stakeholders, managers, and researchers in November 2019 on:

1. What are the most important and challenging (they are not necessarily the same) science issues you see in the coming years?
2. What scientific themes would you like to see the Delta ISB review?

The questionnaire was sent out to 22 individuals that attended the 2017 Delta ISB planning retreat. As of December 6, 2019, 10 individuals responded, which are included below. Responses #1 to 5 and 10 for each question were answered by participants on behalf of their organization, while responses #6 to 9 were answered as individuals and do not reflect the opinions of the organizations that they work for. For more background and information regarding the planning of future Delta ISB reviews, please refer to the [draft planning document](https://deltacouncil.ca.gov/pdf/isb/meeting-materials/2019-12-06-future-isb-reviews.pdf):
<https://deltacouncil.ca.gov/pdf/isb/meeting-materials/2019-12-06-future-isb-reviews.pdf>.

Question 1

What are the most important and challenging (they are not necessarily the same) science issues you see in the coming years?

#	Response
1	Moving to open science infrastructures and establishing working protocols for uploading datasets to open platforms and repositories.
2	Impacts of a changing climate on the Delta - not just the ecosystem, but Delta agriculture.

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#	Response
3	The accelerating deterioration of the southern part of the Delta in terms of ecosystem function, water supply, channel capacity occlusion, harmful algal blooms, invasive weeds, water quality, dissolved oxygen, water temperature, etc.
4	Climate change; improved linkage between environmental managers' information needs and the design of scientific studies to address those needs.
5	How will the Delta respond to rapid change brought on by climate change and sea level rise?
6	<p>Not in order of importance:</p> <ul style="list-style-type: none"> a. predicting and preparing for climate change/global warming/sea level rise impacts, b. predicting/preparing for impacts of large-scale levee failure on ecosystems and water supply, c. understanding the Delta as a novel ecosystem, d. providing more fresh water for aquatic ecosystems, e. dealing with new invasive species, f. reducing effects of contaminants, old and new, g. extinction of native species, h. floodplains as habitat for fish.
7	Integration of biological, chemical, and hydrologic data in order to better understand tradeoffs among objectives for managing the Delta land and water resources.
8	<ol style="list-style-type: none"> 1. I would like to see more restoration projects work in sync with communities that currently work and live in the Delta, and who are working to manage the lands and waters in the Delta. 2. I would like to see more entities and projects incorporating native people and practices to continue to bring their presence back into the Delta and conversations about the Delta. 3. There is a deficit in physical and geophysical datasets describing conditions in the Delta that are at a high spatial and temporal resolution, and also open source. How can we put more efforts and resources into developing products that can help facilitate current and future restoration projects? 4. How to increase connectedness of Delta related issues and projects to other systems in the area and around the globe, to collaborate and share techniques, research, findings, knowledge, etc.

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#	Response
9	<ol style="list-style-type: none"><li data-bbox="263 241 1424 493">1. The need to develop a better understanding of groundwater inflow into and out of the Delta. This includes water quantity and water quality. The groundwater component of the Delta water budget is one of the most poorly understood components of the system. Its impact on water quality and quantity, and habitat is unknown and may be substantial during certain periods of the year.<li data-bbox="263 514 1424 609">2. The development of means to accomplish groundwater recharge through a variety of methods including artificial methods.<li data-bbox="263 630 1424 934">3. A through analysis of sediment movement through the delta channels is needed. This should include sediment sources to the Delta as well as transport through the Delta. Are spring flushing flows capable of moving sediment through the Delta channel system? If they are not, what is the long-term morphology of the Delta going to look like, and how should we incorporate that into our existing planning and restoration efforts?<li data-bbox="263 955 1424 1438">4. A realistic peer review of climate change studies should be undertaken to evaluate the likelihood of the different sea level rise estimates. Adjusting to future sea level rise is critical for any long-term planning and management of Delta resources. The existing error bars surrounding many of the estimates make any realistic planning effort almost impossible. The study should not be undertaken not to redo what has already been done, but to evaluate the existing studies with respect to assigning a probability to the different sea level rise estimates. Similarly, how realistic are some of the catastrophic sea level rise projects for the SF Bay Delta?<li data-bbox="263 1459 1424 1833">5. A more detailed flow analysis is required to properly understand flow in the Delta channels. The existing hydrodynamic models are primarily calibrated to stage in the individual channels, which works well in riverine systems, but is a poor and misleading calibration parameter when evaluating flow in a system of delta channels. The quality of habitat in the Delta is directly tied to velocity and flow movement, which has a high level of uncertainty in all but the major Delta channels.

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#	Response
10	<p>a. linking effects of flow and non-flow (eg, restoration) on Delta ecosystems including on species of interest, such as salmon, etc.</p> <p>b. understanding cumulative effects of multiple actions on Delta ecosystems (related to the ISB's earlier efforts considering multiple "stressors" but in a positive sense: how do multiple positive effects interact, especially across spatial scales).</p> <p>c. evaluating how climate change will effect future land use and other social issues/decisions within the Delta over the coming decade.</p> <p>d. understanding how extreme events effect ecosystems, especially long-lasting affects.</p> <p>e. better understanding of food web effects across a mix of primary producers from aquatic to marsh.</p>

Question 2

What scientific themes would you like to see the Delta ISB review?

#	Response
1	Ecological Forecasting? Or just a shot in the dark?
2	More social science related to the Delta.
3	It seems like we face a threshold planning choice: (1) allow out-migrating San Joaquin River origin salmon smolts to make a "left turn" off the San Joaquin River mainstem and enter the southern Delta at the confluence with Old River OR (2) create a permanent operable barrier to keep smolt in the mainstem as the ecologically preferable out-migration path. Either choice implicates resulting salmonid habitat management decisions, but we need scientific input to make this critical management decision. The current circumstance (relying on construction/dismantling of temporary barriers at the Head of Old River and at dependent interior sites) is inadequate, because construction is physically impossible at SJR flows above 5,000 CFS, meaning that the default condition in high flow springs is to "invite" smolts to enter the degraded southern Delta.

DRAFT (12/6/19)

#	Response
4	<p>We are very interested in the four review topics that the DISB is already considering, with the two Climate Change topics being of particular importance. Within the topic Restoring Ecosystem Function, we agree that it would be beneficial for the DISB to review the potential methods and expected outcomes of restoring ecosystem function in the Delta. We encourage you to include functional flow management and habitat restoration (area, complexity, and connectivity) in your review.</p> <p>In future reviews, whatever the topic, we hope that the DISB will continue its recent efforts to determine how the Delta community could better connect scientists' research efforts (e.g., in response to Requests for Proposals) with managers' decision needs. Often there is a disconnect between managers stating their information and knowledge needs for decision making, these needs being rolled into a request for proposal, scientists interpretation of the corresponding research need (and connection to their own research interests), and the actual research studies and their results. The recent efforts of the DISB in reviewing the IEP and the Delta monitoring enterprise have started us in a better direction, so it would be helpful to continue to weave this "theme" or "concept" into the DISB's upcoming reviews.</p> <p>Thank-you for all your efforts to improve Delta science and its use!</p>
5	How will we evaluate performance of restoration function and scale in a changing climate?
6	<ul style="list-style-type: none"> a. Reconciliation ecology b. Regime shifts, past, present, future c. Ecosystem management
7	Flexibility and resilience in water management systems.
8	Native people, data, open source data, national and global collaboration.
9	No response provided.
10	<ul style="list-style-type: none"> a. linking social science and natural science inputs into decision making b. climate change c. incorporating new technologies/tools and analyses (including modeling) into Delta science and decision making