DRAFT

To: Mark Cowin, Director, California Department of Water Resources
Felicia Marcus, Chair, State Water Resources Control Board
Randy Fiorini, Chair, Delta Stewardship Council

cc: Charlton Bonham, Director, California Department of Fish and Wildlife
Campbell Ingram, Executive Officer, Delta Conservancy
Erik Vink, Executive Director, Delta Protection Commission
Mark Sogge, Regional Director, US Geological Survey

From: Delta Independent Science Board

Regarding: Modeling barriers and levee break effects on Delta-wide water quality

At our October 2015 meeting the Delta ISB heard two excellent talks on hydrodynamic model applications to explore water quality and flow impacts of drought barriers and Delta island flooding. Flow barriers (e.g., to prevent salinity intrusion) and island flooding (e.g., from levee breaks or restoration) can have widespread water quality effects, driven by complex interactions of tidal and stream flows with bathymetry, water bodies, soils, and mixing. These effects and interactions are most reliably predicted through hydrodynamic modeling, particularly for future conditions.

Federal, state, and local agencies, universities, and consulting firms have substantial hydrodynamic and water quality modeling capabilities that could be employed to address broad management and policy questions for a range of Delta problems. However, almost all modeling efforts must be focused on urgent project-specific management needs, so less broad community understanding of Delta water flows and quality has developed.

We recommend that the State Water Resources Control Board and the Department of Water Resources co-sponsor a broad systematic hydrodynamic and salinity modeling study of the effects of barriers and island flooding on water quality throughout the Sacramento–San Joaquin Delta. A shared analysis of water quality interactions for diverse locations and a range of barrier and island-flooding conditions would more transparently, consistently, and inexpensively inform and integrate many agency and public discussions. These could include:

- State Water Project and Central Valley Project planning, operations, and regulation
- Water quality control plans, permits, and other water quality regulations
- Risk assessments and responses for levee failures
- Delta levee investment policies and decisions
- Emergency planning for responses to levee breaches
- Installation, and operation of barriers for drought, water quality, and fish movement
- Delta-wide water quality impacts of local habitat restoration activities
- Local, state, and federal planning and permitting for wastewater discharges and water diversions for a range of plausible conditions

This shared effort should include knowledgeable state, federal, and local agencies and stakeholders, as well as academic and independent experts, in its planning, funding, and peer-review. The study should consider Delta salinity and flow effects for a variety of locations and water years under both current and future conditions (e.g., with sea-level rise). Where possible, it would be useful to employ publicly available models, with results and model output made available for additional analysis (such as transport of additional water quality constituents).

The cost and duration of an initial systematic study need not be large. The study can largely use existing data and modeling capabilities (the best available science). The analysis should yield a shared, coherent, and transparent scientific basis for many important Delta decisions, and would better focus (and often obviate) further project-specific studies. A peer review and assessment of uncertainty of model predictions, and attention to model testing and validation would support this work.

This is an opportunity for agencies and others to jointly conduct technical work of mutual importance to provide a common and more coherent knowledge base for making a range of important Delta decisions.

All involved in the Delta realize the arduous demands on agencies, experts, and stakeholders. Policy issues are multi-faceted and decisions are far reaching. The approach we suggest is an opportunity to consolidate and build understanding across agencies and interests for broader and more far-reaching policy insights.

Thank you for considering our recommendation for a project that seems both timely and broadly important. We can gladly discuss details of our recommendation.