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Plenary Session Subject: Doing More with Less; Moving Toward Long-term Sustainable Use of Delta and Bay Water

Achieving the Co-equal Goals of the State of California

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The Delta Stewardship Council is directed by statute to prepare, adopt and commence implementation of a Delta Plan, which will have legally enforceable elements, by January 1, 2012. Fundamental to our creation is the Coequal Goals, which are state law, not created by our Delta Plan:

“Coequal goals” means the two goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place.” Water Code Sec 85054

To the surprise of most political insiders, the Legislature and Governor Schwarzenegger approved a 5-bill water package in 2009. At the time, many argued this was the most significant water policy step in almost 50 years.

It should surprise no one that the passage of legislation, and establishment of clear state policy concerning water use and the Delta, has not ended the water wars. But it has provided a new threshold for water development and operations, and the Delta ecosystem as well. Over time it will force both water districts and the environmental community to face up to the coequal goal of a more reliable water supply for California, and an improved and restored Delta ecosystem.

The cornerstone of the new, enforceable Delta Plan is the “Coequal goals” and how they apply to ‘covered actions’ of state and local agencies to which they apply (Water Code sections 85022 and 85057.5). At the same time, state policy now favors reduced reliance on the Delta for future water supplies, some version of the Bay-Delta Conservation Plan, and a much stronger role for science.

In the past five years, as Chair of Governor Schwarzenegger’s Delta Vision Blue Ribbon Task Force, and now as Chair of the Delta Stewardship Council, I have learned many things. The

most important is that our water supply and the ways we use water, and the ecosystem we protect or damage are deeply interconnected.

Whether we get water from rivers or underground aquifers or whether water originates in the Sierra Nevada, or comes from the Colorado River, those accumulated drops of water are the property of all the people of California, and held in trust by our government and our laws. Our future as a state and society is based on our ability to balance competing interests and follow the rule of law. And, as we have learned over the past 50 years, our desire to have a modern, developed society rests on how it prizes and protects its natural environment and a reliable supply of water.

California may be one state, but our history of water wars suggest that we see ourselves as warring principalities --- perhaps like the nation states of the Balkans or the Middle East --- with historic regional, economic and political animosities driving the debate.

If the issues are statewide, why focus on the Delta?

Historically, runoff from about 40 percent of the land of California, including most of the Sierra Nevada mountain range, flowed into the Delta, then to the Bay and into the ocean.¹ That runoff helped to create one of the most significant ecosystems in the world. Even now, with the historic Delta ecosystem in decline, it remains one of the largest estuaries in the Western Hemisphere.

For over 100 years, the Delta has figured in the plans and dreams of water engineers and their sponsors. In 1960, the voters of California approved the State Water Project, and approved the transport of water from the Delta to communities in the San Francisco Bay Area, farmers in the Central Valley and urban areas down to the Mexican border. Yes, the voters also rejected a Peripheral Canal in 1982, but the original voter approval was not repealed.

Only in recent decades have federal and state environmental laws, numerous court decisions and numerous regulations forced water users to take account of any damage they might do to the environment. Those laws have halted some proposed water projects. This conflict lies at the heart of our struggle over water and the Delta ecosystem.

Virtually all who have spoken to the Delta Stewardship Council have said that the status quo is unacceptable, and that the Delta ecosystem is in a severe decline. Although not happy with the status quo, many of these same water warriors fear change. My view is that change is inevitable and better we deal with it than sit back and hope for the best.

Some context for your consideration:

- 1. Our statewide water supply is under stress and that stress will continue.** Our available water supply is increasingly volatile. High water flows are more frequent, as are low water flows. Climate change appears to be the main reason, but whatever the reasons, changes lead to a different proportion of rain and snow in the Sierra Nevada, our

state's natural reservoir. Increasing volatility means our current water storage and flood control systems are less efficient than designed to be.²³

- A. Our total water supply is relatively finite and has changed little in the last 30 years, while demand continues to grow.**⁴
- B. The reliability of the State Water Project is declining.**⁵ and ⁶
- C. Our economy is still growing, the amount of water humans use is also growing overall even though per capita use has been declining, albeit unevenly**⁷.
- D. We are overusing our groundwater supply in significant areas of the state.**⁸ and ⁹
- E. We annually use more water than nature provides.** A more polite way to say it is that storing water in a dam or underground is one of the many ways we stretch a finite supply and use it *during dry water years*. Increasingly, however, we are relying on our dams and underground sources for water in average water years. The Delta Plan draft, as with the Delta Vision Task Force that preceded it, suggests that increasing wet year exports must inevitably lead to reduced exports in dry years, and some average water years as well if we are to protect/restore the ecosystem.

Does this discussion of supply and demand sound familiar? It should, since our current water/ecosystem debate is a mirror image of our national and state budget battles.

“Never raise taxes or cut spending” is the consolidated cry of the competing political forces in America. Each side prefers one action, but they cannot bring themselves to face up to limits. Thus, we have adopted the “borrow money to continue to pay ongoing debts” as the only ‘solution’ that works. It is very much like our water debate: we refuse to talk about the limits of our supply, and simply demand a guaranteed amount. That is true for those who argue that human uses of water are superior to environmental uses --- and vice versa. If borrowing money ultimately has to stop, so too must the endless promises to deliver water, without regard for the consequences. We are running up against the practical limitations of supply, and have little way to meet all the demands --- unless we change the way we behave.

2. The Delta ecosystem is in decline.

- a. **The species that live in the Delta are in serious decline and have been for almost a century** ¹⁰ and ¹¹.
- b. **The amount of water that flows into and through the Delta, heading to the ocean has declined significantly.** This decline in fresh water reaching the Delta and the Bay is attributable to increased water use throughout the Delta Watershed, use of water by in-Delta users, and by the amount of water exported from the Delta.¹² Ironically, the proportion of water diverted by those in the Delta Watershed significantly exceeds the amount exported from the Delta ¹³
- c. **Most of the historic Delta wetland habitats have been lost.** ¹⁴ And since no good deed goes unpunished, sea level rise threatens to wipe out many habitat restoration activities.
- d. **Stressors compound the problems.**¹⁵ After we talk about habitat and water flows to the Delta, the conversation inevitable turns to the multiple related problems --- upstream urban pollution, agricultural runoff, the Sacramento Regional Sanitation Plan, or the argument that striped bass are causing the demise of our salmon population

The difficult job is not to list potential stressors. The really hard job is trying to figure out which ones to attack first, and whether they will or will not favorably impact the ecosystem. Since there will never be enough money to do everything, how and where we start is key.

Although the discussion of ‘stressors’ is useful, we should be skeptical of those who nominate a single villain ---upstream diverters, the water exporters, predatory fish, agriculture, or environmentalists --- and seek to blame them for every problem in California. We would probably do better to look in the mirror and acknowledge that all of us, those of us who live in the Sacramento Valley, the Central Valley, this Bay Area, and urban Southern California, have played a role in the decline of the Delta ecosystem. All of us have a duty to help in the solution.

- e. **The Delta is inherently flood prone, and no level of flood protection can guarantee complete safety to residents, the Delta ecosystem or to the current Delta water export system.** ¹⁶ Current federal, state and local disaster and emergency response programs are inadequate to protect against the dangers to life

and property in the Delta.¹⁷ Levees in the Delta are not sufficient to protect urban development, nor should urban development be encouraged. It will surprise no one that some local communities have plans designating urban development for lands likely to be impacted by sea level rise.

Some levee improvements are reasonable and will allow continuation of the unique Delta that exists today, although they will be with a lower-than-urban level of flood protection. That level will permit agriculture and the ecosystem to coexist. Prohibiting development on floodplains is essential to protect life and property, and state interests in the Delta, is mandated by law, and also needed to help achieving the coequal goals.¹⁸ Those choices run against the grain of some, and require the kind of tough decisions the draft Delta Plan makes.

- f. **The unique rural character of the Delta is threatened by urban growth.** Even with the vast changes over the last 161 years, the Delta of today remains largely rural. It should remain largely rural and must be protected from urban development that creeps in from the edges. The Delta is not just a location for water pumps and pipes, of course, nor is it a place that will slowly revert to wetlands; some loss of land will occur in the future, as it has in the past¹⁹ and²⁰.

That's the context, but let me talk about three of the most important and controversial provisions of the 2009 law.

Big Change: Reducing reliance on the Delta

The 2009 water bill package contained the following directive:

“The policy of the State of California is to reduce reliance on the Delta in meeting California’s future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts.” Water Code sec. 85021

State law requires state and local agencies with a ‘covered action’ to be consistent with the Delta Plan. The draft Delta Plans calls on them to show the following²¹:

- Demonstrate compliance and implementation with the Urban and Agricultural Water Management Plans they are currently obligated to prepare. It will not surprise you to learn that some water districts are very unhappy that they will be expected to do what they have promised to do.

- Demonstrate how they will continue to operate if there is a possible interruption of Delta water supplies for a minimum of 18 to 36 months.
- Identify the programs and projects to be implemented in the next 20 years that deliver real water conservation, water efficiency and water supply development, as called for by state law.
- Explain and evaluate their regional water balance (how to match supply with demand)
- Implement no later than December 2020, a conservation-oriented water rate structure.

And to make sure that the Delta ecosystem, one of our coequal goals, is protected, we say the State Water Resources Control Board should adopt Delta water flow standards no later than 2014 and Delta Watershed standards by 2018, consistent with statute. It will not be easy, as Fran Spivey-Weber will no doubt indicate, but it is essential for both water reliability and for an improved and protected Delta ecosystem. And the Board has been trying to do this very thing for a long time.

Big Change: The Bay Delta Conservation Plan (BDCP)

The Delta Stewardship Council is a potential appellate body for BDCP, directed in statute to incorporate BDCP into the Delta Plan if it meets the requirements imposed by law, but only if the Department of Fish & Game determines that it meets those tests. If the Fish & Game decision is appealed to us, we can say whether they were correct, not correct, or ask questions and solicit more details. However, we cannot write our preferred version of BDCP.

All of which offends many people who spend their lives fighting for, against, or just being puzzled by BDCP. All of these warring parties prefer us to join their cause immediately, and reject anything they dislike. Because of our appellate role we cannot prejudge BDCP, and we are skeptical when one side or the others demands we support their preferred policies.

The Fifth Draft Delta Plan calls for speedy completion of BDCP. Personally, I would like to see it finished in the next 2 months...but I defer to Jerry Meral on that point. It does need to be finished soon.

It is almost impossible to look out to the year 2100 --- as the Delta Plan does --- and not see the need for major improvements in our water supply system in and through the Delta. It is worth remembering that any highway, high school, office building, energy system, dam or water conveyance system has a finite life expectancy. At some point, it will need to be repaired and sometimes rebuilt or replaced.

Is the Brown Administration helping? The answer is yes. They have semi-civilized the process by removing a loyalty oath for participants, which was very important. They are pushing the schedule, which is coming up on seven years. Are all the problems resolved? Of course not, no one expects a 50+ year deadlock to be resolved easily.

Big Change: Giving science a far more important role in water and ecosystem decisions

One of the interesting mandates of the 2009 legislation was that the Delta Plan be based on the ‘best available science’ and that ‘adaptive management’ and ‘performance measures’ be a necessary part of the plan.

That sounds simple until you understand that every project proponent in California claims they are already using the best available science and adaptive management.so we should leave them alone. And scientists keep telling us how hard it is to do all this.

The Delta Plan cannot ignore our statutory mandate to increase the role and importance of science. And we would not ignore that goal even if it were not so clearly stated in statute. Accordingly, we have tried to define the terms (which is not done in statute), and suggested a science-based approach for all future covered actions that will be judged.

Have we succeeded? Perhaps, but we have more work to do, particularly with the selection of performance measures to determine success or failure towards achieving the coequal goals.

All this suggests a caution to you scientist out there: be careful what you ask for, you might get it.

Science is increasingly important in ecosystem management, and the coequal goals strongly move toward scientific involvement in water system construction and operations as well. When I feel mischievous, I like to imagine a time when scientists are voting members of governing bodies that build and administer public works projects, and are responsible for achieving the coequal goals. That means you have to enter the fray, not sit back and just say no.

At the 2010 Estuary Conference, I listened to a talk by Dr. John Wiens, the very, very smart landscape ecologist from Colorado State University and now Chief Conservation Science Officer at the Point Reyes Bird Observatory. He may well object to me focusing on one short statement he made, but for an old public policy war horse like me, it was a revelation.

Dr. Wiens talked about ‘best available science’ and how it could mesh with the public policy process that demands action be taken. With significant qualifications he concluded that at some point action was needed, and while science can never be perfect, it has to be ‘good enough.’ . That shorthand standard ‘good enough’ works --- but only if it surrounded by detailed, precise and intensive study and research, monitoring and evaluating, done by independent scientists who are free to express their opinions.

Five Vexing Questions

I leave you with five vexing questions fundamental to whether California succeeds or fails in dealing with its water and the ecosystem problems. The Delta Plan talks about several of these

questions, but over time the State will have to address them again. Several of my smart Council colleagues have their own vexing questions, somewhat different from mine. Here is my list:

- **Water Reliability**

Should the state of California guarantee to deliver more water on average than nature provides? If not, why do we sign water contracts (often called ‘paper water’) that, on their face, appear to promise just that? ²²

Related to this question is something equally perplexing.

How can California’s water delivery system be made ‘more reliable’ if we do not keep track of the full amount of existing water rights, and have no idea of the amount of water that might be required under Area of Origin laws? If there are individuals and areas with a legal entitlement to a vast unknown and unknowable amount of water, regarding of any other social needs, how can any water system be truly reliable? Should they come forward and make their claims now, rather than waiting for some unknown date in the future? And to compound the problem, why do we refuse to keep careful track of who uses how much water, and for what?

- **Conservation**

The State Water Plan, the Delta Plan, and virtually any other significant study or research acknowledges that water conservation and related water system efficiencies are one of the few ways we can succeed as a state. And those studies all indicate that everyone who uses water in the state must do their share. As a result of the 2009 legislation, all major urban water users are required to reduce their per capita water use by 20 percent by the year 2020. Agriculture statewide, which uses about 3 times more water than all other human uses, is not required to meet any target for reduced water use. How can this continue?

Just to tell you, I have never thought that the same level or percent of water conservation can realistically be imposed on agriculture. But some measurable savings could be, and we would still have a vital agricultural economy.

- **Protecting the Delta Ecosystem**

The Delta Reform Act of 2009 adopts “...protecting, restoring, and enhancing the Delta ecosystem” as state policy. Can California realistically guarantee to restore every species in the Delta, particularly when facing climate change? If not, what level of restoration should we seek to achieve?

As important, how do we move from the current litigation driven, species-by-species provisions of the Endangered Species Act, to a new system that focuses on the entire

ecosystem? In other words, how do we get the courts out of trying to run water operations, ecosystem restoration and second-guessing the judgment of scientists?²³

- **Underground water**

This is not the question of whether over drafting of ground water is a good idea. No one claims that it is. Nor is it the question of regulating groundwater. It raises a totally different question.

When communities exhaust their groundwater supplies, or pollute them so much as to make groundwater unusable, or when those communities choose to not treat their polluted groundwater, are they automatically entitled to replacement surface water? If so, who or what gets less water so these replacement supplies can be delivered?

- **Do Californians share common values about a reliable water supply and an improved ecosystem? If so, how do we know that?**

I confess being troubled by my 40 years as a public official, and involvement in water fights for much of that time. As I look at opinion polls, and study how people vote, it occurs to me that the citizenry of this state and country can't seem to find common purposes. And if they find them, they don't seem to stick with a long term program to achieve those common purposes.

Perhaps it is because we are in a major recess[ion], but the citizens of California (and America) seem to have exhausted their willingness to pay more taxes or fees for much of anything. If that is the case, what can we realistically expect to do either for a more reliable water supply for California, or a Delta that must be protected and restored?

Every time I give a speech like this, someone comes up and asks me "why are you so cynical or pessimistic"? Actually, I consider myself optimistic. How could I do what I am doing without having an unreasonable level of hope? I am convinced that what serious policy discussion needs more than anything else is telling people what they need to know; not what they want to hear.

A final word to the smart, dedicated and stubborn scientists that work in resources field: Stick with it; you are winning even if you sometimes doubt it.

And a special word to Dr. Cliff Dahm, our departing Delta Lead Scientist. We have benefitted from your knowledge, your ability to explain concepts to people who struggle to understand them (that means me), and your willingness to 'speak truth to power'. Whatever good the Delta Plan will do is substantially due to you and your very talented staff; any faults lie elsewhere. Please, keep it up.

It is honor to appear before you.

¹ California Department of Water Resources. 2009. *California Water Plan Update 2009*. Sacramento, CA. http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v3_ssldeltaregion_cwp2009.pdf

² Cayan, D. R., E. P. Maurer, M. Dettinger, M. Tyree, K. Hayhoe. 2007. *Climate Change Scenarios for California*. October. <http://www.elkhornsloughctep.org/uploads/1292272719Cayan%20et%20al.%202008%20climate%20CA.pdf>

³ Moser S., F. Franco, S. Pittiglio, W. Chou, D. Cayan. 2009. *The Future is Now: An Update on Climate Change Science Impacts and Response Options for California*. May. California Energy Commission. <http://www.energy.ca.gov/2008publications/CEC-500-2008-071/CEC-500-2008-071.PDF>

⁴ California receives about 97 percent of its total water supply from rain and snow. Water managers prefer to see most of the water in the form of snow, which is natural water storage, but climate change is leading to more rain. At the same time, records of precipitation (rain and snow) going back to 1890 show only a very slight increase in overall moisture coming into the state. Data compiled by Jim Goodridge, state climatologist, formerly of California Department of Water Resources, Division of Flood Management, Hydrology and Flood Operations Office, Hydrology Branch. Department of Water Resources. 2006. *California Climate Change: A Historical Perspective*. http://www.water.ca.gov/climatechange/docs/200610_ClimateChangeHistorical_CALFEDScience_manderso.pdf

⁵ Since 2000, the Department of Water Resources has issued four (4) reports on the reliability of the State Water Project. They show that reliability has declined from 75% in 2002 to 63% in 2009. Department of Water Resources: Bay Delta Office. http://baydeltaoffice.water.ca.gov/swpreliability/SWPreliability02_final.pdf

⁶ California Department of Water Resources: Bay Delta Office. *State Water Project Reliability Report 2009*, and previous years. <http://baydeltaoffice.water.ca.gov/swpreliability/Reliability2010final101210.pdf>

⁷ Aaron Farber (DSC) chart. California's urban water use varies dramatically throughout the state: high in the deserts, but almost as high in the inland regions of northern and central California. Some areas along the ocean benefit from a lower temperature, and in key urban areas like San Francisco, relatively fewer homes with large irrigated lawns or gardens. Agricultural water use statewide has declined slightly in recent decades. Numerous studies have suggested that substantial savings from water conservation, recycling, reclaimed water and other similar actions are possible. Urban conservation appears to have the greatest potential, although agricultural conservation will be needed as well. Public Policy Institute of California. February 2011. *Managing California's Water: From Conflict to Reconciliation*. Sacramento, CA.

http://www.ppic.org/content/pubs/report/R_211EHR.pdf, see Figure 2-8 and 2-0, pp. 89-90.

California Department of Water Resources. *California Water Plan: Update 2009*. Pp. 18-19.

http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/highlights_cwp2009_spread.pdf

⁸ In dry years, California gets as much as 30/40 percent of its total water supply from groundwater. Even in wet years, some groundwater basins continue to decline. In the Tulare Basin, the groundwater overdraft is approximately 1-3 million acre-feet of water per year. At some point, this overdraft has to end, and you should expect those areas to demand surface water as a replacement. Substantial evidence suggests that many of our rivers and streams are 'oversubscribed', and it is hard to imagine where replacement water will come from.

Faunt, C.C., ed., 2009, *Groundwater Availability of the Central Valley Aquifer, California*: U.S. Geological Survey Professional Paper 1766, 225 p. http://pubs.usgs.gov/pp/1766/PP_1766.pdf

⁹ See footnote 7 and Famiglietti J.S., M. Lo, S. L. Ho, J. Bethune, K. J. Anderson, T. H. Syed, S. C. Swenson, C. R. de Linage, M. Rodell. 2011. *Satellites measure recent rates of groundwater depletion in California's Central Valley*. Geophysical Research Letters, Vol. 38. <http://www.agu.org/pubs/crossref/2011/2010GL046442.shtml>

¹⁰ The cause is attributable to changes in water flow patterns, loss of habitat and a host of more specific features, currently called 'stressors'. Healey, M.C., M.D. Dettinger, and R.B. Norgaard, eds. 2008. *The State of Bay-Delta Science, 2008*. Sacramento, CA: CALFED Science Program. 174 pp. http://www.science.calwater.ca.gov/pdf/publications/sbds/sbds_final_update_122408.pdf

¹¹ See footnote 9 and Moyle P. B., J. V. E. Katz, and R. M. Quinones. 2010. Rapid decline of California's native inland fishes: *A Status assessment*. Center for Watershed Sciences and Department of Wildlife, Fish, and Conservation Biology, UC Davis, <http://californiawaterblog.files.wordpress.com/2011/09/moyleetal2011.pdf>

¹² State Water Resources Control Board, 2010. *Final Report on Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem*.

http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf

¹³ National Research Council, 2011, *A Review of the Use of Science and Adaptive Management in California's Bay Delta Conservation Plan*. http://www.nap.edu/catalog.php?record_id=13148#description.

“11.4 MAF are diverted upstream of the Delta for agricultural (83.8%), urban (15.0%), and environmental (1.2%) uses. Diversions from the Delta itself average 6.35 MAF, a little more than a third of all diversions in the Sacramento-San Joaquin system.”

Lund, J., E. Hanak, W. Fleenor, W. Bennett, R. Howitt, J. Mount, P. Moyle. 2008. *Comparing Futures for the Sacramento-San Joaquin Delta*. Sacramento, CA, http://www.ppic.org/content/pubs/report/R_207JLChapter6R.pdf

¹⁴ “The Delta, prior to the advent of European immigrants, was a vast wetlands, with seasonally flooded lands and upland lands. It hosted a vast array of water and terrestrial species. Commencing in 1850, when California joined the Union, the physical configuration of the Delta has been almost totally altered. Wetlands have virtually disappeared, replaced first by farms and in later decades by urban development, largely on the fringes of the Delta.” Moyle, P. B., J. R. Lund, W.A. Bennett, W. E. Fleenor. 2010. *Habitat Variability and Complexity in the Upper San Francisco Estuary*. Center for Watershed Sciences, University of California, Davis. San Francisco Estuary and Watershed Science, 8(3). <http://escholarship.ucop.edu/uc/item/0kf0d32x#page-1>. See also, Delta Protection Commission. 2010. *Sacramento San Joaquin Delta Primary Zone Study*. December. <http://www.delta.ca.gov/res/docs/PZ%20Final%20Report.pdf>.

¹⁵ A host of additional factors also negatively affects the ecosystem: e.g., pollution, urban and agricultural runoff and non-native invasive species --- collectively called ‘stressors’. To cap the problem, significant parts of the Delta have subsided over the decades, leaving some islands as much as 20 feet below current water levels. California Department of Water Resources. 1995. *Delta Atlas*. <http://baydeltaoffice.water.ca.gov/DeltaAtlas/index.cfm>

¹⁶ California Public Resources Code 29704.

¹⁷ Delta Stewardship Council. 2010. *Emergency Management White Paper*. ES-3. http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta_Emergency_Management_White_Paper_2011_11_08.pdf

¹⁸ Delta Stewardship Council. 2010. *Flood Risk White Paper*. ES-3. http://deltacouncil.ca.gov/sites/default/files/documents/files/Flood_Risk_White_Paper_2011_10_18.pdf

¹⁹ Delta Stewardship Council. 2010. *Delta as a Place: White Paper*. Adapted from the California Department of Conservation. 2004. *Farmland Mapping and Monitoring Program*. http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta_Land_Use_Socioeconomics_White_Paper_2011_11_08.pdf

²⁰ U.S. Department of Agriculture. 1960-2007. *Census of California Agriculture*. http://www.agcensus.usda.gov/Publications/Historical_Publications/index.asp

²¹ See, Fifth Staff Draft Delta Plan, http://www.deltacouncil.ca.gov/sites/default/files/documents/files/Fifth_Staff_Draft_Delta_Plan_080211.pdf, particularly Chapters 4 and 5.

²² See, State Water Resources Control Board background memo for its hearing titled *Water Diversion Measurement*, http://www.swrcb.ca.gov/waterrights/water_issues/programs/diversion_use/docs/workshop2011july/not_wdm07011_1.pdf

²³ A particularly interesting discussion of this overall topic is found in *Breaking the Logjam: Environmental Protection That Will Work*, 2010, David Schoenbrod, Richard B. Stewart and Katrina M. Wyman, Yale University Press. No full online copy available, abstract can be found here: <http://www.breakingthelogjam.org/CMS/index.php?cID=37>