MWD INTEREST IN DELTA CONVEYANCE

SOME CONSIDERATIONS

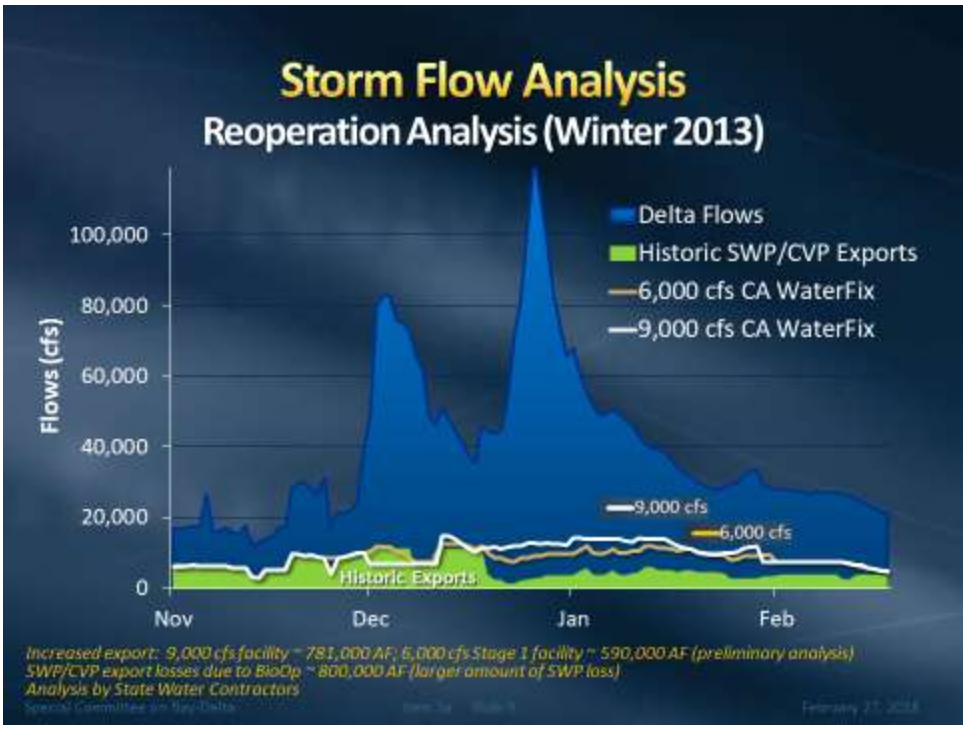
Dir. Russell Lefevre

On Wednesday September 23, Michael George, the Delta Watermaster for the State Water Resources Control Board, spoke at the Municipal Water District of Orange County (MWDOC) Water Policy Forum. He spoke about the delta as it exists and how to address a number of potential futures. One important observation he made was that in the future due to climate change, precipitation events will cause water to come in bursts that would be very expensive to capture. He referred to a sense that it would be a good idea to capture the water before it went into the ocean. He suggested that it would take a massive gulp to obtain that water and it would be very expensive. Further it would be idle most of the time, only active in the presence of an atmospheric river. This technique is not necessarily the only method to capture water coming in large, swift increments. The single tunnel Delta Conveyance is capable of capturing enough of the water coming from the Atmospheric Rivers to alleviate many drought situations.

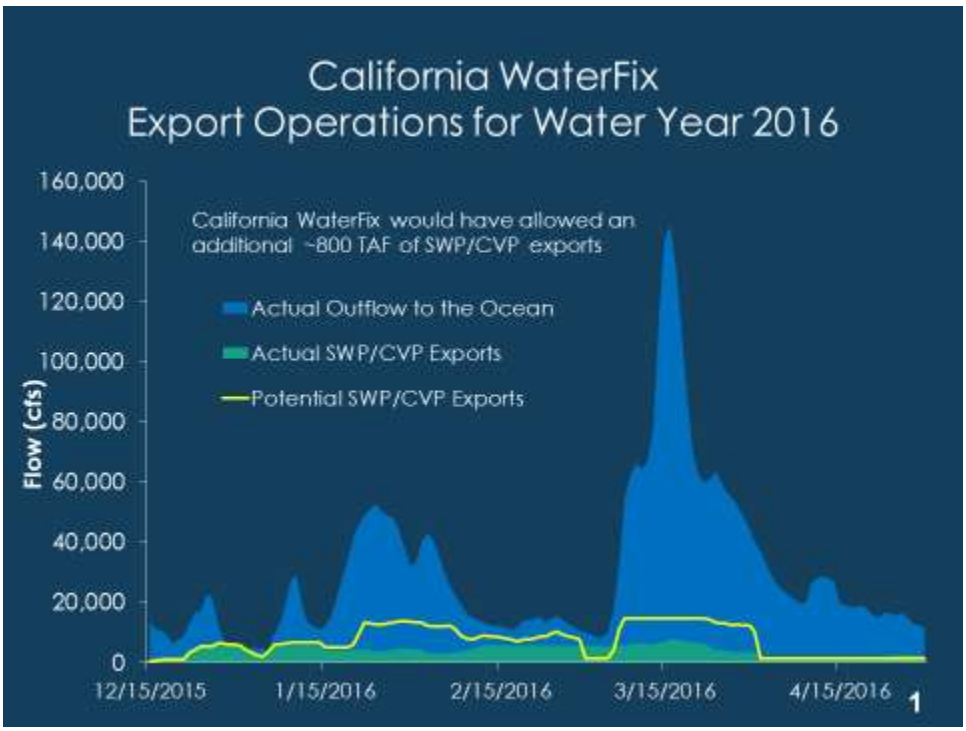
One key benefit of the single tunnel Delta Conveyance is to allow a less impactful way of diverting water under the State and federal Endangered Species regulations and at the same time improving supply reliability. This and other considerations are important and necessary to adjust to the difficult conditions from climate change. However, one element that has not received enough attention is that the Delta Conveyance would provide the State Water Project (SWP) greater capability to allow agencies to store water in wetter periods for use during drought conditions or dry times. For example, the drought of 2014 resulted in an extremely low SWP allocation of 10%. A paper published on 3 December 2014 in the journal *Geophysical Research Letters* by Griffin & Anchukaitis concludes that the 2012–2014 drought in California was its most intense in at least 1,200 years. However, on December 11 and 12, 2014 California received a major precipitation event from atmospheric rivers. These events had limited opportunity to alleviate the drought situation because the existing infrastructure is limited in capturing the large amount of flow in the Delta.

To illustrate what might be possible, the State Water Contractors did a storm flow analysis of winter periods in 2013 and 2016. The analyses for 2013 indicated that with a capacity of 6,000 cubic feet per second (cfs), a Delta Conveyance system could potentially capture about 590 TAF of the storm water. In addition, the north Delta intakes would enable the SWP to manage more effectively while still meeting Endangered Species regulations to protect fisheries (divert from the north intakes instead of the south Delta). The captured water could have made a major difference in the amount of water stored and available to help alleviate the drought conditions of 2014.

Given that the actual MWD SWP allocation was 100 TAF that year, the ability to capture supply from the northern intakes during the storm events could have added about 300 TAF for MWD (assuming MWD gets at least 50 percent of the 590 TAF storm capture).



For 2016, the analysis showed that the system could capture an additional supply from storm runoff of about 800 TAF compared to current capabilities. This analysis was done for the two tunnel 9000 cfs WaterFix. Without such infrastructure, none of that water could be captured.



The Scripps' Center for Western Weather and Water Extremes has stated that "Atmospheric river storms cause 40-60 percent of annual precipitation…" As shown above, the ability to capture a portion of that water could enable the State to withstand major drought events over significant time periods.

This indicates that even in drier times, California's hydrology would still produce Atmospheric River events with substantial precipitation and runoff. When that happens, the proposed Delta Conveyance could capture several hundred thousands of acre feet not presently available for diversion in the south Delta.

It is important to note that the hydrology is uncertain but the importance of even a single set of atmospheric river events can have a major impact. We have recently had one of the wettest years in history and at the end of the period, the MWD has the largest amount of water in storage on record. Jeff Kightlinger has stated that we can withstand as many as 5 years of drought with our present water in storage.

With global warming, the proposed Delta Conveyance infrastructure will be needed to cope with the expected acceleration of the trends in the global hydrologic cycle. "Evidence and projection show precipitation extremes will be more extreme" (1)

The authors point out that the "double whammy" effect of reduced snow (acting as storage) and significantly enhanced rain will make it more challenging for water managers to insure the reliability of water. The Delta Conveyance would provide modernized capability to capture water with atmospheric storms and will also allow the recharge of reservoirs and other storage accounts.

When looking at the importance of Delta Conveyance improvements for the SWP, it is important to examine at the same time what MWD faces with its other source of imported supply, the Colorado River Aqueduct. The 2015 IRP report estimated that the CRA would supply approximately 960,000 AF through 2040. Due to climate change it is unlikely that amount of water could be expected through 2040. Furthermore, in 2026 it will be necessary to renegotiate many conditions associated with the Colorado including the shortage criteria in the Lower Basin and the Intentionally Created Surplus program.

One recent White Paper looked carefully at the potential future in the Colorado River Basin. They examined three previous drought scenarios including the recent 2000-2018 "Millennium Drought". The article indicates the cumulative water loss compared to average conditions for this recent period was 44.08 million acre-feet over the 19 years. Other droughts indicated more loss. The authors noted that such droughts may be more likely due to the increasing effects of a warming climate. The authors included Brad Udall who has spoken to the MWD Board and was considered as a consultant to our IRP project.

The article notes that the scenarios examined are reflective of droughts that are within the range in severity of the droughts derived from climate projections. However they suggest that there could be more severe future droughts than those examined in the study.

They examined the impact of various hydrologic scenarios on lake levels. One conclusion is that under historically plausible drought situations, a considerable fraction of the scenarios and sequences indicate that the reservoir elevation of Lake Powell would fall below minimum power pool, and even in some cases below the penstock intake levels. Under that condition, there could be situations when the only

possible significant imported water would come from capturing some portion of the flow from the atmospheric rivers.

The considerations in this paper are intended to articulate my view that we need to have a long-term vision on how climate change is affecting each of our region's sources. We will need to adapt and adjust on both the SWP and Colorado River. We also will have uncertainty with our local supplies with the effects of climate change. We should be supporting the State's planning efforts to consider and evaluate those measures that make sense for the SWP.

1. Xingying Huang, Samantha Stevenson, Alex D. Hall "Future Warming and Intensification of Precipitation Extremes: A "Double Whammy" Leading to Increasing Flood Risk in California" Geophysical Research Letters/Volume 47, Issue 16 10 August 2020
2. Home Salehabadi, David Tarboton, Eric Kuhn, Brad Udall, Kevin Wheeler, David Rosenberg, Sara Gorking, John C. Schmidt "The Future Hydrology of the Colorado River Basin" The Future of the Colorado River Project White Paper No. 4, 8/31/2020