**Comments to the Central Valley Flood Protection Board**

**Water Portfolio Listening Session 6/28/2019**

I wanted to suggest a big picture framework for the Flood Protection Board on climate resiliency and the Water Portfolio.

For climate adaptation, the first priority for the state must be increasing resiliency of the existing built environment, and protecting vulnerable populations from catastrophic effects of climate change, which includes flooding.

On Tuesday, the John Muir Institute for the Environment at UC Davis held the California Extreme Precipitation Symposium. Duane Waliser from NASA's Jet Propulsion Laboratory said that Global Climate Models project that atmospheric rivers will be 25% longer and 25% wider in the future.[1] Daniel Swain has estimated that there is a greater than 50% chance of an ArcStorm like event on the Sacramento River by 2060.[2]

So the state needs to not just fund needed maintenance and rehabilitation of existing flood protection infrastructure. We need to radically change our investment priorities to fund needed upgrades of flood protection.

Christy Jones, one of Jay Lund's students, did a Master's Thesis which found that the single most effective action to increase protection of Sacramento from flooding would be widening Fremont Weir.[3] There needs to be funding for this kind of protection of our Capitol City. We also must be prioritizing funding to protect Stockton against sea level rise and increased frequency of flooding on the San Joaquin River.[4] Stockton is the

[1] 2019 California Extreme Precipitation Symposium. Presentations will be available at https://cepsym.org/.

[2] Swain, D.L., Langenbrunner, Neelin, J.D. & Hall, A.,"Increasing precipitation volatility in twenty-first-century California," *Nature Climate Change v. 8*, p. 427–433 (2018) Available at https://www.nature.com/articles/s41558-018-0140-y.epdf.

[3] Christy Jones, "Application of Optimization Modeling to Examine the Benefits of Expanding the Sacramento River Watershed Bypass System," Master's Thesis, UC Davis, 2013. Available at https://watershed.ucdavis.edu/shed/lund/students/CJonesThesis2013.pdf.

[4] Des Jardins, D., "Urban Delta – 235,000 people at risk from levee failure in Stockton area," February 27, 2017. (Updated March 1, 2019.) Available at https://cah2oresearch.com/2017/02/27/urban-delta-264000-people-at-risk-from-flooding-in-stockton-area/.

seventh largest city in California. It is past time for the state to invest in protecting it. We also need to be protecting vulnerable populations in smaller cities and rural towns.

Another major consideration is ensuring that water agencies fund needed rehabilitation to the states' aging reservoirs, and increase spillway capacities to handle the bigger inflows we will see with climate change.

San Luis Reservoir has needed seismic remediation for decades. Every time the reservoir is full, it is one earthquake away from the 300 foot tall earthen embankment slumping and causing catastrophic failure. [5] This would cause a 10 mile wide swath of destruction, 80 miles long through the San Joaquin Valley. This is the largest offstream reservoir in the nationa, and needs to be the first priority for state and federal funding.

As far as water supply projects, the state can take pro-adaptive and counter-adaptive approaches to climate change.

> Pro-adaptive approaches increase resiliency to an increasingly unstable climate.
>
> Counter-adaptive approaches expand unsustainable uses and may ultimately increase vulnerability.

Some water supply projects, as currently planned, are counter-adaptive.

One example is the Delta tunnel project. Yesterday, I explained to the Delta Stewardship Council how the performance of the proposed North Delta intakes needs to be adequately evaluated for new estimates of high sea level rise. And there has never been any simulation of the performance of the North Delta intakes with failure of the North Delta levees.[6]

It is likely that with high sea level rise and failure to maintain and upgrade the North Delta levees, that the inland sea would return as far north as Courtland. This would likely result in significant salinity intrusion during low flows on the Sacramento River.

The Delta tunnel project thus as currently conceived, could actually increase water supply vulnerability to sea level rise and droughts. There needs to be a new approach to the Delta that is more holistic, and includes protection of Delta legacy towns and critical infrastructure such as Highway 12 and Highway 4 and the Amtrak railroad tracks.

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[5] Des Jardins, D. "Full San Luis Dam endangers over 200,000 people," March 12, 2017. Available at https://cah2oresearch.com/2017/03/12/full-san-luis-dam-endangers-over-200000-people/

[6] California Water Research, "Delta Conveyance Assessment Recommendation: Re-Evaluate North Delta Intake Locations and Performance for High Sea Level Rise." Draft, June 2019. Available at https://cah2oresearch.com/wp-content/uploads/2019/07/CWR-SLR-and-2010-Intake-Loc-Eval.pdf

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