

## California Department of Transportation

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Attn: Meeting Clerk  
Delta Independent Science Board  
716 P Street, 15-300  
Sacramento, CA 95814

### **Public Comment- Review Draft Science to Inform Management of the Subsidized Lands in the Sacramento-San Joaquin Delta**

Greetings,

The California Department of Transportation (Caltrans) appreciates the opportunity to review and comment on the Delta Independent Science Board Review Draft; Science to Inform Management of Subsidized Lands in the Sacramento-San Joaquin Delta.

#### **Project Understanding**

Peat soils in the Sacramento-San Joaquin Delta have unique properties and behavior, requiring different management than other agricultural soils in California. Since the late 19th century, draining historic freshwater tidal wetlands for agricultural cultivation has caused the Sacramento-San Joaquin Delta land surface to steadily lose elevation, a phenomenon known as subsidence. Subsidence in the Sacramento-San Joaquin Delta is caused primarily by the breakdown (microbial oxidation) of organic matter in the root zone when it is dewatered. Portions of the Central and Western Delta have subsided as much as 30 feet (9 meters) below sea level.

The Sacramento-San Joaquin Delta is 0.5% of California's agricultural land but accounts for 6% of total agricultural greenhouse gas (GHG) emissions, and 21% of non-animal agricultural emissions (Deverel et al., 2020). Subsidence contributes to GHG emissions because CO<sub>2</sub> is released as aerobic microbes consume carbon in the delta soil. About half of the carbon, approximately 9.9 x 10<sup>7</sup> tons (90 Teragrams), in Delta soils have been lost since the 1800s (Drexler et al., 2019), resulting in massive GHG emissions. In the central Delta, where subsidence is most severe, the pressure on levees is expected to be much higher than in less subsided areas.

According to the State of California Sea Level Rise 2024 Guidance (OPC 2024), sea levels are likely to rise between 1.6 to 3.1 feet (0.48 meters to 0.94 meters), with an upper range projection of 6.6 feet (2.01 meters) by 2100. Without significant human intervention to reduce global warming, sea levels will continue to rise in the coming centuries. It is anticipated that ongoing sea level rise and increased riverine flooding from climate change will increase stress on Sacramento-San Joaquin Delta levees, requiring more active intervention to prevent floods. The ongoing subsidence within 500 feet of the levee crown, combined with increasing hydrologic pressure driven by

climate change (which threatens levee stability), has prompted governmental agencies and other institutions to implement 'nature-based' approaches to manage these subsided lands.

### **Key Findings**

The key findings by the Delta Independent Science Board can assist with developing strategies that will help to slow or reverse land subsidence and to reduce or reverse GHG emissions from the Delta. The research conducted if approved and implemented will help to mitigate land subsidence which includes: (1) reversing subsidence by managed wetland restoration, (2) slowing or arresting subsidence by cultivating rice, (3) developing floating tule wetlands in deeply subsided islands, and (4) designing a landscape, i.e., crop and wetland mosaics, that locates managed wetlands, rice, and other crops based on site-specific soil and hydrologic characteristics such as elevation and drainage.

This proposed policy of shifting from agriculture to managed freshwater wetlands can halt, and reverse, the subsidence process as permanent flooding prevents the oxygen (O<sub>2</sub>)-dependent microbial decomposition of organic material and thereby accretes peat from vegetation burial. Managed wetlands can reduce CO<sub>2</sub> emissions from microbial oxidation and sequester atmospheric CO<sub>2</sub> in soils. Implementing new agricultural farming management by shifting to paludiculture (such as rice) can stabilize soils as the introduction of a seasonal surface water layer which will intermittently halt the oxygen (O<sub>2</sub>)-dependent microbial decomposition of peat soils that leads to subsidence, while decreasing CO<sub>2</sub> emissions from microbial oxidation.

### **Caltrans Comments**

It is important that the recommendations align with local township and farmland master plans. A comprehensive hydrological study should also be conducted to model future water availability under various climate scenarios. This analysis should evaluate water requirements over the next 30–50 years, accounting for factors such as climate change, evapotranspiration, agricultural over-extraction, infrastructure leakage, urbanization, and shifting precipitation patterns. In addition, incorporating recycled water into the supply portfolio would provide a valuable, sustainable option to support long-term water resilience.

The breakdown (microbial oxidation) of organic matter in the root zone when it is dewatered and the acceleration of sea level rise caused by global warming associated with climate change and increased in greenhouse gas (GHG) emissions are the primary causes of the land subsidence in the Delta. The land subsidence phenomenon may be one of the contributing factors to the recent historic and perennial floods inundating the existing drainage systems in California State Routes in the Sacramento San Joaquin Delta Region, particularly in Caltrans District 10 areas. Caltrans District 10 Hydraulics strongly supports all efforts that will further investments in

the Climate Resilience Programs and the need for SHOPP funded adaptation projects in District 10 for routes affected by recent floods and future land subsidence issues in the Sacramento-San Joaquin Delta region.

Caltrans District 10 Active Transportation supports efforts to reduce GHG emissions through carbon sequestration and wetlands management and supports efforts to limit/reverse sea level rise in the Delta through sustainable practices. When viable, active transportation can play a role in limiting GHG emissions by serving as a fossil fuel-free alternative to internal combustion motor vehicles.

Additionally, it is important to collaborate with Native American Tribal partners for tribal ecological knowledge for potential future management of subsided lands and to fill alternative knowledge gaps. We also need to engage with local stakeholders, including farmers and private landowners, who are essential partners in implementing land management practices that reduce subsidence and related emissions. Meaningful dialogue with transparency, shared ideas, and agricultural conditions will strengthen trust and lead to more effective, community-supported solutions. Caltrans District 10 can play a leadership role by supporting cross-agency collaboration, advocating and promoting the use of new monitoring technologies that connect data with action. These efforts not only contribute to reducing subsidence but also enhance the resilience of transportation infrastructure and the safety of California's communities.

Lastly, Caltrans District 10 recommends that the Delta Independent Science Board continue to coordinate with Caltrans in identifying and addressing sea level rise, flooding, and land subsidence impacts to the state transportation system in the Sacramento-San Joaquin Delta Region. This will assist Caltrans in ensuring that traffic safety, and quality standards are maintained for the traveling public on existing state transportation facilities in the Sacramento-San Joaquin Delta Region.

If you have any questions or concerns, please contact Michael Casas (279) 220-1156 (email: Michael.Casas@dot.ca.gov) or me at (209) 986-4811 (email: Caleb.Brock@dot.ca.gov)

Sincerely,

A handwritten signature in blue ink, appearing to read "Caleb Brock", with a stylized flourish at the end.

Caleb Brock  
Deputy District Director  
Planning, Local Assistance, Environmental  
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bcc:

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