INFORMATION ITEM

Healthy Soils Program and Rice Cultivation in the Delta

Summary

Dr. Nina Bingham will discuss the Healthy Soils Program and its impact on the Sacramento-San Joaquin Delta (Delta), highlighting its role in climate adaptation and strategies to improve soil and lower emissions.

Background

The Delta is well known for its rich organic soils, which support an extensive agricultural industry. Historical draining and conversion from a vast tidal wetland to agricultural land has resulted in oxidation-driven subsidence (decomposition of organic material resulting in the lowering of land elevation) and threatens the Delta economy and ecosystems. The Delta is also a critically important part of the state's climate change mitigation and adaptation strategies. Drained organic soils in the Delta emit over two million metric tons of carbon dioxide-equivalent annually, representing about six percent of the state's agricultural emissions, equivalent to the amount of carbon dioxide emitted from 435,000 cars in a year.[1] Research shows that soils that are 're-wetted' can halt or reverse subsidence and soil loss and support the long-term resilience of the Delta.[2]

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[1] https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle

Deverel, S. J., Dore, S., and Schmutte, C.: Solutions for subsidence in the California Delta, USA, an extreme example of organic-soil drainage gone awry, Proc. IAHS, 382, 837–842, https://doi.org/10.5194/piahs-382-837-2020, 2020.

[2] Deverel, S.J., Ingrum, T. & Leighton, D. Present-day oxidative subsidence of organic soils and mitigation in the Sacramento-San Joaquin Delta, California, USA. *Hydrogeol J* **24**, 569–586 (2016). https://doi.org/10.1007/s10040-016-1391-1

Windham–Myers, L., Oikawa, P., Deverel, S., Chapple, D., Drexler, J. Z, & Stern, D. (2023). Carbon Sequestration and Subsidence Reversal in the Sacramento–San Joaquin Delta and Suisun Bay:

Recognizing this importance, Council staff have become involved in several relevant initiatives. These include participating in a new Delta-focused interagency carbon team, helping to host an event focused on blue carbon (carbon captured by oceans and coastal ecosystems) at UC Davis on March 5, and partnering with the National Center for Ecological Analysis and Synthesis (NCEAS) to convene an upcoming synthesis education and working group whose focus will include carbon in the Delta.

Healthy Soils Program

The Legislature established the Healthy Soils Program in 2016, and the Department of Food and Agriculture (CDFA) began implementation in 2018 to support farmers and ranchers incorporating sustainable practices into their operations, building organic carbon in the soil, and reducing emissions of greenhouse gases while improving soil health. CDFA staff are currently working on the release of a new grant solicitation utilizing funding from Proposition 4 (approved by voters in November 2024), also called the 2024 Climate Bond. Funds will be allocated as block grants to regional entities who will then coordinate awards to local farmers and ranchers to implement healthy soils practices, including, among others, Rice Cultivation in the Sacramento-San Joaquin Delta (RCSSJD). CDFA staff recently concluded a public comment period on draft solicitation guidelines and are working on responses. Additionally, CDFA staff have created a new Practice Guidelines document.[3]

Today's Presentation

Dr. Nina Bingham from CDFA will discuss the Delta's role in greenhouse gas emissions, emissions reduction, soil health, and erosion prevention and will introduce the Healthy Soils Program's work to quantify emissions associated with rice cultivation practice in the Delta. The CDFA and State Air Resources Board (CARB) reviewed scientific literature to develop RCSSJD-specific emissions factors

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Management Opportunities for Climate Mitigation and Adaptation. *San Francisco Estuary and Watershed Science*, 20(4). http://dx.doi.org/10.15447/sfews.2023v20iss4art7 Retrieved from https://escholarship.org/uc/item/97n052p9

[3] https://www.cdfa.ca.gov/oars/healthysoils/docs/HSP_2026_Practice_Guidelines.pdf

and provide preliminary implementation guidance. This process also highlighted knowledge gaps that need to be addressed to further reduce organic matter oxidation and greenhouse gas emissions in Delta soils.

Delta Plan Relationship

CARB is the state agency charged with monitoring and regulating sources of emissions of greenhouse gases. While the Council does not have direct responsibilities related to these topics, aspects of the coequal goals and Delta Plan core strategies, recommendations, and performance measures align with CARB's scoping plan for reaching the statewide greenhouse gas emissions limit, as identified in the California Global Warming Solutions Act of 2006. (Health & Saf. Code, § 38500 et seq.)

The Council has worked to address emissions and oxidation-driven subsidence through the Delta Plan and other Council initiatives. This includes, among others:

- **Delta Plan Chapter 4 - Core Strategy 3:** Protect Land for Restoration and Safeguard Against Land Loss
- **Delta Plan Policy ER P2** (Cal. Code Regs., tit. 23, §. 5006.): Restore Habitats at Appropriate Elevations
- **Delta Plan Chapter 7 - Recommendation RR R7**: Fund Actions to Protect Infrastructure from Flooding and Other Natural Disasters
- **Delta Plan Performance Measures:**
    - 4.12: Subsidence Reversal for Tidal Reconnection
    - 5.2: Subsidence Reversal and Carbon Sequestration
    - DP R07-03: State Agencies Agricultural Leases Do Not Contribute to Land Subsidence
    - DP R07-02: Develop Plan and Funding for Carbon Sequestration Projects
    - DP R10-01: Encourage Habitat Enhancement and Wildlife-friendly Farming Systems
- **Delta Adapts:** Addressing greenhouse gas emissions and subsidence through key strategies that prioritize subsidence halting and reversal on subsided lands
- **Delta Science Program Research Awards:** Improving Subsidence and Carbon Emissions Modeling (2025)

Fiscal Information

Not applicable

List of Attachments

No attachments

Contact

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A recording of the presentation will be available on the Delta Council's YouTube page at https://www.youtube.com/@DeltaCouncil.