Providing Science to Inform Restoration Efforts Considering Climate Change for the San Francisco Bay-Delta Estuary

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The San Francisco Bay-Delta estuary has ambitious plans to maintain and restore over 130,000 acres of wetlands to provide habitat for protected species, flood protection, recreation opportunities, and carbon sequestration. However, given a changing climate and sea-level rise these goals have become uncertain. The estuary is experiencing about 2mm/yr of sea-level rise, along with changes in freshwater availability from prolonged droughts which reduce the amount of freshwater flow into the estuary. Managers and policy makers need information about how to maximize tidal wetland resilience and meet restoration goals considering these climate stressors. To meet these science needs we have conducted sea-level rise vulnerability assessment that have been used to prioritize restoration locations and accelerate restoration and enhancement timelines. Also, sediment studies have been done to answer key questions regarding sediment availability to build wetland elevations relative to sea levels. Then to understand how restoration can help meet California's greenhouse gas reduction goals studies about carbon sequestration have been done. Lastly, these studies have been scaled up to inform a Wetland Regional Monitoring Program that is implementing a long-term monitoring program to track change in the estuary. Using local studies to inform a regional monitoring program helps reduce uncertainty and informs restoration approaches to maintain wetlands over the coming years. I will present on a variety of research projects and how results from those have informed tidal wetland restoration and monitoring approaches.

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