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Assessing Mechanisms and Rates of Levee Erosion in the Sacramento-San Joaquin Delta

ABSTRACT

This presentation is an overview of a decadal research project designed to assess the impacts of boat wakes on delta levees, with emphasis on the influence of vegetation. We have been monitoring horizontal and vertical levee and bank change at 40 sites, distributed across the delta, four times per year. The sites were selected to represent a variety of process environments. For the length of record, average horizontal erosion for all sites has been 0.13 m/yr, while vertical erosion has averaged 0.03 m/yr, with many sites showing seasonality in change rates. We have monitored boat traffic, recording boat speed, length, and wake characteristics, and cumulative banks effects, to understand the mechanics of wake-bank interaction. We have mapped and categorized 800 miles of levee bank, finding that at the water line, about 50 miles are considered treed, another 65 miles are vegetated, and about 75 miles are exposed bank. We have also measured the attenuation of boat wake energy by brush bundles and tule stands. A summary of our principle findings from these studies will be made, supporting the concept that levee erosion is slowed by the presence of vegetation.

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Dr. Douglas J. Sherman is a Professor of Geography and Head of the Department of Geography at Texas A&M University. Previously he was the Director of the Sea Grant Program at the University of Southern California. He holds a Ph.D. in Geography from the University of Toronto and was a postdoctoral scholar in Ocean Engineering at Woods Hole Oceanographic Institution. He has held visiting positions at the Queen's University of Belfast, Universities of Auckland and Sydney, the Australian Defence Force Academy, University College, Cork, the University of Amsterdam, and the University of Minho. He is a Fellow of the American Association for the Advancement of Science and a member of their Committee for Geology and Geography, and the Chair of the Commission on Coastal Systems of the International Geographical Union. He has twice been a Fulbright Senior Scholar. Professor Sherman's research expertise is in nearshore processes and sediment transport in coastal, estuarine, and aeolian systems. He has produced more than 100 publications, and his research has been supported by NSF, NOAA, Sea Grant, National Geographic Society, National Park Service, California Department of Boating and Waterways, and the California Coastal Conservancy.