NCTS# 35760-18 Bay Delta Science Conference ABSTRACT

Using Remote Sensing to Assess of Growth and Distribution for Floating Invasive Plants and Growth Response Times to Altered Environments

Dr. David L. Bubenheim
National Aeronautics and Space Administration-Ames Research Center (NASA-ARC)
Earth Science Division, Biospheric Science Branch
Phone: 650-604-3209
David.L.Bubenheim@NASA.GOV

Management of aquatic weeds in complex watersheds and river systems present many challenges to assessment, planning and implementation of management practices for aquatic invasive plants. The Delta Region Areawide Aquatic Weed Project (DRAAWP), a USDA sponsored area-wide project, is working to enhance planning, decision-making and operational efficiency of invasive plant management in the California Sacramento-San Joaquin Delta. Satellite and airborne remote sensing are used to map area of plant coverage and estimate biomass density to aide operations and assess management impacts on plant communities. Modeling at local and watershed scales using the SWAT modeling tool provides insight into land-use effects on water quality. Environmental variability in the Delta occurs across a range of time scales from long-term climate and seasonal trends to short-term water flow mediated variations. Controlled environment growth studies have been conducted to quantify the growth response of invasive aquatic plants to water quality and other environmental factors. Response time for invasive species response are examined at time scales of weeks, day, and hours using a combination of study duration and growth assessment techniques to assess water quality, temperature (air and water), and light effects. These provide response parameters for plant growth models in response to environmental variation and interact with management and economic models associated with aquatic weed management. Plant growth models are to be informed by remote sensing and applied spatially across the Delta to balance location and type of aquatic plant, growth response to altered environments and phenology. Initial utilization of remote sensing tools developed for mapping of aquatic invasive plants improved operational efficiency in management practices. These assessment methods provide a comprehensive and quantitative view of aquatic invasive plant communities in the California Delta.