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**Title:**

Growth Response of Water Hyacinth to Environmental Ranges in the California Sacramento-San Joaquin River Delta.

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**Abstract:**

Management of aquatic weeds in complex watersheds and river systems present many challenges to assessment, planning, and implementation of management for aquatic invasive plants. The Delta Region Areawide Aquatic Weed Project (DRAAWP), a USDA sponsored area-wide project including NASA Ames Research Center and State of California Department of Boating and Waterways, is working to enhance decision-making and operational efficiency of invasive plant management in the California Sacramento-San Joaquin Delta. Expansion of invasive aquatic plants has been detrimental to water management and the ecosystem complex in the San Francisco Bay/California Delta. The portion of DRAAWP reported here focuses on parametrizing the environmental response inputs for the Delta models for prominent invasive aquatic plants. Changing climate, long-term drought, shifts in land use, and variation in water flow and quality from input watersheds lead to wide and unique variation in environmental conditions. Environmental variability occurs across a range of time scales from long-term climate and seasonal trends to short-term water flow mediated variations. Response of invasive aquatic plants are examined using controlled environment growth facilities at time scales of weeks, day, and hours using a combination of study duration and growth assessment techniques to assess water quality, temperature, nutrient, and light effects. These provide response parameters for plant growth models in response to the variation and interact with management and economic models associated with aquatic weed management. Plant growth models are 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.

**Key Words:** Growth Response, Water, Hyacinth, Environmental, Ranges, California, Sacramento-San Joaquin River Delta.