ECOLOGICAL MANIFESTATIONS OF PHOSPHORUS ENRICHMENT IN THE ST. JOHNS RIVER, FLORIDA

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The St. Johns River drains northeast Florida, and is composed of large flow-through and off-line lacustrine segments with sufficient residence time in spring and summer to promote phytoplankton community expansion. If growth resources are sufficient, bloom proportions are achieved, and because phosphorus supply exceeds bioavailable silica and nitrogen, these blooms in the river's freshwater segments are dominated by cyanobacteria. Delivery of the external phosphorus load occurs primarily during fall and winter when saturated soil conditions favor desorption and migration from ephemerally-connected near-stream source areas. This delivery is temporally disconnected from peak phytoplankton growth seasons, but nonetheless is effective for baseline production in the spring by resupplying transient sediment phosphorus inventories. Niches formed by hydrodynamic and chemical interactions tend to select for specific cyano-HAB communities and successional patterns. The near elimination of point-source effluent loads to the river has significantly reduced average phytoplankton standing stock and cyanobacteria relative abundance, though unseasonable pulses of nutrient-rich non-point source external load can enhance and reposition blooms, and now constitutes the primary cyano-HAB set-up scenario. *Microcystis* appears to be the primary benefactor of this pattern. This genus also tends to thrive in a niche endemic to the St. Johns arising from low N:P and high colored dissolved organic matter. The combination of increased phosphorus loading to the landscape and future predicted regional shifts in temperature and the timing and intensity of rainfall has the potential to increase the frequency of the suite of factors favoring the dominance of this HAB genus in the river's freshwater reaches.

PRESENTER BIO: John Hendrickson is an Environmental Scientist and Supervisor of the Aquatic Systems Section of the SJRWMD Bureau of Water Resources, and is involved in evaluation of TMDL restoration progress, water quality impacts to habitat and designated use achievement, and design of monitoring, analysis and modeling to evaluate cost-effective management alternatives.