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# Are Harmful Algal Blooms Becoming the Greatest Inland Water Quality Threat to Public Health and Aquatic Ecosystems?

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## ABSTRACT

Abstract—In this Focus article, the authors ask a seemingly simple question: Are harmful algal blooms (HABs) becoming the greatest inland water quality threat to public health and aquatic ecosystems? When HAB events require restrictions on fisheries, recreation, and drinking water uses of inland water bodies significant economic consequences result. Unfortunately, the magnitude, frequency, and duration of HABs in inland waters are poorly understood across spatiotemporal scales and differentially engaged among states, tribes, and territories. Harmful algal bloom impacts are not as predictable as those from conventional chemical contaminants, for which water quality assessment and management programs were primarily developed, because interactions among multiple natural and anthropogenic factors determine the likelihood and severity to which a HAB will occur in a specific water body. These forcing factors can also affect toxin production. Beyond site-specific water quality degradation caused directly by HABs, the presence of HAB toxins can negatively influence routine surface water quality monitoring, assessment, and management practices. Harmful algal blooms present significant challenges for achieving water quality protection and restoration goals when these toxins confound interpretation of monitoring results and environmental quality standards implementation efforts for other chemicals and stressors. Whether HABs presently represent the greatest threat to inland water quality is debatable, though in inland waters of developed countries they typically cause more severe acute impacts to environmental quality than conventional chemical contamination events. The authors identify several timely research needs. Environmental toxicology, environmental chemistry, and risk-assessment expertise must interface with ecologists, engineers, and public health practitioners to engage the complexities of HAB assessment and management, to address the forcing factors for HAB formation, and to reduce the threats posed to inland surface water quality. Environ Toxicol Chem 2016;35:6–13. # 2015 SETAC