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2017 John R. Freeman Lecture

Lake Erie's Death, Resurrection, Re-Death, and the Role of Multiple Models in Setting and Guiding New Nutrient Loading Goals for a Re-Resurrection

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Thursday, April 13, 2017
Reception 6:00 PM; Lecture 7:00 PM

Massachusetts Institute of Technology
Tang Center (Building E51)
70 Memorial Drive, Cambridge, MA 02139

Abstract:
Reducing phosphorus (P) loading is a key management tool for controlling Lake Erie eutrophication. During the 1960s and 1970s, increased phosphorus inputs degraded water quality, stimulated algal blooms, and reduced central basin hypolimnetic oxygen to levels that eliminated thermal habitat vital to cold-water organisms and contributed to the extirpation of important benthic macro invertebrate prey species. In response to load reductions initiated in 1972 under the US/Canada Great Lakes Water Quality Agreement (GLWQA), Lake Erie responded quickly with reduced phytoplankton biomass and bottom-water hypoxia. However, since the mid-1990s, cyanobacteria blooms and hypoxia returned to conditions of the 1970s. In response, a renegotiated GLWQA required the governments to revise P load targets once again.

Using multiple models, we recommended new loading targets to avoid severe cyanobacteria blooms and reduce hypoxia, and those recommendations guided the new binational agreement of an additional 40% P load reduction. Subsequently, we assembled five additional modeling groups to assess load reduction strategies for the agriculturally-dominated Maumee River watershed, the single largest P contributor to Lake Erie toxic algal blooms. While several potential pathways are available to achieve the new target loads, results show that any successful pathway will require significant large-scale implementation of multiple practices.

Registration:
This is a free event.
To register online click here, or you may register at the door.