

Environmental Engineering Seminar

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Toward New Age Modeling and Management of Nuisance *Cladophora* in the Great Lakes

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A native to the Great Lakes, *Cladophora glomerata* is a filamentous, green alga that has proliferated and caused nuisance conditions especially in the lower Great Lakes, both historically and in the 21st century. Depending on currents affected by wind speed and direction, algal mats may clog cooling and drinking water intakes or wash up on beaches. The decaying plant material produces offensive odors and provides favorable environmental conditions for hosting pathogens. While *Cladophora* was not the target for P abatement, which began in the late 1970s, its biomass levels appeared to decrease by the early to mid-1980s in Lake Ontario. With the return of nuisance conditions since the zebra and quagga mussel invasion and an altered system at hand, current field monitoring and modeling efforts are necessary to establish a new baseline understanding and appropriate management approaches in this new age. The objectives of this dissertation will be 1) to establish that there has, in fact, been a *Cladophora* resurgence in the Great Lakes and to quantitatively characterize that resurgence and management implications, 2) to define a phosphorus standard or substance objective for *Cladophora* management in the Great Lakes; and to demonstrate the application of linked hydrodynamic-phosphorus-*Cladophora* modeling to define management strategies in two case studies, 3) the Ajax, ON nearshore of Lake Ontario and 4) the eastern basin of Lake Erie.

