Burrowing Mayfly (*Hexagenia*) Range Expansion and Life History in Western Lake Erie.

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Hexagenia disappeared from western Lake Erie in the 1950s. Adult *Hexagenia* were observed at isolated locations in 1991 following 20 years of reduced phosphorus inputs and the invasion of zebra mussels. Semi-annual benthic surveys have documented range expansion of *Hexagenia* larvae from west to east, and two- to four-fold annual increases in density, to >2,000 larvae/m2 at some sites in 1997. Numbers declined in many locations in 1998. Since 1994, adult *Hexagenia* have been observed throughout western Lake Erie but in only isolated shoreline locations in central or eastern basins. Continued absence of larvae north of Pelee Island and south of Middle and East Sister islands suggests benthic conditions may be limiting recovery in some regions. Sediment cores from areas both with and without larvae revealed presence of apparently viable eggs. Size frequency distributions of larvae in May (before emergence) of each year reflect time since site colonization. Areas apparently colonized within one year harboured almost exclusively large larvae. Sites colonized for 2 or more years exhibited distinct size bimodality or only smaller larvae. Possible explanations are 1) density-dependent effects pertain; 2) eggs may become buried to anoxic depths in sediments (arresting development) and subsequently re-exposed by either a) wave-action; or b) bioturbation activity of larger larvae. Any of these mechanisms may reduce or delay growth, and ultimately impose a two-year life cycle.