

2003

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## Recommended Citation

Gonke, Amy L., "Aquatic Insect Communities, Littorial Habitats and Shoreline Characteristics in Eastern South Dakota" (2003). *Oak Lake Field Station Research Publications*. 6.  
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# **AQUATIC INSECT COMMUNITIES, LITTORAL HABITATS AND SHORELINE CHARACTERISTICS IN EASTERN SOUTH DAKOTA**

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## **ABSTRACT**

Recently, biological monitoring has become an important part of state water quality protocols, but few studies have focused on invertebrate community attributes within littoral zone habitats. The objective of this study was to define relationships between insect community attributes, littoral habitat and shoreline characteristics. Random locations within the littoral zone were sampled from seven basins during June to August 2001-2002. Six significant associations were found between invertebrate metrics and habitat measures from the combined lake data set ( $n=160$ ). Percent Odonata was positively associated with percent canopy and negatively associated with cobble/boulder substrate ( $\rho=0.29$  and  $-0.30$ , respectively) while percent Corixidae was positively correlated with cobble/boulder substrate ( $\rho=0.31$ ). Percent filters and Tanytarsini were positively correlated with macrophyte wet biomass ( $\rho=0.39$  and  $0.35$ , respectively) while percent sprawlers was positively correlated with percent macrophyte cover ( $\rho=0.30$ ). Of these six correlations, none were consistently significant within all individual basins and only two were above the critical value necessary for significance ( $\rho=0.34$ ) within individual basins. Two hundred significant insect versus habitat associations were found within individual lake basins ( $n=20-25$ ). Total richness, percent Hemiptera, percent Coleoptera, percent Ephemeroptera, percent climbers, percent predators and percent clingers were significantly associated with habitat within five or more of our individual study basins. These results reveal the individual character of prairie lake basins through associations between insect community and habitat attributes. Those metrics consistently and significantly associated with habitat among several basins within a region provide focus for development of an index of biotic integrity for northern prairie lakes.