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AQUATIC INVERTEBRATE COMMUNITIES AND BIOMONITORING: THE IMPORTANCE OF TAXONOMIC RESOLUTION

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ABSTRACT

Invertebrates have long been monitored to evaluate water quality and habitat conditions within lakes and streams. However, limited expertise and funding has prompted managers and their consultants to simplify identifications which may undermine resource management efforts. This analysis was conducted to (1) summarize taxonomic composition and ecology of eastern South Dakota aquatic invertebrate communities and (2) evaluate differences in biomonitoring metrics resulting from different levels of identification. Invertebrate data were drawn from studies of 16 streams, six seasonal prairie potholes and eight semi-permanent prairie pothole basins sampled during five separate research efforts over a ten year period. While some differences in methodology were employed among studies, sweep nets were used in all but one study. Smaller streams and pothole basins in eastern South Dakota characteristically support high numbers of Diptera, Coleoptera and Hemiptera (Insecta), Euhirudinea and Oligochaeta (Annelida) and Hydracarina (Acari). Some of these taxa are more difficult to identify but may comprise over 50% of collected genera and more than 90% of total invertebrate numbers. In particular, the midge family Chironomidae is represented by genera varying significantly in their tolerance to organic pollution, functional feeding guilds and habit utilization guilds. Thus, intermediate taxonomy at the order or family level may eliminate more than 50% of taxonomic richness and reduce guild and pollution tolerance variability useful for delineating water quality and habitat patterns. These altered patterns may, in turn, lead to inappropriate management prescriptions for our lakes and streams.