

State of Wisconsin Joint Solicitation of Groundwater and Related Research/Monitoring Proposals for Fiscal Year 2006

Proposal Number: 06-GSI-09

Title: Assessing the Ecological Status and Vulnerability of Springs in Wisconsin

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Abstract: The need for a clear understanding of the ecological status of springs provides the overall motivation for this proposal. The current understanding of springs ecology in Wisconsin and elsewhere is limited (Springer et al., in prep.), while the ecology of lakes (Wetzel, 1983), streams (Giller and Malmquist, 1998), and wetlands (Mitsch and Gossilink, 1993) has been extensively studied. The topic is relevant in Wisconsin because the State has taken steps to protect springs that result "in a current of flowing water with flows of a minimum of one cubic foot per second at least 80 percent of the time" (2003 WI Act 310, p.2); the Wisconsin Department of Natural Resources is now charged with evaluating whether groundwater pumping by new high-capacity wells will impact these springs. Using a comprehensive springs classification system that is being developed by Springer et al. (in prep.) we will describe and document the physical, biological, and sociocultural characteristics of typical spring systems in the glaciated and unglaciated regions of the State. This will allow us to make assessments of the ecological status of typical spring systems, which is a critical first step in assessing vulnerability to pumping because it provides baseline conditions to which changes can be compared. To further address the issue of vulnerability, we will formulate viable hydrogeological conceptual models of the typical spring systems, which may be useful for modeling studies if wells are proposed in the future. In addition, we will identify ecological functions of typical spring systems that may be vulnerable to changes induced by altered flow regimes, thereby stressing dependent biota. All spring data will be recorded and managed in a springs GIS, which will help to address the lack of a central database for springs information.

Work Location: Iowa and Waukesha Counties, Wisconsin

Year 1 Budget: (2005-2006) \$32,790

Year 2 Budget : (2006-2007) \$30,813