

OK NSF Established Program to Stimulate Competitive Research | September 2017

Since

groundwater

groundwater

replenished naturally, understanding

the distribution and connectivity of

appropriate management and effective

Funding for this project was

provided by the National Science

Foundation under Grant No. OIA-

are

conservation of this resource.

is

essential

only

for

## Predicting Oklahoma Groundwater Hydrology Using Isopod Distributions

Groundwater is one of the most important natural resources especially in areas where water availability is Groundwater sparse. plays an important role in supporting agriculture, industries, and other services for a community. water Oklahoma has experienced major droughts, which can significantly impact the groundwater resources since groundwater can be used as a supplemental or alternative water source for irrigation as well as for domestic and public use.

Measuring available ground-water is a function of recharge and withdrawal rates, and measuring both requires accurate delimitation of



Ron Bonett



aquifer borders. Hence, OK NSF EPSCoR researcher, Dr. Ron Bonett and doctoral student Alex Hess of the University of Tulsa, are leading an effort to predict ground water hydrology of the

Ozark aquifers in Northeastern Oklahoma. These researchers are utilizing distributions of isopods (a group of crustaceans) as a means to figure Ozark hydrology and water quality, and to delineate watershed boundaries. Genetic boundaries of species can be indicative of physical barriers to dispersal. Groundwater isopods are abundant in the Ozarks and are restricted to aquatic systems, so their distributions may reflect hydrologic connectivity and discontinuity within the system.

"Our study will entail analyzing the genetic distributions of these native groundwater animals as a tool for mapping the borders the aquifer of systems," Bonett said. "We will also use the distribution and abundance of isopods to evaluate water quality in the region. Thus far we

have identified several types of

distinct surface and subterranean aquatic isopods in the Oklahoma Ozarks, with genetic distributions that follow geography and geology. This suggests that this system is very promising for delineating fine-scale barriers in isopod distributions, which may track hydrologic boundaries," Bonett added.

Aquatic isopods (*Lirceus*) congregating at night.

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