



Cecil Boswell

DYEING TO FOLLOW THE WATER

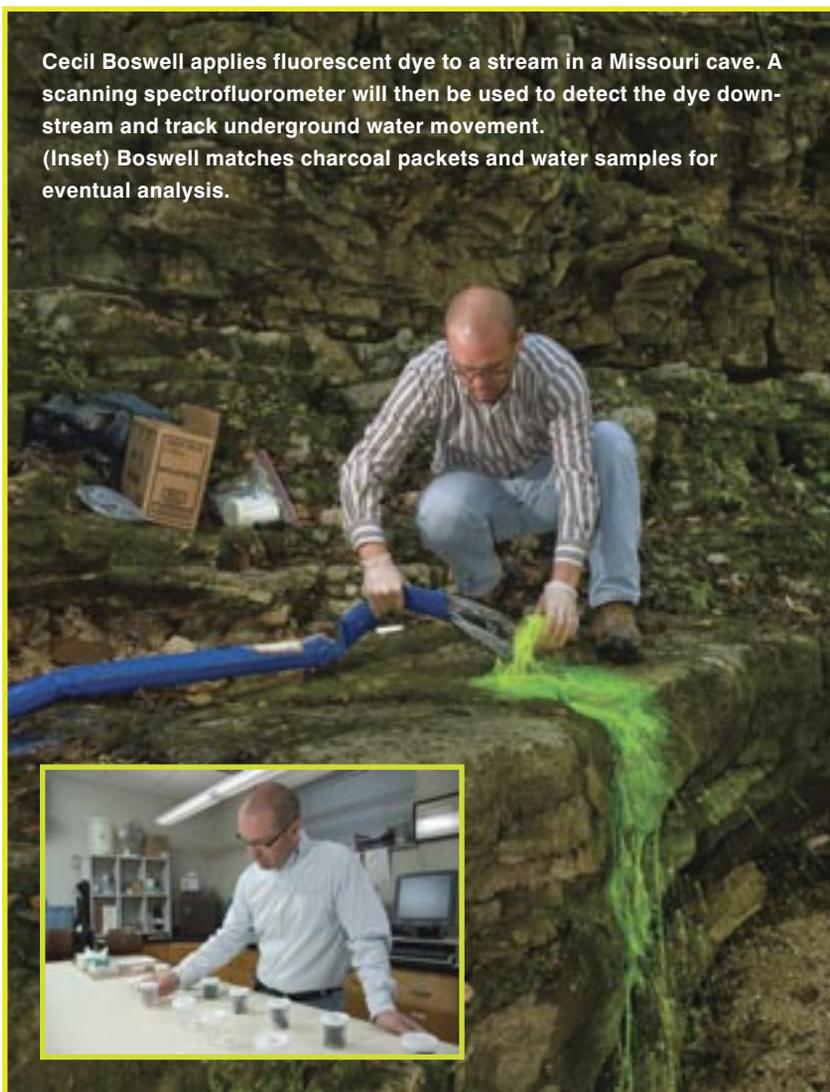
by Hylan Beydler
photographs by Scott Myers

Imagine several sparkling streams run through your farm and one of the streams disappears into the ground (known as a losing stream). Additionally, a large cave exists under your property. Filled with fragile cave fish and salamanders, the ceiling of the cave often drips water in various places, forming pools on the cave floor. One Sunday, after returning with your family from church, you notice the water in one stream is very cloudy and appears to be polluted. If it is polluted, how would you determine where the water is going and whether the water from your streams enters the cave?

The answer is bugs! Yes, “bugs” could help solve the mystery. However, these bugs are not your garden variety. They are neither living things nor electronic listening devices – they are water tracing bugs, a.k.a. activated charcoal packets that absorb specialty dyes. Bugs are just one component of the arsenal of tools and technology used to protect the environment by Cecil Boswell, a technical assistant with the Missouri Department of Natural Resources’ Division of Geology and Land Survey’s Environmental Assistance Unit.

Boswell, a Provencal, La., native who works alongside geologists, was part of a team that recently placed non-toxic fluorescent dye in streams that may flow into Onondaga Cave. A National Natural Landmark that is open to the public, the cave is in Onondaga Cave State Park near Leasburg. Deep underground, a world exists that continues to change as water forms dripping stalactites, husky stalagmites and many other colorful deposits. The team conducted research using charcoal packets, along with state-of-the-art technology known as a SCUFA™ (Self-Contained Underwater Fluorescence Apparatus).

Cecil Boswell applies fluorescent dye to a stream in a Missouri cave. A scanning spectrofluorometer will then be used to detect the dye downstream and track underground water movement. (Inset) Boswell matches charcoal packets and water samples for eventual analysis.



“A SCUFA is a highly accurate, versatile, submersible fluorometer, a device used to measure dye, water temperature, and other characteristics of water as it passes through the device. Our SCUFA was brand new and we were testing ourselves as much as we were testing it on its maiden voyage,” said

A submersible spectrofluorometer is secured in a Missouri stream to help Cecil Boswell measure various environmental conditions in the water that passes through the device.

(Inset) The charcoal packets absorb waterborne dyes to determine the movement and characteristics of specific bodies of water.

Boswell, who had spent significant time in the office, acquainting himself with the SCUFA's hardware and its new accompanying computer software.

Many people rely on wells for their drinking water. The underground movement of water through caves and bedrock fractures is studied to prevent those wells from becoming polluted, in addition to identifying potential well pollution sources.

Besides completing water traces, Boswell also provides technical assistance to industry and researchers who are conducting other water traces. The department is responsible for the Missouri Water Trace Laboratory and the water traces performed within the state.

"Water tracers contribute to and use this database to aid them in their own traces," said Boswell.

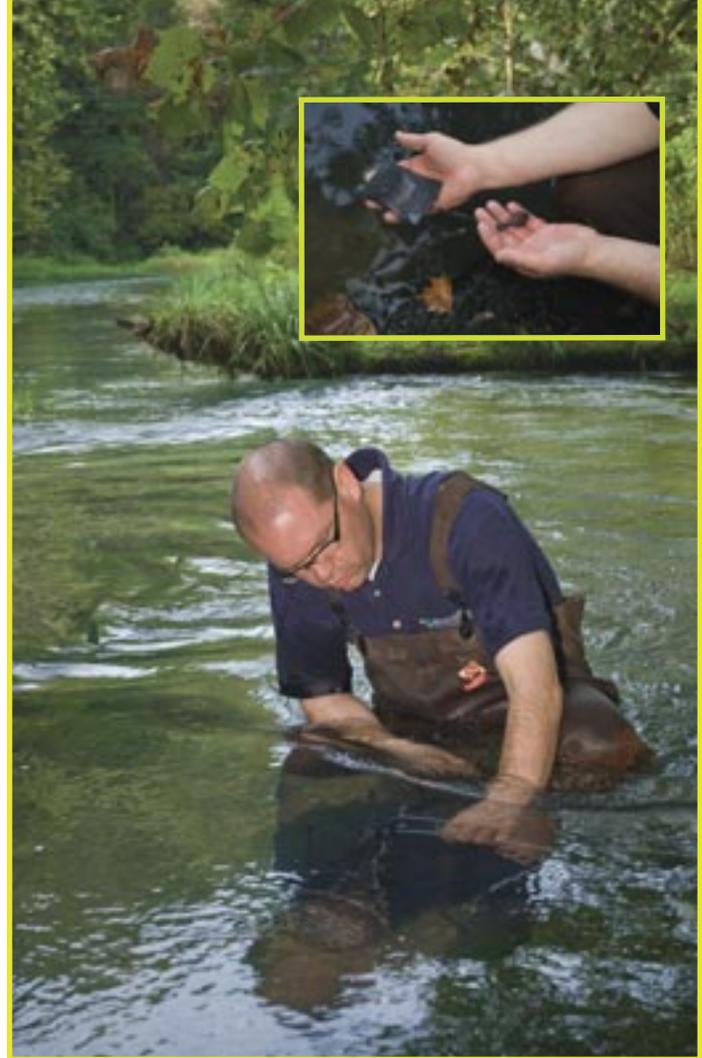
He pinpoints locations collected by himself and others using a geographical information system. The GIS coverages are made available by the department to the public free of charge at the University of Missouri-Columbia's Missouri Spatial Data Center [msdis.missouri.edu/].

Boswell, who began his career in Rolla in 1996, may also be found assisting at sites of sinkhole collapse, illegal dump sites, wastewater treatment facilities, domestic waste lagoons and other geological and hydrological concerns.

Having recently completed a geology class at East Central University in Union, Boswell is continuing his education in business administration.

"I enjoy my job. It is rewarding knowing my work contributes to the good health of citizens and the protection of our environment." He especially likes his variety of duties, of which there is a good mix of field and office work.

"I have seen interesting regions of Missouri including many of her beautiful springs, hills and rock formations. The fact that I have been able to see most of our



state, including each corner and several points in between, is icing on the cake."

There are several areas of expertise to consider for a career with the department as a technical assistant, including assisting engineers, land surveyors, geologists, or hydrologists. Most require a high school diploma or GED and may demand four or more years of experience in drafting, computer-aided drafting or on-the-job training.

Other candidates include persons holding a bachelor's degree with a minimum of 15 earned credit hours in one or a combination of the following: drafting, engineering, engineering technology, geology, hydrology, earth science, geophysics, statistics or advanced mathematics.

Certain related training and experience may be substituted on a year-for-year basis for the required experience and education. For more information about career opportunities with the State of Missouri, visit [mo.gov/employment].

Hylan Beydler is division information officer for the department's Division of Geology and Land Survey.