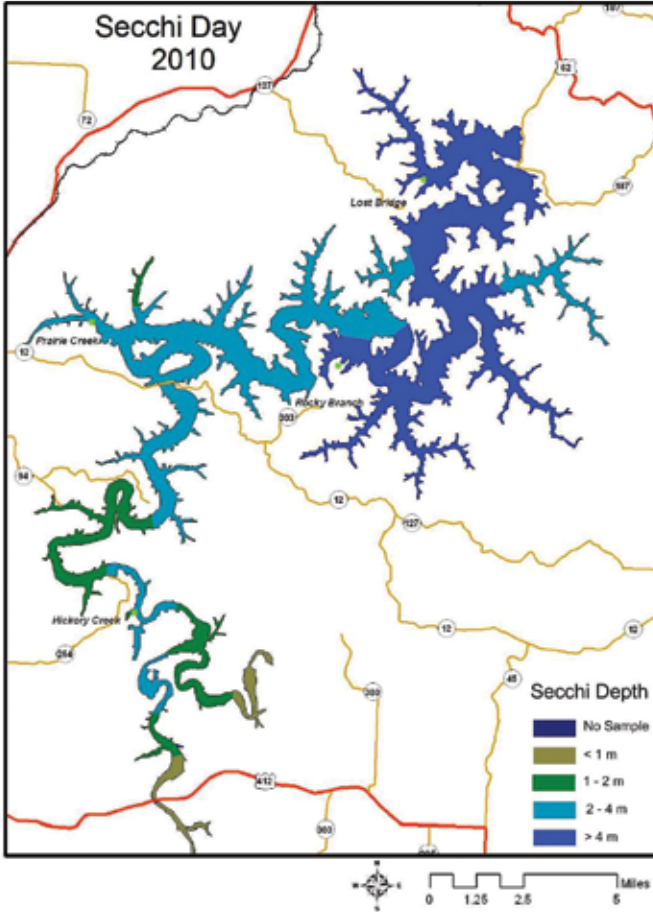


# THE SOURCE



The Source is a quarterly publication of Beaver Water District Winter 2010

## Secchi Day Results



*Beaver Lake exhibited a gradient of increasing Secchi depth from its headwaters to the dam. Lowest Reading: .5 m @ site 33, War Eagle arm  
Highest Reading: 5.5 m @ site 29, near the dam*

Once a year for the past five years, Beaver Lake has had an annual physical exam. And it's all thanks to volunteer scientists who take time out on a Saturday to help with the effort during Secchi Day on Beaver Lake, held in August each year.

"Our dedicated citizen scientists are the heart and soul of Secchi Day," said Dr. Robert Morgan P.E., Manager of Environmental Quality for Beaver Water District. "It simply wouldn't be possible for one or two people to get this many measurements in one day. I don't have enough lab technicians to get this many measurements done in a single day."

More than 300 people participated in the 5th Annual Secchi Day on Beaver Lake on Aug. 21. The event was co-sponsored by Beaver Water District, Audubon Arkansas, the U.S. Army Corps of Engineers-Beaver Lake, the U.S. Geological Survey, the University of Arkansas Cooperative Extension Service, Arkansas Master Naturalist, Hobbs State Park, and the Association for Beaver Lake Environment.

Morgan noted that thanks to volunteers, the District will have a whole decade of annual snapshots of Beaver Lake by 2015.

"This long-term data collection will allow us to evaluate trends in Beaver

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*Secchi Day Results* continued from page 1

Lake,” he said. “This is of great importance, since Beaver is the primary drinking water source for one in eight Arkansans.”

Secchi depth is a measure of water transparency that involves lowering a black and white disk into the water and recording the measurement when the disk is no longer visible. Deeper depths indicate water that is clearer than shallower depths. Secchi measurements this year ranged from .5 meters (1.6 feet) in the War Eagle arm of the lake to 5.5 meters (18.04 feet) near Beaver Dam.

In addition to Secchi depth readings, volunteers also collect water samples. Then Beaver Water District’s lab technicians measure chlorophyll a, total phosphorous, and nitrate in each of the water samples. Chlorophyll a is a pigment in algae that is used to measure the density of the algal population in water. Phosphorous and nitrate are both nutrients that promote algal growth.

“Phosphorous from fertilizer and other sources attaches to soil particles. Storm water runoff carries with it a lot of soil particles and phosphorous. This is what is meant by the term ‘non-point source water pollution,’ ” Morgan said.

“This long-term data collection will allow us to evaluate trends in Beaver Lake,” he said. “This is of great importance, since Beaver is the primary drinking water source for one in eight Arkansans.”

He added that the object is to reduce the amount of phosphorous entering Beaver Lake. It’s important to educate

residents about how phosphorous enters the lake. Examples include fertilizer runoff from lawns, erosion from unpaved county roads, and erosion from stream banks. Additionally, where residents have cleared stream side vegetation (also known as riparian buffers) it is easier for the banks to erode. Eroding

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banks contribute sediment to the stream and degrade the water quality.

“All of these activities can negatively impact water clarity and water quality in Beaver Lake,” he said. “The District and its partners in Secchi Day are committed to educating the community about best management practices that will curb impacts from these activities and protect the lake’s water quality. After all, Beaver Lake is our drinking water. And abundant, high quality drinking water is necessary for good health. It’s also essential for a strong economic base and for quality of life for Northwest Arkansans.”

A detailed Secchi Day 2010 Report with graphics may be accessed via the Beaver Water District website at [www.bwdh2o.org](http://www.bwdh2o.org). Next year’s event will be held on Aug. 20, 2011. For more information, visit [www.bwdh2o.org](http://www.bwdh2o.org).

# Infrared Thermography: Valuable Tool for District

Infrared thermography or thermal imaging utilizes an electronic device to see heat patterns. This allows the user to identify potential problems with overheating. The device creates an image to let the user see something that he cannot see with the naked eye.

Thermal imaging cameras detect radiation in the infrared range of the electromagnetic spectrum and produce images of that radiation. Infrared radiation is emitted by all objects near room temperature. That means that thermography makes it possible to see objects in the environment with or without illumination.

“When problems are identified proactively, then money is saved and there’s less chance that there will be disruptions in the drinking water plant,” said Alan D. Fortenberry P.E., CEO of Beaver Water District.

On Oct. 20, Damon Hoops, an electrician with the District, shared information about infrared imaging with about 75 colleagues attending the monthly meeting of the Northwest District of the Arkansas Water Works and Water Environment Association, held in Eureka Springs. Hoops presented the information via a multimedia PowerPoint slide show with animation created by Cassandra Roberts, also of Beaver Water District.

“Infrared helps us locate problems in their early stages before they can be seen by other means,” said Hoops. “Electrical applications for thermal imaging at our drinking water facility include distribution systems, transformers, connections, conductors, and motor control systems.”

Mechanical applications include motors, compressors, cooling systems and tanks, and building applications

include walls, windows, insulations, doors, and roofs.

After explaining to the audience how thermal imaging works, Hoops added that “seeing a heat problem is not as important as understanding what you are seeing. Any abnormal heating must be dealt with in some way. Infrared provides us with early detection of potential areas of failure before they turn into disasters.”



*The photo at the left shows what you see with the naked eye. A photo of the same structure, taken with a thermal imaging camera, reveals a hot spot that needs to be addressed.*

In one example, Hoops showed a photo of a knife switch overheating in the switching station on the Beaver Water District campus. Early detection meant that a repair was made before an actual problem occurred.

“Thermal sensing devices can be beneficially used to assess potential problem areas with respect to electrical equipment prior to failure and therefore can help in saving money and time to effect repairs,” Fortenberry said. “This is just one of the many tools we utilize to ensure that we operate in an efficient and safe manner.”

# Fortenberry Recognized as Leader in Water Industry



*Jim Beazley (left), Director of Forrest City Water Utility, presents the SWAWWA's 2010 Glen T. Kellogg Leadership Award to Alan D. Fortenberry P.E., CEO, of Beaver Water District.*

On Nov. 1, Beaver Water District's own Alan D. Fortenberry P.E., CEO, was recognized by his peers as a regional leader in the water industry. Jim Beazley, Director of the Forrest City Water Utility, did the honors when he presented Fortenberry, of Springdale, with the Southwest Section-American Water Works Association's 2010 Glen T. Kellogg Leadership Award.

Fortenberry joined Beaver Water District in 1991 as Plant Engineer. In 2001, he was named Chief Executive Officer. His major accomplishments include the expansion of the District's facilities to 140 million gallons a day, the completion of an award-winning new water intake on Beaver Lake, the completion of a new solids handling facility with centrifuges, the renovation of the Joe M. Steele Water Treatment Plant, and the construction of the new

Administration Center, which earned LEED Gold certification from the U.S. Green Building Council. (LEED stands for Leadership in Energy and Environmental Design.)

He is known for spearheading efforts with various partners to protect Beaver Lake water quality and the Beaver Lake watershed through increased research, monitoring and education activities. He also is involved with economic efforts in the area as a member of the Northwest Arkansas Council.

Fortenberry has a B.S. in Agricultural Engineering and M.S. in Environmental Engineering, both from the University of Arkansas at Fayetteville. He is a member of both the Academy of Biological/Agricultural Engineering and the Academy of Civil Engineering, and he was recognized as a Distinguished Alumni of the College of Engineering in 2007. He is a Registered Professional Engineer and holds a Grade IV Water Operators License. He served as Chair of the Southwest Section of the American Water Works Association for 2010, and he recently completed a term as Chair of the Arkansas State Board of Health.

The award is named for Glen T. Kellogg, who worked for the state department of health for almost 40 years and who is credited for being determined "to protect Arkansas' rivers, lakes, streams, and the public in general—many years before the advent of federal regulations and financing, and well before the words 'environmentalist' and 'ecologist' were stylish," according to the SWAWWA's website ([www.swaww.org](http://www.swaww.org)).

# Report Focuses on Beaver Lake Water Quality



*Richland Creek is one of three tributaries that flows to Beaver Lake. Photo courtesy of Harold Hull (digitaleyeimages.com)*

Beaver Lake, the water supply for more than 350,000 people in Northwest Arkansas, is affected by point and non-point sources of nutrients, sediment, and pathogens. In an effort to monitor these sources, Beaver Water District works with many partners to conduct ongoing research on the lake and its watershed.

A recent report quantified the amount of pollution and naturally occurring compounds entering the lake. Prepared by the U.S. Geological Survey (USGS) in cooperation with the District, "Constituent Concentrations, Loads, and Yields to Beaver Lake, Arkansas, Water Years 1999–2008" was published by the U.S. Department of the Interior and USGS.

"One reason we're interested in the quality of the water in Beaver Lake is because the quality directly relates to what the water will cost our customers," said Larry Lloyd, Chief Operating Officer for the District. "The cleaner and better the quality of the raw water, the easier and cheaper it is for us to treat the water for drinking."

Susan E. Bolyard, Jeanne L. De Lanois, and W. Reed Green conducted the research and authored the report, which focuses on the lake and its three main tributaries -- the White River, Richland Creek, and War Eagle Creek. These three tributaries represent approximately

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# Shipley Receives Wes Gordon Golden Deeds Award



Curtis Shipley received the Wes Gordon Golden Deeds Awards for 2010 during the Fayetteville Chamber of Commerce annual meeting, held Nov. 15. Shipley, who is retired, served on the Beaver Water District's Board of Directors for more than 28 years, from 1979 until the end of 2007. In his nearly three decades of service, the Board of Directors depended upon him for his wisdom regarding the need to expand the facilities in order to keep pace with the explosive growth of Northwest Arkansas during his tenure. In addition, the District benefited from his knowledge and wisdom concerning the increased need to educate the District's customers and the public about watershed issues that affect the quality of water in Beaver Lake.

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*Report Focuses* continued from page 5

69 percent of the total drainage area of Beaver Lake (measured upstream from the streamflow gaging stations).

The report's purpose is "to describe constituent concentrations, flow-weighted concentrations, loads, and yields to Beaver Lake for White River, Richland Creek, and War Eagle Creek for the study period, water years 1999-2008. ... The city of Fayetteville discharges about one-half of its treated sewage effluent into the White River immediately upstream from the backwater of the reservoir—however, the discharge is located downstream from the station where the sample was collected (USGS station 07048600). The city of West Fork dis-

charges its treated sewage effluent into the West Fork of the White River, and the city of Huntsville discharges treated sewage effluent into a tributary of War Eagle Creek. Nutrients, sediment, pathogenic bacteria, and other constituents unrelated to municipal wastewater also can enter Beaver Lake through its tributaries and around its shoreline. ... The principal agricultural activity in the area is poultry production and secondarily, cattle production. As a result of all these factors, there is substantial concern about the current and future water quality of Beaver Lake." To review the report in depth, please visit the District's website at [www.bwdh2o.org](http://www.bwdh2o.org).

# Residents Train One Another To Be LakeSmart

Living next to the water – it's the dream of a lifetime for many individuals. For those taking up residence alongside Beaver Lake, the dream includes responsibility for taking care of this precious resource. After all, the lake not only provides recreational opportunities, flood control, and hydroelectric power generation, the water in Beaver Lake also is critical to the lives of one in eight Arkansans. That's because it's the primary drinking water source for 350,000 plus people living in Northwest Arkansas.

With that in mind, representatives from several organizations got together in 2009 and began to discuss creating a program that would offer education and training to lakeside residents about how to live next door to the lake in harmony with nature. The result is LakeSmart, a program sponsored by Beaver Water District, the University of Arkansas Cooperative Extension Service, the U.S. Army Corps of Engineers, and the Association for Beaver Lake Environment.

Dr. Robert Morgan, Manager of Environmental Quality for Beaver Water District, said the LakeSmart program is modeled after a similar program in Maine. He heard about it at the 2008 National Lakes Conference in Chicago and brought the concept here.

"One of the strengths of a program like this is that it's based on training one neighbor who trains other neighbors and then, hopefully, there's a domino effect over a period of time," he said. "Most people want to do the right thing and be good stewards of the land and water. But oftentimes, they just don't know that something they might be doing could pose a potential harm to the lake. Once informed, most folks are happy to adopt

a new practice or technique. Sometimes, they even save money. For example, some people apply too much fertilizer to their lawn and the fertilizer runs off into the lake, and this is a pollutant. It's easy to get a free soil evaluation from the local county extension and find out what you need to apply. Usually, it's a lot less than folks think."

Here's how LakeSmart works. A lakeside resident is invited to host a LakeSmart program and invite neighbors. A date is set, and then a qualified trainer arrives to train residents. Trainers include urban stormwater agent Katie Teague and program associate Jane Maginot, both of the Washington County extension office, and urban stormwater agent Trish Ouei of the Benton County extension office.

Workshop attendees receive the Beaver Lake LakeSmart binder, an environmental self-assessment guide for lakeshore property owners. The binder is chockfull of information that includes a short questionnaire concerning topics such as site assessment, landscape management, water management and conservation, septic system management, maintaining household hazardous products, and boat and dock maintenance. The information presented by trainers is augmented by interactive videos of experts and additional reading materials.

"LakeSmart teaches lakeside residents how to properly maintain septic systems, do landscaping and use fertilizers safely, and about other habits that will protect the lake," said Ouei. "It's all about teaching residents how to reduce their environmental impact on the lake while improving their own quality of life," said Ouei.

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“We held our first training on August 14th, and so far, we’ve trained 12 volunteer leaders who are going into the community to raise LakeSmart awareness among their neighbors; they have trained another 60 lake residents on the program.”

The training sessions last four hours and there is no charge. Interested lakeside landowners can get involved with Lake Smart by calling Maginot at the Washington County Extension office in Fayetteville at 479-444-1755 or sending her an e-mail at [jmaginot@uaex.edu](mailto:jmaginot@uaex.edu).

## Take the Lead...



- Are you a lake side resident?
- Do you enjoy the beauty and quality of Beaver Lake?
- Do you want to protect your home and property?
  - Will you educate your neighbors in protecting our water?

**Love your lake by contacting the  
Beaver *LakeSmart* Program...**

University of Arkansas Division of Agriculture  
Jane Maginot  
Ph. #: 479-444-1755  
Email: [jmaginot@uaex.edu](mailto:jmaginot@uaex.edu)