

FACT SHEET: RESEARCH AT BIG CREEK

SUMMARY: Scientists from the University of Arkansas System Division of Agriculture are currently conducting an in-depth case-study of a Newton County hog farm in the Buffalo River watershed. The Big Creek Research and Extension Team, comprised of faculty and staff from the Division, is conducting the research using funds from Arkansas Gov. Mike Beebe. The funding was approved by a legislative subcommittee in September 2013 and site work on the study began in the following month. So far, researchers have been employing ground-penetrating radar, grid soil-sampling and water-monitoring devices as they lay groundwork for the multi-phase, long-term study. The first quarterly report was delivered Jan. 31, 2014, to the Arkansas Department of Environmental Quality and the Arkansas Governor's office. The report laid out team members and their plan of action for the study.

The study will provide scientifically rigorous information on any potential impacts of the farm on Big Creek, including levels of bacteria, and nutrients such as phosphorous and nitrogen. Major tasks in the study include:

- Monitoring the fate and transport of manure and bacteria from swine manure applied to pastures.
- Assessing the potential impact of farming operations including manure holding ponds and application of manure as fertilizer to farmlands on the quality of critical water features on and surrounding the farm including springs, ephemeral streams, creeks and ground water.
- Determining the effectiveness and sustainability of alternative manure management techniques, including solid separation, which might allow the manure to be moved efficiently outside of the Buffalo River watershed.

TIMELINE:

- Summer 2013** – Owners of C&H Farm approach experts from the University of Arkansas System Division of Agriculture to conduct a study to determine what affects, if any, their operation has on the Buffalo River. Later that year, the Governor of Arkansas also requested a study and assisted in making resources available.
- September 2013** – Funding for the research was approved by a subcommittee of the Arkansas General Assembly.
- October 2013** – Scientists from the University of Arkansas System Division of Agriculture begin their research.
- January 2014** – The research team's first quarterly report is delivered to the Arkansas Department of Environmental Quality (ADEQ) and Gov. Mike Beebe's office.
- March 2014** – A public hearing hosted by the research team is conducted to answer questions about the study.

- April 2014 –** A review team of four prominent, out-of-state scientists visits the farm, reviews the plan and makes recommendations to the Big Creek Research & Extension Team (BCRET).
- May 2014 –** The research team’s second quarterly report is delivered to the ADEQ and the Governor’s office.
- July 2014-** The research team’s third quarterly report is delivered to the ADEQ and the Governor’s office.

FREQUENTLY ASKED QUESTIONS:

Background, Scope and Funding

Q: How did the University of Arkansas System’s Division of Agriculture become involved in the Big Creek study?

A: In 2013, owners of C&H Farm approached their county extension agent for assistance, leading to a request to determine what affects, if any, their operation has on the Buffalo River. Later that year, the Governor requested a study and assisted in making resources available.

Q: Who is actually doing the work and are they qualified?

*A: **Dr. Andrew Sharpley**, a Distinguished Professor at the University of Arkansas System Division of Agriculture and an international authority on the impacts of agriculture operations on water quality and soil, is the leader of the Big Creek Research and Extension Team. Others on the team include:*

- **Kris Brye, Ph.D.**, Professor - Effects of land application of poultry litter on in-situ nutrient leaching, effects of land use and management practices on soil physical, chemical, and biological properties related to soil quality and sustainability.
- **Rick Cartwright, Ph.D.**, Professor – Associate Director of Extension for Agriculture and Natural Resources
- **Mark Cochran, Ph.D.**, – Vice President, University of Arkansas System Division of Agriculture.
- **Mike Daniels, Ph.D.**, Professor – Extension water quality and nutrient management specialist
- **Brian Haggard, Ph.D.**, Professor - Ecological engineering, environmental soil and water sciences, water quality chemistry, water quality monitoring and modeling, algal nutrient limitation, pollutant transport in aquatic systems
- **Phil Hays, Ph.D.**, Ground Water Specialist, U.S. Geological Survey and Research Professor with Geosciences Dept., University of Arkansas, application of stable isotopes and other geochemical indicators in delineating movement and behavior of contaminants in ground-water systems
- **Tim Kresse, M.Sc.**, Water Quality Specialist, U.S. Geological Survey, natural geochemical evolution of groundwater and separating these processes from anthropogenic sources of contamination

- **Nathan McKinney, Ph.D.**, – Assistant Director, Agriculture Experiment Station
- **Mary Savin, Ph.D.** - Structure and function of microbial communities in natural and managed ecosystems, microorganisms in nutrient cycling, contaminant degradation
- **Thad Scott, Ph.D.**, Associate Professor - Water quality, transport of contaminants to and within water bodies
- **Karl VanDevender, Ph.D. and P.E.**, Professor - Extension Engineer, Livestock and poultry manure and mortality management, nutrient management planning
- **Adam Willis, M.Sc.**, Newton County Extension Agent - Agriculture
- **Jun Zhu, Ph.D.**, Professor - Biological and agricultural engineering, agricultural sustainability, manure treatment technologies
- **Field Technicians** – The Big Creek Research and Extension Team are ably supported by several excellent Program Technicians based in Little Rock and Fayetteville.

Q: Why did you choose the research and extension team members that you did?

A: The team is made up of the region's foremost experts related to the impacts of agriculture operations on water quality and soil, ecosystems, karst geohydrology, manure treatment, and a number of other areas related to the issues in this situation.

Q: How long will it take to complete the study?

A: Initial funding is for one year. The study is designed to run for at least five years subject to available funds. It is our opinion that a definitive evaluation of any impact on water quality will take longer than one year.

Q: If the study finds any impairment, will the farm be shut down or fined?

A: The University of Arkansas System Division of Agriculture is not a regulatory agency. The Arkansas Department of Environmental Quality has the authority to levy fines and revoke permits.

Q: Have any private companies or organizations, including Cargill or the Arkansas Farm Bureau, directed the scope or influence of this study?

A: No. The Memorandum of Agreement between the ADEQ and the University of Arkansas System Division of Agriculture which commissioned the study states the study "shall meet the requirements of an independent study conducted by professionals in the field of water quality". The plan and methodology were devised independent of any outside influence. In April four independent, out-of-state water quality experts was invited to visit the study site, review the plan and report their recommendations to the BCRET. The review team's recommendations are under review by the BCRET.

Q: Is the publicity surrounding this project influencing the actions being taken. Are you being influenced by the publicity this project is receiving?

A: The public attention raises the visibility of the project, although we are approaching our study the same way we would any other. We know there is a great deal of passion and interest surrounding this issue. However, we had to eliminate passion and prejudice when developing the study. We will follow the protocols we have established believing them to be sound science.

Q: Is any state or federal government agency directing your research?

A: The BCRET is conducting its research outside the influence of any outside organization. Transparency is paramount, however, and our research has been – and will continue to be – shared with any interested parties through quarterly reports and other public meetings.

Q: Why should any tax dollars be devoted to help private landowners adopt best management practices or develop a more sustainable farming operation?

A: The Arkansas General Assembly and the Governor of Arkansas approved funding for this research after carefully considering its need. Additionally, the University of Arkansas System Division of Agriculture, as an institution of higher learning, often commits public resources in helping the broader agricultural industry because of the tremendous return on investment shared by all Arkansas citizens. We believe this study serves an overriding public purpose, and it is appropriate to assist land owners in protecting a public interest.

Q: Does the University of Arkansas System Division of Agriculture have a conflict of interest since it is so closely aligned with the agricultural community in the state, including the pork producers?

A: The work of our team is science-based and can withstand scrutiny. While we do have a close relationship with the agricultural community, we also have a history of providing research and educational programs aimed at protecting the environment. Our core values are to collect the best data and provide the best interpretation possible. In this study, we want to find answers that to ensure the Buffalo River Watershed and other watersheds are protected.

Q: Will all public expenditures be publicized quarterly?

A: Yes. Quarterly reports can be found [here](#).

Research

Q: Is field monitoring conducted only on fields where slurry (hog manure) will be applied?

A: Not solely. Baseline monitoring is also occurring on fields where no slurry is being applied to provide comparable data for researchers.

Q: Are you monitoring fields near the Mount Judea public school?

A: One of the monitoring fields included in the study happens to be the farm's application field closest to the school.

Q: Is there private land where you are not conducting research which is better suited for the purposes of this study?

A: While not every landowner approached granted us permission to enter their land for the purpose of placing long-term research equipment, the fields for which we were given permission are well suited for this study.

Q: Are you monitoring every field permitted to have hog manure applied?

A: While funding does not allow us to monitor every field, our team is monitoring land most necessary to conduct its research. And, simply, monitoring every field is not needed to cost-effectively conduct an accurate assessment.

Q: Is the BCRET monitoring activity on every site in the adjacent area of the hog farm?

A: Although we have received significant access to perform our research, there are privately-owned areas adjacent to the hog farm where we have not received permission to conduct our land studies. We are not a regulatory agency nor do we have the means to legally force our way onto property, protect monitoring equipment established on land on which we have not been invited or voluntarily permitted, or ensure the quality of our data. The access granted us is satisfactory to conduct a thorough study. We have been given permission to work on land by landowners who understand the value of this study.

Q: Is the ADEQ assisting you in accessing fields for which permission to establish monitoring has been denied?

A: No. We believe we can conduct the research necessary in the areas where access has been granted and do not feel there is a need to force participation by those who are choosing to deny us access.

Q: Is a dye test being conducted on both sewage lagoons?

A: This technique is technically not feasible, as the slurry could inactivate the dye. There are techniques being used by our scientists that are producing the results we need to properly conduct this study. Those methods have been discussed in our quarterly reports and will continue to be explained as we proceed.

Q: Is there a professional geologist or hydrologist on the study team?

A: Yes, Drs. Brian Haggard (University of Arkansas System Division of Agriculture), Phil Hays (AR-USGS), Tim Kreese (AR-USGS). Also, two US Geological Survey hydrologists have been participating and advising on the project; Dr. Phil Hays and Dr. Tim Kresse.

Q: Will your stream monitoring contain any data from fields on which you do not have monitoring equipment?

A: Yes. The nature of the research will allow us to determine the effect of landscape activities on water quality even if not all the fields are directly monitored.

Q: If you find adverse impacts to the watershed, isn't it too late by then?

A: No. Any adverse impacts discovered by our scientists could be evaluated and corrected. However, this study is specifically designed to detect any potential impacts before they take place and the work being done would significantly reduce the likelihood of any lingering affect.

Q: There is a lot of talk about water pollution – what about air pollution?

A: This scope of this study specifically relates to water and the potential effects on Big Creek. However, Dr. Karl VanDevender, the Biological and Agricultural Engineer on the project is currently working outside the scope of the project to help mitigate odor concerns.

Q: Because of the karst topography of the area, is there a real threat that sewage will seep into hidden holes, streams, and caves that cannot be detected?

A: As with most Arkansas swine farms, the manure will be used as a source of nutrients for local pasture and hay production. During application, buffer distances will prevent direct application

of manure to sink holes and water bodies. A focus of the study is to investigate potential risks associated with surface and subsurface movement of manure constituents in karst topography.

Q: What about animal welfare issues or the fact that this farm will contribute to anti-resistant bacteria, etc.?

A: The Division of Agriculture employs an expert in animal welfare research and will consult with her as specific issues arise.

Q: What about the other studies being conducted in the watershed?

A: Various studies are simultaneously being conducted by the US Geological Survey and private citizens. In all likelihood, state regulators and policy makers will welcome all science-based information and conclusions.

Big Creek

Q: Aren't the waters in Big Creek pristine? Will not even a slight rise in pollutants irreparably harm the environment?

A: Big Creek is a beautiful, near-pristine water resource and we are working to protect it. We believe watersheds like Big Creek are resilient, especially when immediate corrective action is taken if any problems are detected.

Q: Do you care more about one local farmer or a big corporation than about protecting the Buffalo National River?

A: The BCRET is focused on doing what is best for the Buffalo National River. We would never advocate for a local farmer or corporation who is adversely affecting a treasure like the Buffalo River. Similarly, we believe it is in the public interest to find science-based Best Practices that protect the river and avoids infringing on the rights of individuals.