

# Water Quality Update

Volume 6, Issue 4

July, 1997

## Feedlot Responsibility, Licensing Bill Passed

In early June Governor Frank Keating signed a bill, which requires Oklahoma feedlot operators to be financially responsible for any environmental problems they might cause.

The bill places a number of restrictions on Confined Animal Feeding Operations (CAFOs) and is considered a "watershed" by state officials, although it has faced criticism from pork producers and others.

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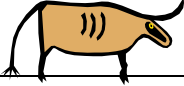
The law marks the first time Oklahoma has legislated setback distances separating residences and natural resources from new CAFOs, and the first time state law required CAFOs to be licensed.

A third stipulation of the bill requires CAFOs to be financially responsible for any environmental

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## DNA Fingerprints Aids Investigation - *Fecal Coliform* *Traced to Unlikely Suspects*



Tracking the source of fecal coliform contamination may not sound as exciting as reading a good mystery. But recent research into fecal coliform pollution in the southern Chesapeake Bay had more than enough suspense to qualify as a mystery, including several suspects and high tech investigative methods.

By systematically tracking clues in the field and using DNA fingerprinting in the lab, researchers at the Virginia Polytechnic Institute and State University appear to have cracked the case.

The case started when Roger Buyrn, a local landowner and clam grower, approached George M. Simmons Jr., Alumni Distinguished Professor at Virginia Tech with the case. Buyrn faced losing his clam business because of contaminated harvest areas in a tidal creek.

### *Rounding up the Usual Suspects*

Nonpoint fecal coliform may come from human waste, agricultural area, or wildlife. Although identifiable sources of coliform contamination are not always evident, fecal coliform sources are often linked to faulty on-site waste disposal systems. Few of the inlets in the study area however, were inhabited, intensifying the mystery.

The researchers tracked fecal coliform levels in the field by sampling at land/water interfaces and across marshes or up creeks. One the general source area was identified, the study group monitored them extensively.

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problems they might cause, although a state official said he doesn't consider this an insurance requirement.

The innovations come after increasing concern over water pollution and nuisance odors allegedly caused by hog farms. "There has been a ground swell of concern about these CAFOs," said Jason Nelson, the governor's environmental and agricultural liaison.

"The Department of Agriculture prepared, presented, and I signed a series of regulations which seeks to find that proper balance between our proud heritage as an agricultural state, our proud intention to remain a viable and prosperous agricultural state, and the need to protect the water and air for future Oklahomans," said Keating.

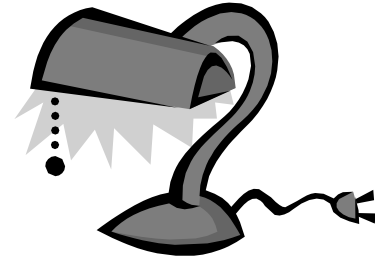
The industry has criticized the law in the press, but Nelson says Keating was trying to strike a balance between environmental and agricultural interests, and the governor agrees.

"Water quality is important to both rural and urban populations," Keating said. "To try and find that proper balance between a growing agricultural sector and healthy air and water quality...is a very delicate balancing act."

Some see the act as creating an unfair imbalance in the way the eastern half of the state is regulated as opposed to the western half. Nelson said, "One of the sticking points with the industry in that the setbacks are shorter in the east than in the west. That may be challenged."

Ken Biddle, former officer for the Department of Agriculture, says a major breakthrough is the requirement for pre-site approval. He said, "Before the facility could be under construction and the operator could then apply for a license. It was also a voluntary license before, and only larger operations would even apply." ♦

-Adapted from an article in *Texas & Southwest Environmental News* Vol. 7(3)



## Resource Spotlight

**Title: Protecting Groundwater Areas in Oklahoma through Nutrient Management**

**E-950**

**Authors: Department of Environmental Quality (DEQ), Oklahoma Cooperative Extension Service (OCES)**

**Length: 12 pages**

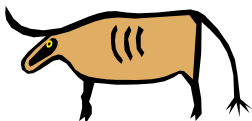
**Published: spring, 1997**

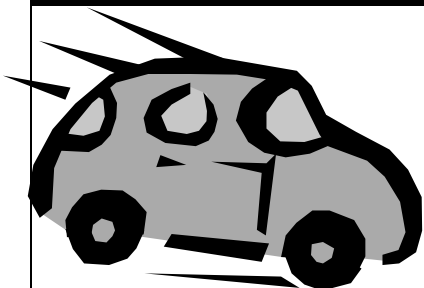
Educational materials are necessities when informing the public about complex environmental issues such as ground water contamination. This document was created as resource to help individuals understand the role of nutrient management in protecting ground water resources. It was originally conceived by DEQ to assist in their Wellhead Protection efforts.

Chapter titles include:

- Protecting Oklahoma's Groundwater from Nitrates
- Plant Nutrient Management in Oklahoma
- Abandoned Wells
- Septic Systems
- Animal Feeding Facilities
- Land Application of Manure

Copies of this publication are available from OSU Mailing Services (405) 744-5385, county Extension offices and from DEQ Customer Assistance Programs. We also have copies available for check out. Contact Darlene at 744-5653 if interested. ♦





## On the Move

Several OSU graduates are on the move and are making a name for themselves in the field of water quality.

Shannon Haraughty, has recently accepted the position of Technical Writer in the Water Quality Division of the Oklahoma Conservation Commission (OCC). Shannon replaces Kevin Wagner, another OSU grad, who is back in Stillwater at the NRCS state office. Kevin will be working on water quality projects in a unique joint OCC/NRCS position.

Also on the way to greener pastures or bluer waters (?) is Jennifer Myers, former Oklahoma County Blue Thumb Coordinator. Jennifer has accepted OCC's Wetlands Program Coordinator Position.

Congratulations and good luck!

If you need a copy of any articles, contact Darlene Rowley at (405) 744-5653.

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All along, Simmons and his colleagues believed that the sources would be anthropogenic in nature. "It took me about a year to come to grips with the fact that the fecal coliform were not coming from a leaky septic tank or other effluent," said Simmons. "It got to the point where I was climbing trees to see if I could see any potential sources (i.e., houses), but there weren't any."

### *Breaking the Case*

Simmons used DNA fingerprinting of *E. coli* to confirm his growing suspicion that the sources were not human. Simmons' group collected fresh fecal samples from raccoon, waterfowl, otter, muskrat, deer, and humans in the area and analyzed and characterized the DNA of coliform found in the samples.

The result was a library of more than 200 DNA patterns distributed through more than 700 *E. coli* strains. In the process, researchers developed a DNA dichotomous key and an index of descriptions for the know strains.

Identifying unknown sources was a challenging endeavor. Some *E. coli* strains are specific to certain animal species; others may contain several different strains. Comparing *E. coli* from the samples against the fingerprints of known strains in the DNA library, Simmons traces the sources to deer and raccoon.

### *Victims Reprieve*

During the winter of 1993, several hundred animals, including deer, raccoon, and muskrat, were removed from the Buyrn property and other nearby areas and by spring 1994, fecal coliform had decreased by one to two orders of magnitude. Threatened areas of tidal creeks were reopened or escaped closure

### *Epilogue*

In his next case, Simmons hopes to expand the DNA library to see if it is applicable to other parts of the Chesapeake Bay and beyond. As funding becomes available, he would also like to develop libraries for agricultural and urban areas, which would also include stormwater runoff. ♦

*Adapted from an article in Nonpoint Source New-Notes #48 April/May 1997.*

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