Applying knowledge to improve water quality

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# A Web-Based Spatial Poultry Litter Management System for Reducing Nutrient Loading to Surface Waterbodies

Puneet Srivastava, Moon Seong Kang, John Fulton, Ted Tyson, Frank Owsley, and Kyung H. Yoo



## Abstract Text:

Alabama consistently ranks in top three, with Arkansas and Georgia, in broiler production. On one hand the Appalachian Plateau region suffers from excessive amount of nutrients in the form of poultry litter, on the other hand the Black Belt region of Alabama suffers from depressed agricultural economy that stems from poor soil fertility in pasture, hayfields, and row crops. Thus, a Web-based Decision Support System (DSS) integrated with Geographical Information System is needed to: (1) identify clusters of land areas suitable for disposal of excess poultry litter, 3) perform computer assisted search for optimal (least cost and shortest route) transportation of litter from concentrated production areas in Appalachian Plateau region to Black Belt region, (3) help Certified Animal Waste Vendors (CAWVs) and farmers to efficiently develop P-Index and Nutrient management Plans (CNMPs) for Animal Feeding Operations (AFOs), and facilitating recordkeeping of all the poultry litter managed through a web-based DSS. Hence, a web-based comprehensive spatial poultry litter system is being developed to provide improved waste management strategies for sustainable on- and off-farm poultry litter utilization in Alabama. The system provides a user interface for poultry litter management through a web browser. The system is composed of four modules based on the Web browser: (1) Comprehensive Nutrient Management Planning (CNMP) Decision Module; (2) Transportation Analysis Module; (3) CNMP Assessment Module; and (4) Database management Module. This system is developed under the Microsoft ASP.NET 2.0 Framework integrated with ArcGIS Server. The developed web-based DSS will provide an optimal, state-wide management of poultry litter, which is crucial for sustaining the poultry industry and water resources in Alabama.


## Impact Statement:

There are several benefits and implications of this project. Some of which are listed below:

(1) Using this system, farmers and CAWVs will be able to dispose litter in the most economical and environmentally-friendly manner possible.

(2) CAWVs will be able to keep a detailed record of their activities and will be able to demonstrate to regulatory agencies that they are in compliance.

(3) There is general perception that the land base in major poultry producing counties in the Appalachian Plateau region has been exhausted, whereas many farmers in this region complain that they do not get litter they need for their farm. Using the PLDSS, users will be able to accurately determine the availability of the land base in this region.

(4) This system will supply an exhaustive database of land-applied poultry litter. Using this database, researchers will be able to study the hydrologic, geomorphic, and ecological characteristics that control NPS pollution in animal waste applied watershed.

(5) A company interested in developing value-added product from poultry litter will be able to identify hot spots of excess poultry litter.

(6) We will be able to accurately determine the potential of expansion of poultry industry in the Appalachian Plateau region.