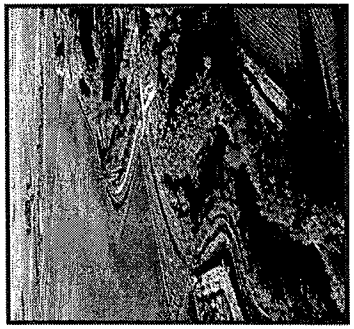

Arkansas NPS Management Program

2006-2010 Update

Arkansas Natural Resources Commission ● October 1, 2005.

EXHIBIT 21

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Arkansas NPS Pollution Management Program
2006-2010 Update

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Table of Acronyms

Arkansas NPS Pollution Management Program 2006-2010 Update

AACD	Arkansas Association of Conservation Districts
AACDE	Arkansas Association of Conservation District Employees
AAS	Arkansas Agricultural Statistics
ACP	Arkansas Conservation Partnership
ADEQ	Arkansas Department of Environmental Quality
ADH	Arkansas Department of Health
ADPCE	Arkansas Department of Pollution Control and Ecology
ADPT	Arkansas Department of Parks and Tourism
AEF	Arkansas Environmental Federation
AFC	Arkansas Forestry Commission
AFO	Animal Feeding Operation
AGFC	Arkansas Game and Fish Commission
AGC	Arkansas Geological Commission
AHTD	Arkansas Highway and Transportation Department
AIM	Alliance for Improved Middle Fork
ALD	anoxic limestone drains
ALPC	Arkansas Livestock and Poultry Commission
AMD	acid mine drainage
AML	Abandoned Mine Land
ANHC	Arkansas Natural Heritage Commission
ANRC	Arkansas Natural Resource Commission, formerly Arkansas Soil & Water Conservation Commission
ANRCS	Arkansas Natural Resource Conservation Service
AOGC	Arkansas Oil and Gas Commission
ASCMRC	Arkansas Surface Coal Mining and Reclamation Code
ASPB	Arkansas State Plant Board
ASWCC	Arkansas Soil and Water Conservation Commission
ATV	all terrain vehicle
AWAG	Arkansas Watershed Advisory Group
AWRC	Arkansas Water Resource Center

BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BMP	Best Management Practice
BWD	Beaver Water District
CAFO	Confined Animal Feeding Operations
CAST	Center for Advanced Spatial Technologies
CCC	Commodity Credit Corporation
CES	Division of Agriculture, Cooperative Extension Service
CNMP	Comprehensive Nutrient Management Plan
CRP	Conservation Reserve Program
CREP	Conservation Reserve Enhancement Program
CSP	Conservation Security Program
Cu	copper
DO	dissolved oxygen
ECP	Emergency Conservation Program
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ERW	Extraordinary Resource Waters
ESA	Endangered Species Act
ESW	Environmentally Sensitive Waters
EWP	Emergency Watershed Protection
FeS_2	iron pyrite
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FLEP	Forest Land Enhancement Program
FLP	Forest Legacy Program
FSA	USDA Farm Service Agency
FSP	Forest Stewardship Program
FWPCA	Federal Water Pollution Control Act
FY	Fiscal Year
GAAP	Generally Accepted Accounting Principles
GIS	Geographical Information Systems
GLCI	Grazing Lands Conservation Initiative
GRP	Grassland Reserve Program

GRTS	Grants Reporting and Tracking System
HAL	Health Advisory Level
HRU	Hydrologic Response Unit
IPM	integrated pest management
LDEQ	Louisiana Department of Environmental Quality
LPP	Low Pressure Pipes
LTAP	Local Technical Assistance Program
MAWPT	Arkansas Multi-Agency Wetland Planning Team
MCL	Maximum Contaminant Level
MIB	Methylisoborneo
MS4	Municipal Separate Storm Sewer System
MSWTP	Mid-South Watershed Training Program
MUSLE	Modified Universal Soil Loss Equation
NASS	National Agricultural Statistics Service
NELAC	National Environmental Laboratory Accreditation Conference
NEPA	National Environmental Policy Act
NH4	ammonium
NMP	Nutrient Management Plan
N	nitrogen
NO2	nitrite
NO3	nitrate
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NPS	Nonpoint Source Pollution
NRCS	Natural Resources Conservation Service
NRI	Natural Resource Inventory
NWA	Northwest Arkansas
NWI	National Wetlands Inventory
ORGP	Outdoor Recreation Grants Program
OSMRE	Office of Surface Mining Reclamation and Enforcement
P	Phosphorous
Pb	lead
P&D	Arkansas State Parks Planning and Development

P&DD	Planning and Development Districts
PMP	Pesticide Management Plan
RC&D	Resource Conservation and Development Council
R&D	United States Forest Service Research and Development
RMS	resource management system
RSF	recirculating sand filters
RUSLE	revised universal soil loss equation
SAP	successive alkalinity producing system
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SDWA	Safe Drinking Water Act
SMCLs	Secondary Maximum Contaminant Levels
SMZ	Streamside Management Zone
SO4	sulfates
STEPL	Spreadsheet Tool for Estimating Pollutant Loads
SWAP	Source Water Assessment Program
SWAT	Soil and Water Assessment Tool
TDS	total dissolved solids
TMDL	total maximum daily load
TNC	The Nature Conservancy
UAEX	University of Arkansas Cooperative Extension Service
UIC	Underground Injection Control
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	USDA Forest Service
USFWS	US Fish and Wildlife Service
USGS	United States Geological Survey
USLE	Universal Soil Loss Equation
UWRF	Upper White River Foundation
WCRC	Watershed Conservation Resource Center
WEPP	Water Erosion Prediction Project
WET	Water Education for Teachers
WHIP	Wildlife Habitat Incentives Program
WHPP	Wellhead Protection Program

WRAS	Watershed Restoration Action Strategy
WRD	Water Resources Division
WRP	Wetland Reserve Project
WWTP	Wastewater Treatment Plant
Zn	zinc

Section Ten

Illinois River Watershed

Priority Watershed

2006-2010 Nonpoint Source Pollution Management Update
A portion of ADEQ planning Segment 3J ♦ Hydrologic Unit Code 11110103

The Illinois River Watershed contains approximately 1.1 million acres of which approximately 493,500 acres (46%) are in Arkansas and approximately 576,000 acres (54%) are in Oklahoma. The Illinois River Watershed portion of segment 3J (HUC 11110103) occupies the northwestern corner of Arkansas and covers part of Benton County, a large part of Washington County and a small section of Crawford County. This segment includes the Illinois River and its tributaries within Arkansas. The main tributaries in Arkansas are Osage Creek, Flint Creek and Spring Creek.

Figure 10.1: Map of the Illinois River Watershed

http://baeg.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-cover.jpg

Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

Assessment

All waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation as well as public, industrial and agricultural water supplies (APCEC, 2001). The Illinois River Watershed portion of segment 3J contains 152 stream miles in which 125.1 stream miles were monitored at eight permanent monitoring stations. An additional 8.1 stream miles were evaluated for a total 133.2 stream miles monitored in the Illinois River watershed. Nonpoint source impacts affecting waters in this segment are primarily from pasture land that is also used for application of poultry litter as fertilizer. In addition, many activities contribute to the destabilization of the streambed and excessive bank erosion, including in-stream gravel removal, conversion of forest to pasture and removal of riparian buffers for construction and other activities. Road construction and maintenance is also contributing to siltation problems.

Table 10.1 summarizes studies that have found impaired reaches of the Illinois River and its tributaries. In addition, nutrient enrichment of the water bodies in this watershed is a concern, both from point and nonpoint sources. Known problems below wastewater treatment facilities do occur and are easily documented. However, detecting and determining the extent of impacts of the contributions of nutrients from nonpoint sources is difficult. Land use in the watershed is probably the best indicator of where nutrients have the greatest potential to impact water quality. Potentially, confined animal operations in high concentrations within a watershed can result in application of animal manures at nutrient rates greater than can be assimilated, resulting in the nutrients being transported into adjacent streams during storm events.

In addition, improper management techniques of the nutrients can also result in adjacent streams receiving nutrient inputs during storm events.

U.S. Geological Survey (USGS) and the Arkansas Natural Resources Commission (ANRC) cooperated on a project to collect and analyze water quality samples to estimate nutrient loads for nitrogen and phosphorus for 1997-1999 using regression analysis. Total estimated phosphorus and nitrogen annual loads for calendar year 1997-1999 using the regression techniques on 35 samples were similar to estimated loads derived from integration techniques on 1,033 samples. Nitrogen and phosphorus estimates were higher than for comparable undeveloped watersheds (Green and Haggard, 2001).

Arkansas Department of Environmental Quality (ADEQ) surveyed macroinvertebrate and fish communities in the Illinois River in 1995-1996 to assess the impact of municipal wastewater treatment facilities on water quality and aquatic life communities. In addition, the study characterized the effects of point source and nonpoint source pollution on seasonal water quality (ADEQ, 1997). USGS collected periphyton samples at 51 stream sites in the Ozark Plateaus to determine the effect of different land uses. Results indicate that periphyton communities are affected by natural and land-use related factors, including nutrients, dissolved organic carbon, alkalinity, canopy shading, suspended sediment, embeddedness, stream morphometry, and velocity (Peterson and Femmer, 2002).

The Natural Resources Conservation Service (NRCS) and U.S. Forest Service (USFS) completed a Cooperative River Watershed study for the Illinois River and published its Resource Base Report. The study found the Illinois River and many of the lakes on its tributaries were eutrophic from excessive nutrients (USFS and NRCS, 1992).

The Arkansas Water Resources Center (AWRC) prioritized sub-basins in the watershed in 1996 based on total phosphorus, total nitrogen and total suspended solids. Each sub-basin was given a low, medium or high prioritization for each of the three factors (AWRC, 1996).

A USFS comparative assessment of 50 watersheds in Arkansas and Oklahoma estimates potential erosion by land use for the Illinois River watershed. Based on 1992 National Resource Inventory (NRI) data, pasture land had the highest potential erosion rate at 72% compared to other lands (including urban) with a 15% potential erosion rate and forestry with a 2% potential erosion rate. Compared to 1982, potential erosion rates increased for pasturelands and decreased for other lands (USFS, 1999).

USGS has done extensive monitoring and analysis of surface and ground water quality in the Ozark Plateau study area as part of the National Water Quality Assessment Program (NAWQA). Major findings for the Ozark Plateau study area are available at: http://ar.water.usgs.gov/nawqa/ozark/findings.html.

Under contract with the Arkansas Natural Resources Commission (ANRC), the University of Arkansas Department of Biological and Agricultural Engineering, is using the soil and water assessment tool (SWAT) to model priority watersheds for the 2006-2010 NPS Management Program. Figure 10.2 uses SWAT estimates of sediment, run-off and

nutrient loads for phosphorus and nitrogen for some sub-watersheds in the Illinois River watershed to show the relative loading in quintiles for each sub-watershed, which roughly approximates the area of a 14-digit Hydrologic Unit Code area.

Figure 10.2: Relative estimates of contribution of Illinois River sub-watersheds to total estimated sediment, runoff and nutrient loads for phosphorus and nitrogen using SWAT

http://baeg.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-percentiles-flow.jpg
http://baeg.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-percentiles-sediment.jpg
http://baeg.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-percentiles-total-n.jpg
http://baeg.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-percentiles-total-p.jpg

Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

Table 10.1: Review of Impaired Reaches, Illinois River Watershed

Reach Name	Seg	Impairment	Impacts	Cause	Source	Comments
Clear Creek	029	Primary Contact (ADEQ, 2005)		Pathogens (ADEQ, 2005)	Urban Runoff (ADEQ, 2005)	
Clear Creek, Mud Creek	029	Aquatic Life (ADEQ, 2005 and 1997)		Siltation and Turbidity	Agriculture & Urban Runoff (ADEQ, 2002)	
Muddy Fork	025		Aquatic Life (ADEQ, 1997)			
Illinois River	022, 023		Aquatic Life (ADEQ, 1997)	Habitat Limitations (ADEQ, 1997)		
Osage Creek	930		Aquatic Life (ADEQ, 1997)			Influenced by cold spring water (ADEQ, 1997)
Spring Creek	931		Aquatic Life (ADEQ, 1997)			Influenced by cold spring water (ADEQ, 1997)

Brief Description of Land Uses That Can Impact Water Quality

Figure 10.3: Distribution of land uses in the Illinois River Watershed

http://baeg.uark.edu/wml/files/nps-maps/final-report/illinois/illinoisludraft_highres.jpg

Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

The following provide a partial snapshot of land uses in the watershed:

- There are seven drinking water sites in the Arkansas and Oklahoma portions of watershed. (USFS, 1999)
- The population of Washington and Benton counties grew 47% from 1990 to 2000, an increase of more than 100,000 individuals. Washington and Benton counties have continued to grow at a rapid pace from 2000-2003. Benton County added 12.1% and Washington County added 7.6% from 2000-2003 (University of Arkansas, 2005). As a result, there is significant new construction, including residential, commercial and industrial, roads and other infrastructure. Construction can be found both within municipal boundaries and in rural areas of the watershed where onsite waste disposal is used.
- An estimated 198,000 individuals live in the Arkansas portion of the watershed (U.S. Census, 2000).
- 12 municipalities and portions of Washington and Benton counties as well as the University of Arkansas are subject to Phase II requirements for a small municipal separate storm sewer system (MS4) National Pollution Discharge Elimination System (NPDES) permit. With leadership from the Northwest Arkansas Regional Planning Commission, all of these entities have joined together to contract with the University of Arkansas Cooperative Extension Service to provide education and technical assistance.
- Northwest Arkansas produced more broilers in 2002 than any other area of the state, although production in other areas is gaining (NASS, 2002).
- The entire watershed is designated as a nutrient surplus area subject to new regulations for nutrient planning, nutrient application and certification of nutrient planners.
- 53.8% of the land area in the watershed was pasture in 1999 while 39.3% was in forest and 6.4% was urban. Nearly one-quarter of the land area changed uses between 1992 and 1999 (BAEG, 1999).
- The USFS estimated there were 62,643 acres of riparian areas in its 1999 assessment of aquatic conditions (USFS, 1999). Of these, nearly half were in agricultural use, primarily pasture.
- The USFS estimated there were 272.0 miles of roads in riparian areas in the Illinois River watershed in 1999, including 113.4 miles of unpaved roads (USFS, 1999).
- The watershed provides habitat for four federally protected aquatic species.

- Most forest land in the watershed is owned by private non-industrial landowners and the national forest.
- Resource extraction (e.g., topsoil removal, gravel mining) primarily supports local construction projects.
- The State of Oklahoma lists the Illinois River watershed on its inventory of impaired water bodies.

Water Quality/Program Goals

The Illinois River Watershed has been a priority of the Arkansas NPS Management Program since the comprehensive update of the program completed in 1998. ANRC is again designating the Illinois River watershed as a priority watershed for the 2006-2010 NPS Management Program Update. Pollutants of concern within this hydrologic unit area include: turbidity, siltation, nutrients and pathogens. Some of these pollutants cause some water bodies to not fully meet their designated uses (ADEQ, 2005).

ADEQ published its proposed 2004 303(d) List of Impaired Water Bodies for comment on February 20, 2005. This list identifies one impaired segment of the Illinois River portion of ADEQ planning segment 3J. There are no streams in the Illinois River watershed with an approved total maximum daily load (TMDL). Table 10.3 lists the streams in the watershed where the water body may be impaired, or one or more designated uses may not be attained.

Table 10.2: Illinois River watershed streams that may be impaired or one or more designated uses may not be attained

Stream Name	Reach	Miles	Impairment	Sources	Causes	Category
Clear Creek	-029	13.5	Primary Contact	Urban Runoff	Pathogens	5d

The long-term goal of the priority watershed program is to reduce pollutants to levels that will restore all designated uses. The short term goal of the program is to measurably reduce turbidity, nutrients and pathogens that reach waters of the Illinois River watershed, targeting sub-watersheds where implementation can have the greatest impact. These goals will be achieved through implementation of a Nine Element Plan, which replaces a previous Watershed Restoration Action Strategy (WRAS). ANRC submitted a draft Nine Element Plan to Environmental Protection Agency (EPA) in March 2004 (ANRC, 2004). The plan is being revised and will be resubmitted for EPA approval. Public support will have to be further developed to implement the proposed activities.

Objectives and Milestones

Based on the SWAT and other available analyses, ANRC will review available data and select sub-watersheds for targeting of implementation funds. Data that may be considered in targeting includes but is not limited to the modeled loads for sediment and phosphorus, percentage of intact woody riparian vegetation, density of unpaved roads,

number of stream road crossings, rural population density, density of animal feeding operations, degree of urbanization, potential sources of pollutants and population served by water supply intakes in the watershed. Other factors may also be considered at the discretion of ANRC, including but not limited to, local institutional capacity, input from the NPS Management Task Force, local watershed groups or other agencies, availability of funds and other factors.

The 2006-2010 NPS Management Program Update includes statewide programs aimed at reducing pollutant loads from land uses that have the potential to impact water quality. These land uses and programs to reduce their water quality impacts are described in more detail in earlier sections of the 2006-2010 NPS Management Program Update. Statewide programs that will be implemented in the Illinois River watershed and their relative level of priority are included in the table below.

Table 10.3: Relative priority of statewide programs to effect improvements in water quality in the Illinois River Watershed

Description of Land Use	**Statewide Program**	**Intensity of Land Use/Potential Impact**
Animal Agriculture	Agriculture	
▪ Confined animals		Very High
▪ Pasture (e.g., application of poultry litter to pasture, unconfined livestock)		Very high
Row Crop Agriculture	Agriculture	Not applicable
Forestry	Silviculture	
▪ Public lands		Low to moderate
▪ Industrial		Not applicable
▪ Private Non-Industrial		Low to Moderate
Urban	Household & Small Business	
▪ Rapidly urbanizing area subject to Phase II small separate municipal storm sewer system (MS4) NPDES permit requirements for stormwater management		Very High
Construction	Surface Erosion	
▪ Road & other infrastructure		Moderate to High
▪ Residential development		Very High
▪ Commercial/industrial		Very High
Onsite waste disposal	Household & Small Business	Very High
Stream bank modification	Surface Erosion	High
Surface mining (e.g., top soil removal, gravel mining)	Resource Extraction	Moderate to High

The following objectives and milestones were identified with input from the NPS Management Program Task Force. Cooperating entities are described in Section 3 of this plan. Table 3.3 identifies cooperating entities that will partner to implement the watershed program in the Illinois River.

10.1. Continue development of the Nine Element Plan until EPA approval is obtained.
Timeline for Milestones: October 2005 – September 2010

10.2. Continue to develop support for implementation of the Nine Element Plan among potential cooperating entities and the general public.
Timeline for Milestones: October 2005 – September 2010

10.3. Provide technical and financial assistance to local cooperating entities to implement the Nine Element Plan as resources allow.
Timeline for Milestones: October 2005 – September 2010

10.4. Promote and support strengthening of local capacity to implement the Nine Element Plan, encouraging local review of a range of options to identify the most effective institutional mechanism to lead implementation.
Timeline for Milestones: October 2005 – September 2010

10.5. Use remote sensing and Geographical Information Systems (GIS) analysis to identify sub-watersheds where more extensive assessment is needed. Conduct targeted geomorphological and bio-assessment to identify and target implementation of streambank stabilization projects for high impact sites. Promote use of riparian tax credits and cost-sharing programs to fund restoration projects and develop conservation easements.
Timeline for Milestones: October 2005 – September 2020

10.6. Continue to develop models to represent sediment and nutrient loads in the watershed, in-stream processes and lake response to enable prioritization of implementation projects in sub-watersheds.
Timeline for Milestones: October 2005 – September 2010

10.7. Continue to encourage the development of comprehensive nutrient management plans (CNMPs) or nutrient management plans (NMPs), provide technical assistance and make available financial assistance to animal agricultural operations where cost-share is a component of approved implementation projects.
Timeline for Milestones: October 2005 – September 2010

10.8. Continue and strengthen ongoing comprehensive education and training programs to help poultry and livestock producers meet the requirements of new ANRC poultry litter and nutrient application regulations and new ADEQ confined animal feeding operations (CAFO) regulations.
Timeline for Milestones: October 2005 – September 2010

10.9. Continue to develop and provide coordinated, comprehensive education for city planners, elected officials, developers, contractors, property owners and others using workshops, print and electronic materials, demonstration projects and other methods on topics such as: storm water pollution prevention plans, proper installation and maintenance of erosion and sediment control, planning tools to improve storm water management (e.g., low impact development, greenways, cluster development) and other related topics.
Timeline for Milestones: October 2005 – September 2020

10.10. Cooperate with and support the efforts of local nonprofit organizations, municipalities, and other cooperating entities to develop and deliver a coordinated environmental education program with a local emphasis.
Timeline for Milestones: October 2005 – September 2020

10.11. Identify groups for targeted education on specific high impact activities (e.g., develop and post fact sheets for boaters on proper waste disposal and the potential impact at boat ramps and marinas; provide training to county elected officials, road departments and property owners associations on how to reduce erosion from rural roads; or provide education to homebuilders, developers and homeowners on methods and activities to reduce NPS pollution) as resources allow.
Timeline for Milestones: October 2005 – September 2010

10.12. Identify severe erosion sites at rural road crossings and work with county government to develop and implement erosion control plans for high impact sites (e.g., promote use of conservation district hydromulcher for treatment).
Timeline for Milestones: October 2005 – September 2010

10.13. Encourage development of urban forestry projects in municipalities within the watershed.
Timeline for Milestones: October 2005 – September 2010

10.14. Carry out comprehensive information and education program quality for community leaders, including mayors, county judges, Quorum Courts, planning boards and commissions, Conservation District directors, and others. Emphasize the need to protect water and the benefits of clean water for the economy, quality of life and the environment.
Timeline for Milestones: October 2005 – September 2010

10.15. Continue to provide training to earth moving contractors and their employees, public works department employees, county employees and others regarding operation and maintenance of construction BMPs through the partnership with the Northwest Arkansas Regional Planning Commission and Cooperative Extension Service in order to help them meet the requirements of EPA phase II stormwater regulations for construction and municipal separate storm sewer systems.
Timeline for Milestones: October 2005 – September 2010

10.16. Review tax code to determine possible mechanisms to use tax incentives for water quality BMP implementation in nutrient surplus areas, especially for practices that minimize the direct impact of cattle on streams.
Timeline for Milestones: October 2005 – September 2010

10.17. Work with elementary and secondary teachers to develop teaching modules regarding water quality protection and conservation that meet curriculum requirements of the Arkansas Department of Education.
Timeline for Milestones: October 2005 – September 2010

10.18. Investigate the use of the Clean Water Revolving Loan Fund for alternative on-site wastewater systems.
Timeline for Milestones: October 2005 – September 2010

10.19. Build constituency for improved water quality by increasing volunteerism for cleanups and streambank restoration and other activities utilizing the Arkansas Game and Fish Commission Stream Team program and other conservation groups, conducting water awareness days, building working relationships with groups that represent recreational users (e.g., bird watchers, paddlers, hunters, etc), and other means.
Timeline for Milestones: October 2005 – September 2010

Timeline for Milestones

Provided sufficient human and financial resources are available to the cooperating entities working together in the Illinois River watershed, the short term objectives of this program can be met within five years of implementation of this update. Fully implementing management measures within the watershed to restore all designated uses is a longer term endeavor. A goal of this program is to fully meet designated uses within 15 years.

Program Coordination

There is currently no single entity in the Illinois River watershed with the authority to implement the Nine Element Plan. ANRC will work with cooperating entities in the watershed to promote voluntary coordination and incorporate conditions requiring cooperation in grant agreements, as appropriate. A high degree of voluntary coordination already exists in the agriculture program, through the Arkansas Conservation Partnership (ACP). In the construction and urban programs, there is significant coordination through a voluntary contractual agreement among municipalities, counties, the University of Arkansas, the Cooperative Extension Service and the Northwest Arkansas Regional Planning Commission to provide education and training on storm water management.

Federal Consistency

The lead agency for each statewide program is responsible for working with federal partners to promote federal consistency. Statewide programs and their lead agencies are identified in the Cooperating Entities Section of the 2006-2010 NPS Management Program Update. Watershed specific consistency issues may be addressed in other venues, such as the Arkansas-Oklahoma Compact Commission.

Program Tracking and Evaluation

Water quality monitoring data will be used to evaluate the effectiveness of nonpoint source pollution management activities in the Illinois River watershed. The ADEQ is responsible for maintaining the state's water quality inventory. They maintain eight monthly monitoring stations within the Illinois River Watershed. In addition, the USGS and ANRC maintain monitoring sites in the watershed. Real-time flow data are available at the USGS stations as well as some water quality data. ANRC monitoring stations focus on sediment, nitrogen and phosphorus-related parameters which are most significant in assessing nonpoint source pollution. Figure 10.4 shows all of the monitoring stations in the watershed.

Figure 10.4: Monitoring Stations in the Illinois River Watershed

http://baeg.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-monitoring.jpg

Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

BMP implementation data will be tracked for ANRC projects. New biosecurity provisions included in the 2002 farm bill may make it difficult to obtain data files NRCS cost-share projects to monitor implementation of agriculture best management practices (BMPs). Implementation data for NRCS cost-share projects are available from the national NRCS website; however, data must be downloaded separately for each BMP, making the effort labor intensive and prone to human errors. Potentially, Conservation Districts could report aggregate BMP implementation by sub-watershed, thus maintaining confidentiality of landowners while still providing information needed for evaluation. Arkansas Forestry Commission (AFC) monitors silviculture BMP implementation biennially. ADEQ will monitor inspection and complaint data for related regulatory programs it administers (e.g., surface mining, NPDES permits, etc).

The NPS Management Program may include pre- and post-project measurements of changes in water quality as a condition of funding. The NPS Management Program encourages cooperating entities working in the watershed to meet annually to report on their activities of the previous year and frankly discuss their successes, failures and future needs of their programs. Local cooperators are encouraged to compile this information, along with a summary of available water data and land use trends, into an annual watershed status report published and distributed in the watershed and to interested parties outside the watershed.

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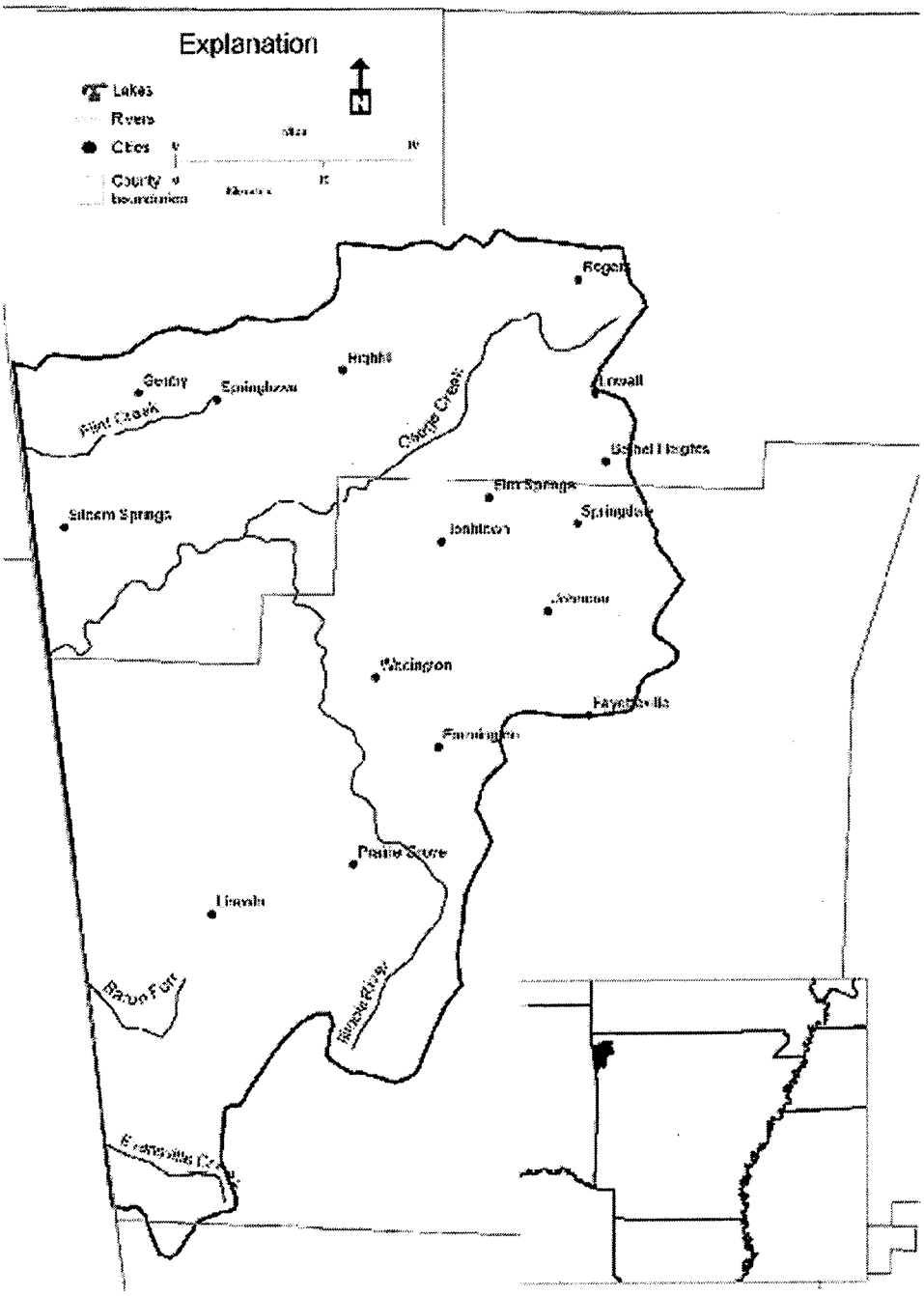
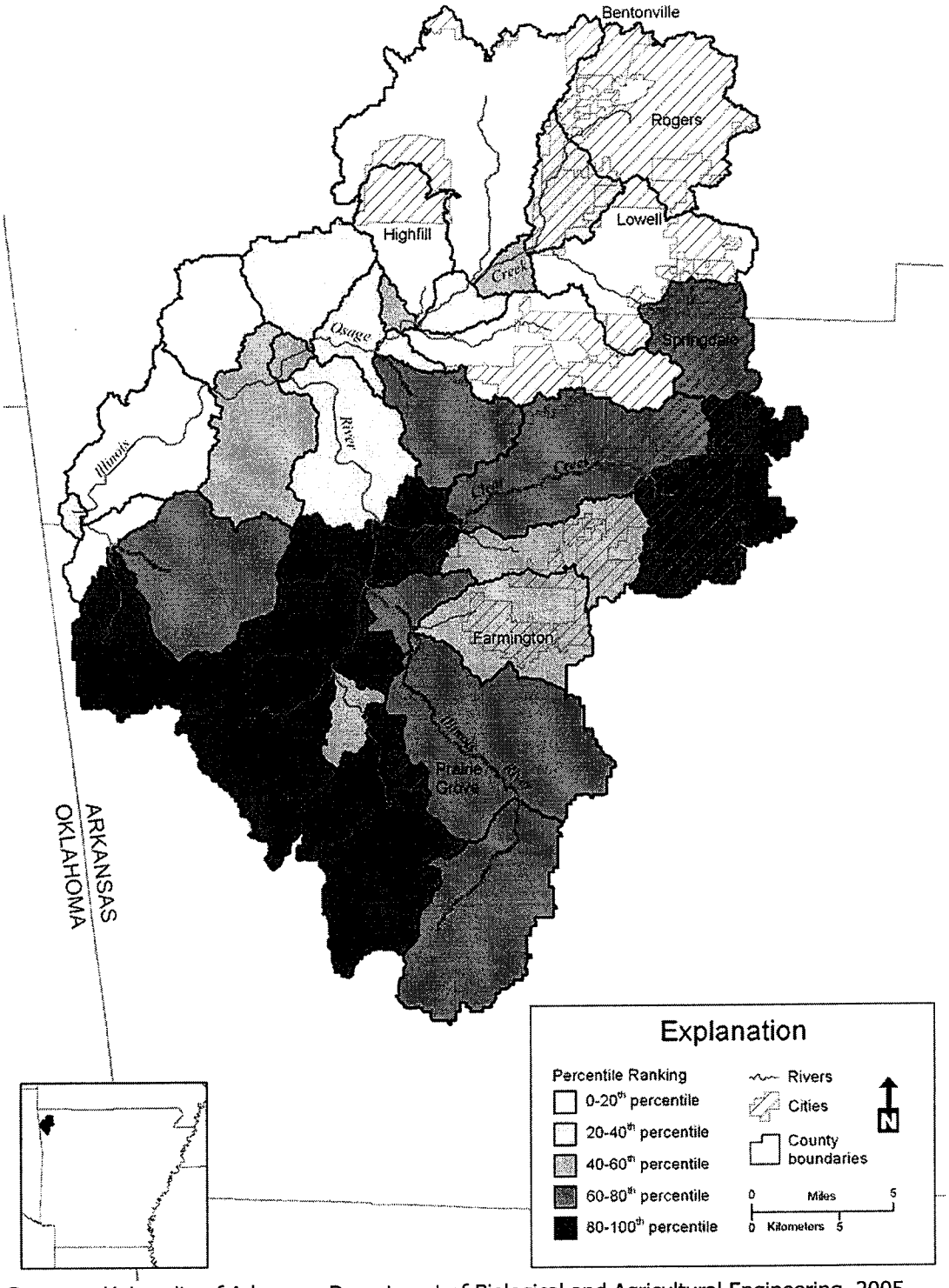
Figure 10.1: Map of the Illinois River Watershed



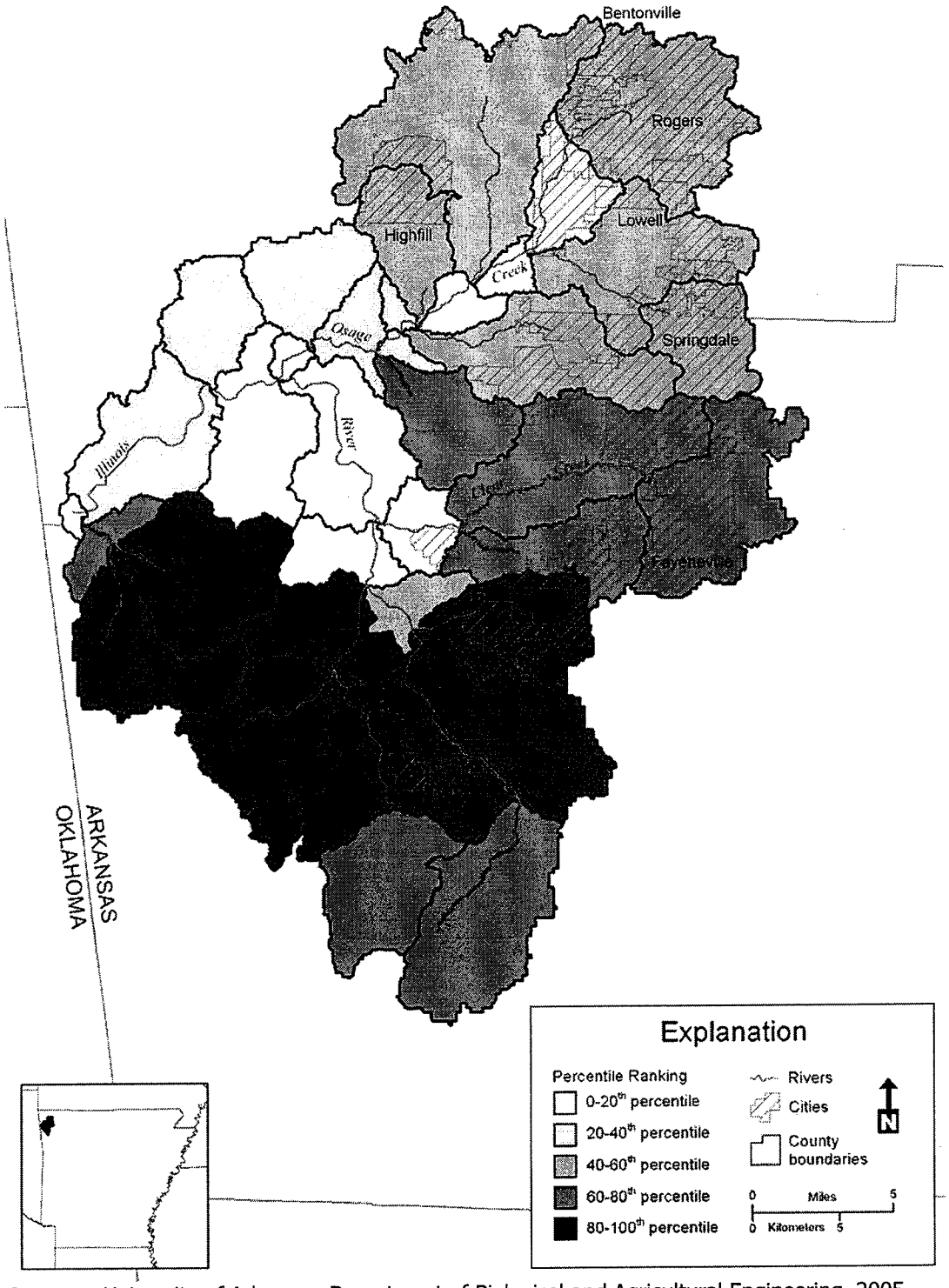
Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

Figure 10.2a: Relative estimates of contribution of Illinois River sub-watersheds to total estimated runoff using SWAT



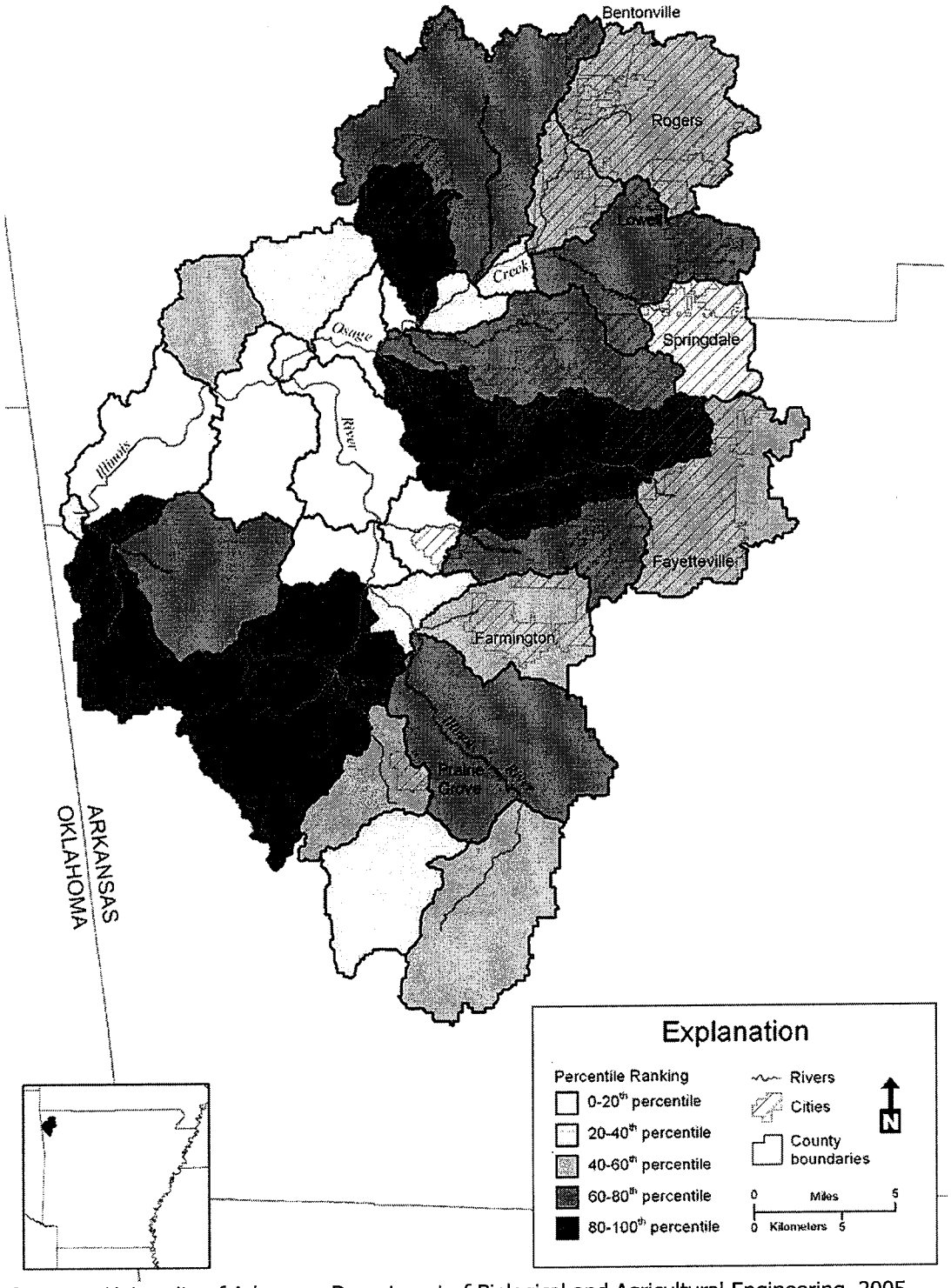
Source: University of Arkansas, Department of Biological and Agricultural Engineering, 2005

Figure 10.2b: Relative estimates of contribution of Illinois River sub-watersheds to total estimated sediment using SWAT



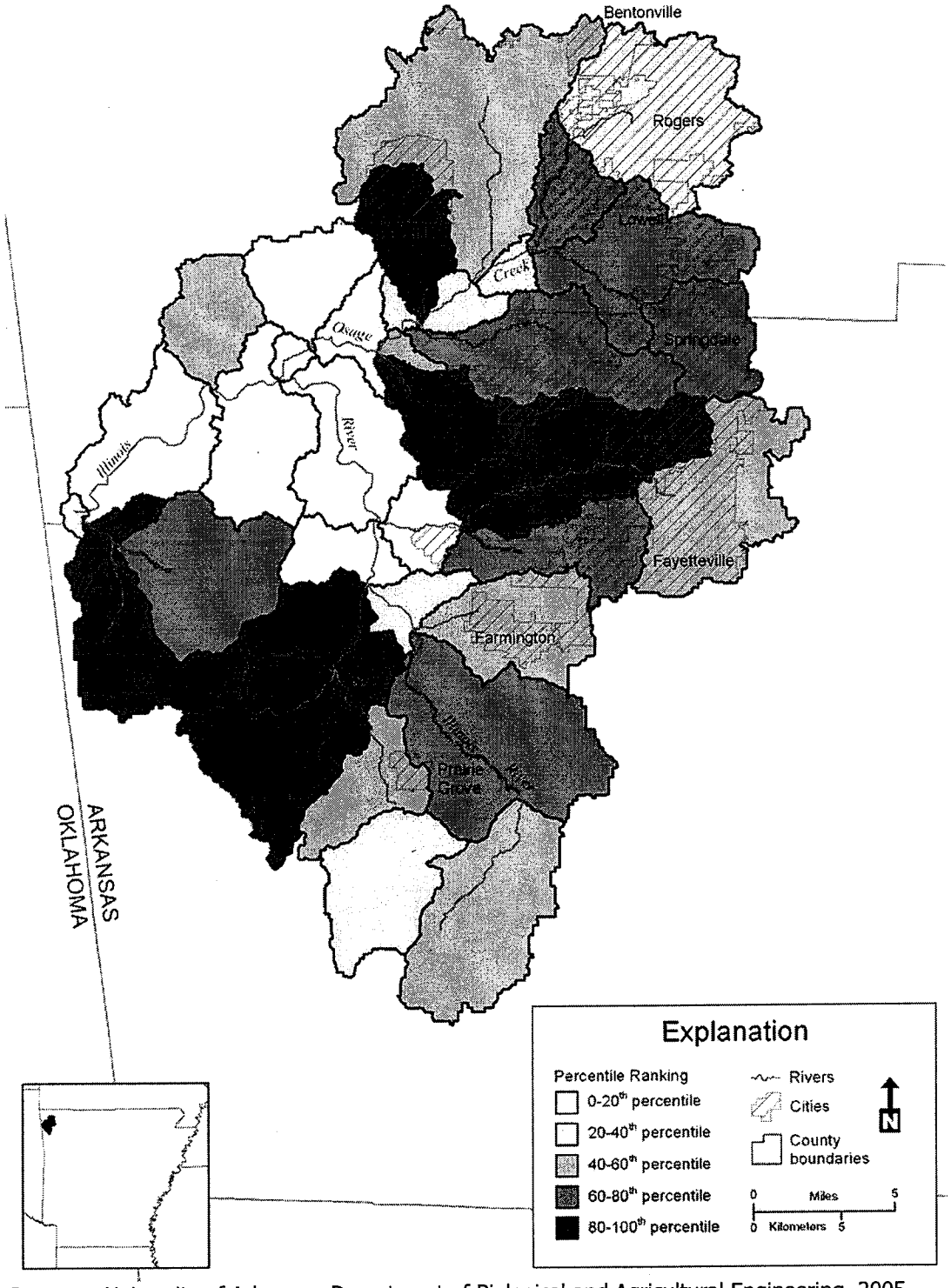
Source: University of Arkansas, Department of Biological and Agricultural Engineering, 2005

Figure 10.2c: Relative estimates of contribution of Illinois River sub-watersheds to total estimated nitrogen using SWAT



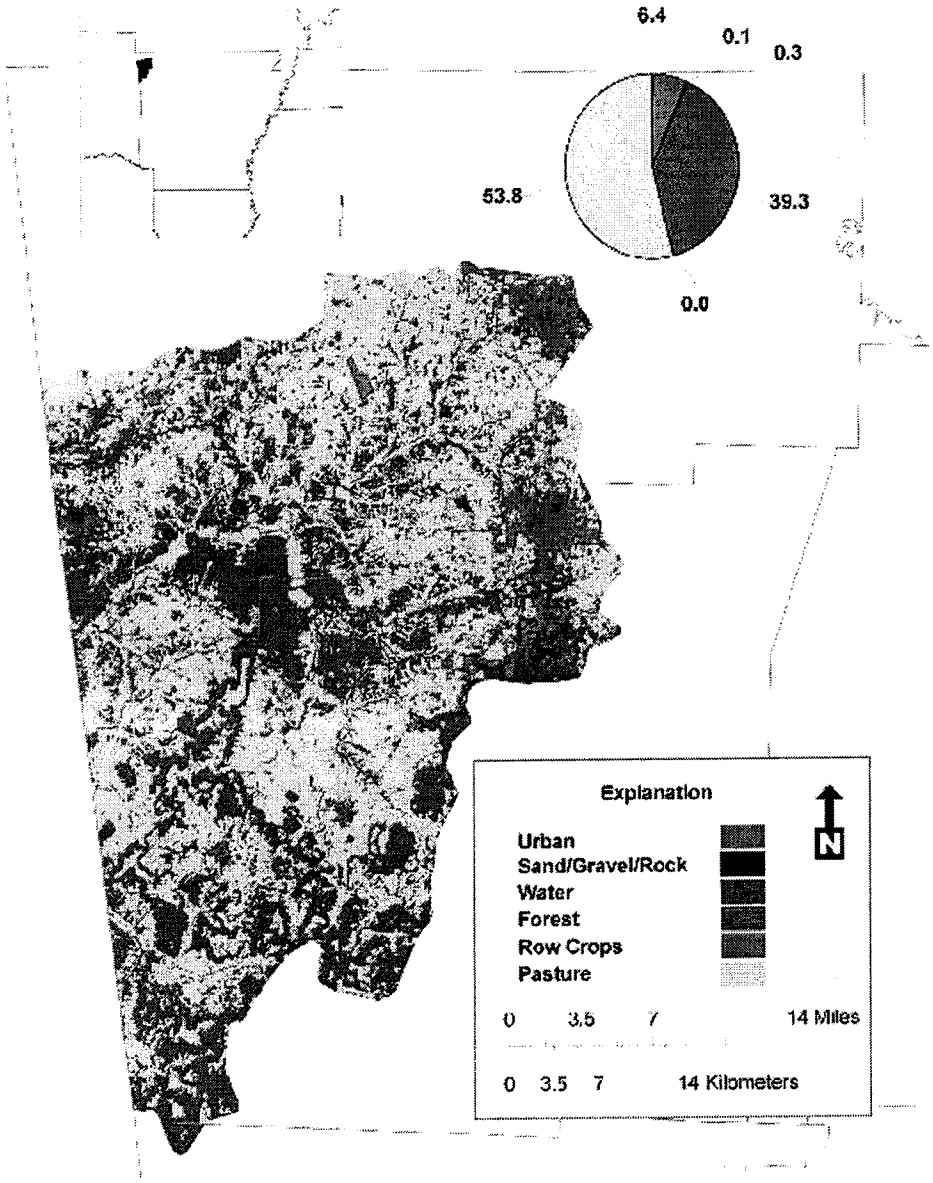
Source: University of Arkansas, Department of Biological and Agricultural Engineering, 2005

Figure 10.2d: Relative estimates of contribution of Illinois River sub-watersheds to total estimated phosphorus using SWAT



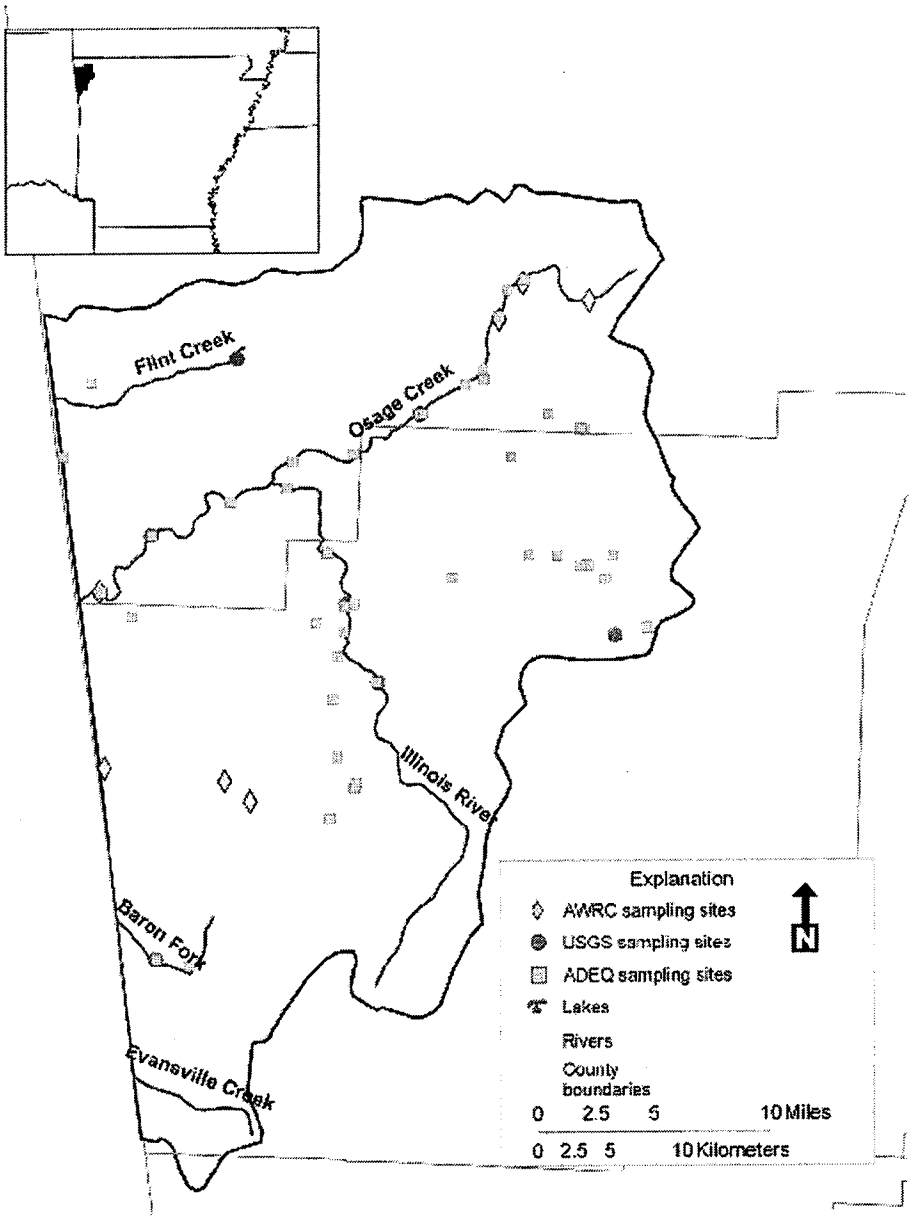
Source: University of Arkansas, Department of Biological and Agricultural Engineering, 2005

Figure 10.3: Distribution of land uses in the Illinois River Watershed



Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

Figure 10.4: Monitoring Stations in the Illinois River Watershed



Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005