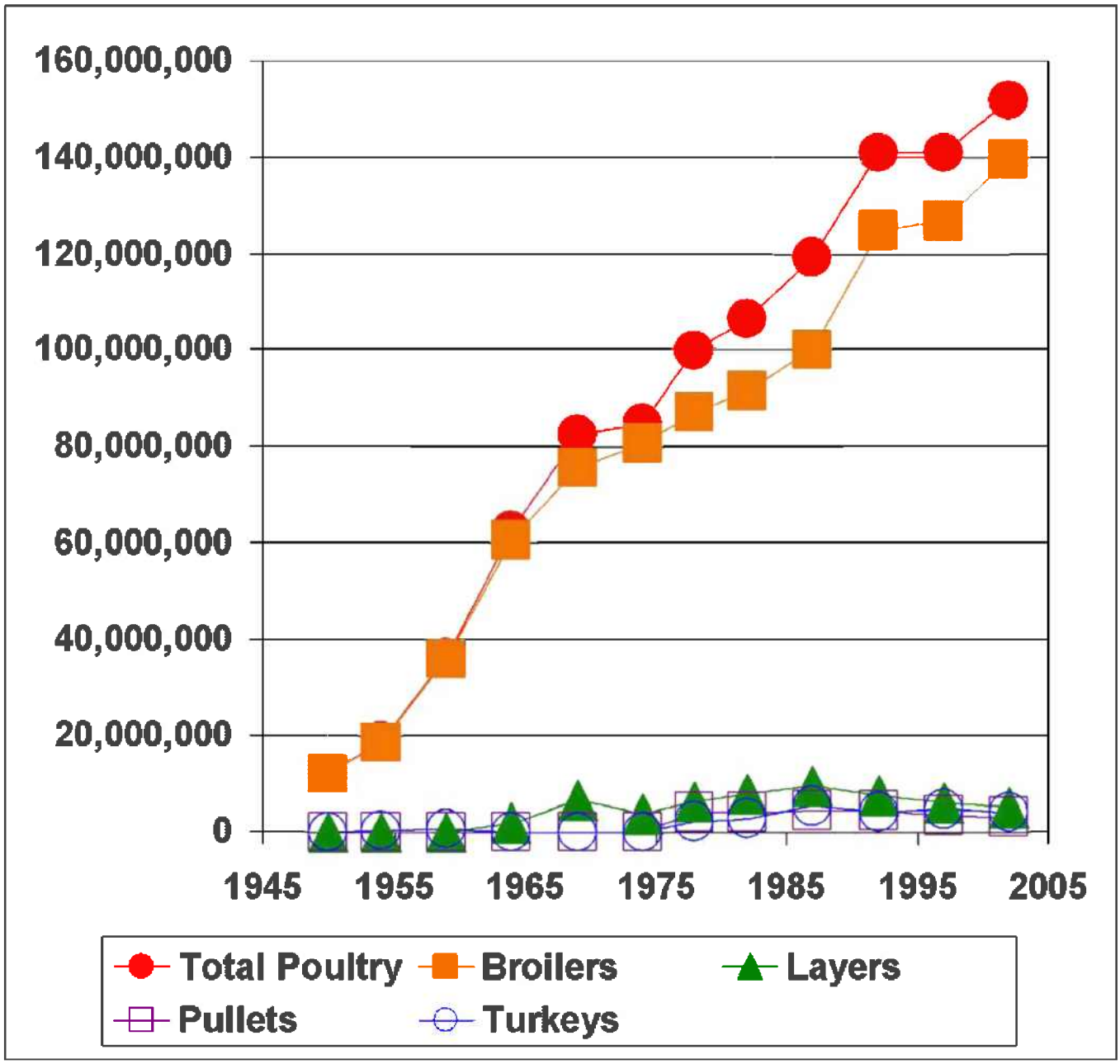


Figure 1. Poultry production within the Illinois River Watershed 1949/1950 – 2002 determined from USDA agricultural census data and land use/land cover data.

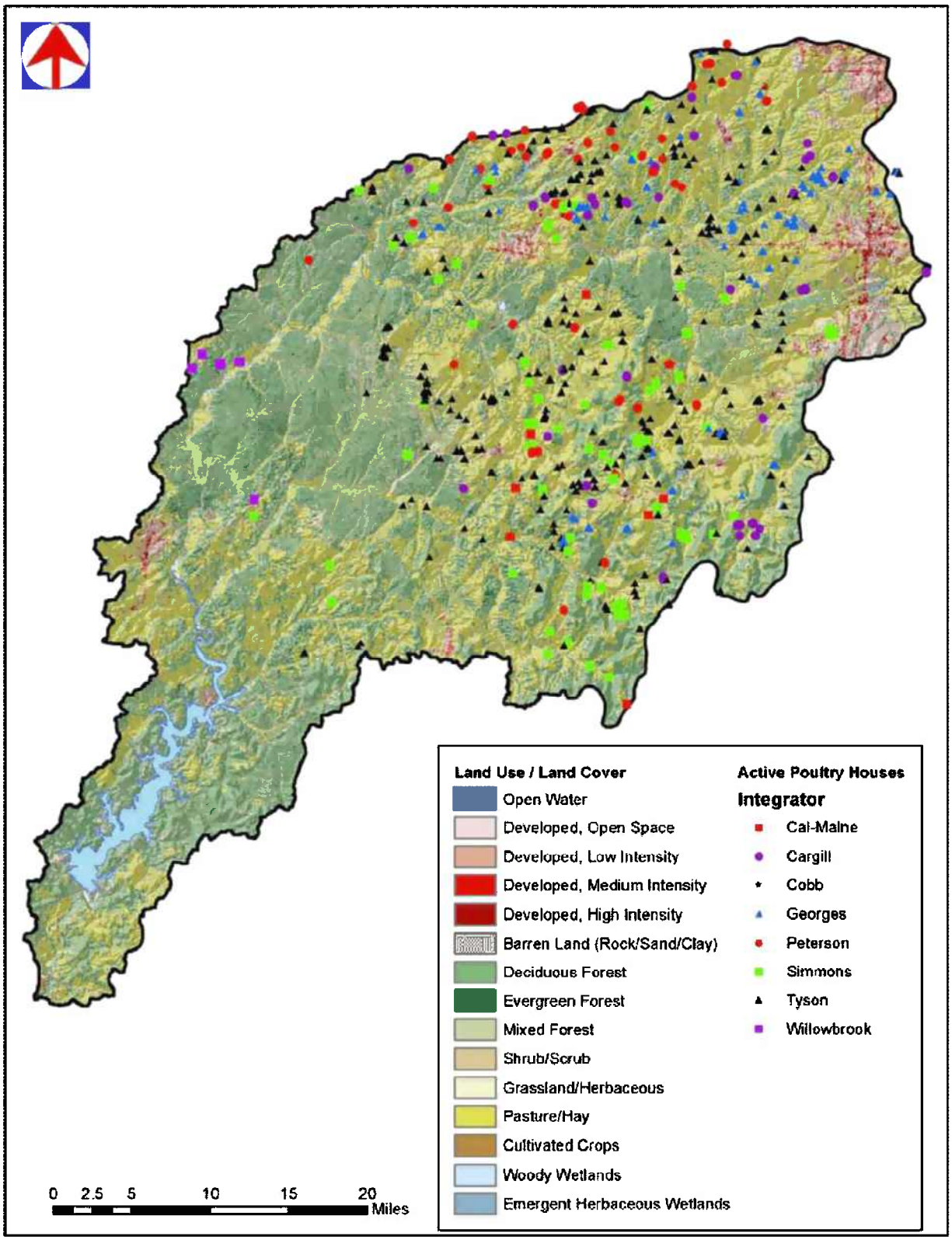
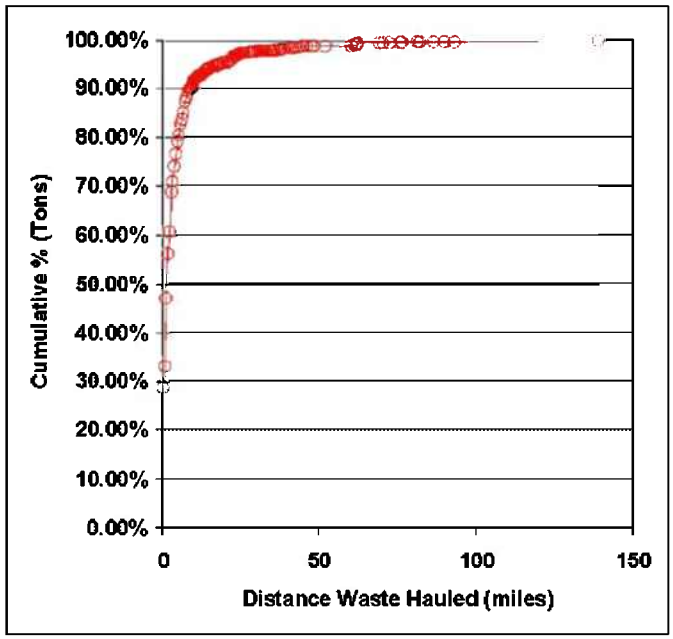


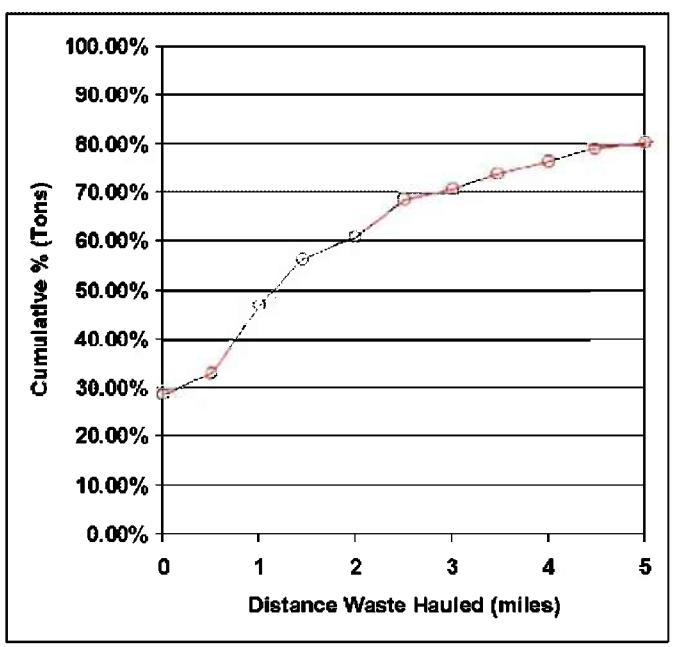
Figure 2. Locations of active poultry houses with identified integrators in the Illinois River Watershed.

OK-PL-0008526

Figure 3. Disposal of poultry waste from Peterson Circle Farms by land application taken from N36.25636 W94.51073 on May 5, 2005
(Investigator Notebook OK-PL-0004948)

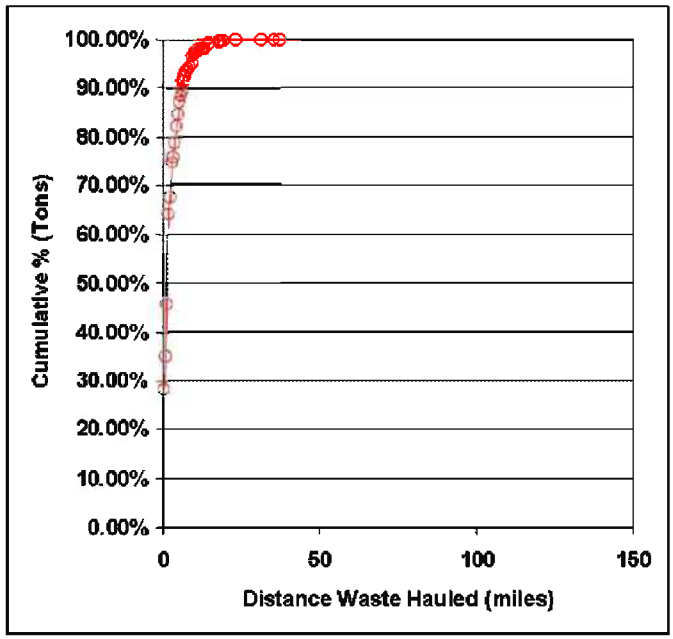


All Data for Land Disposal Of Poultry Waste In Oklahoma

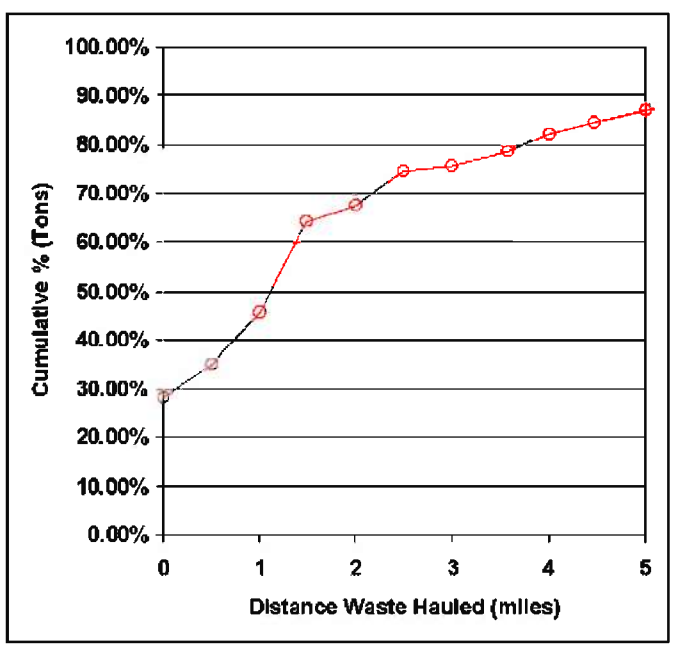


80% of waste disposed within < 5 miles

Figure 4. Cumulative frequency plot of the distances between the location of poultry waste production and the location of poultry waste disposal in Oklahoma based on records maintained by the Oklahoma Department of Agriculture Food and Forestry



Data for Land Disposal Of Poultry Waste Originating Entirely Within the Oklahoma Portion of the Illinois River Watershed



80% of waste disposed within < 4 miles

Figure 5. Cumulative frequency plot of the distances between the location of poultry waste production and the location of poultry waste disposal for wastes originating within the Illinois River Watershed in Oklahoma based on records maintained by the Oklahoma Department of Agriculture Food and Forestry

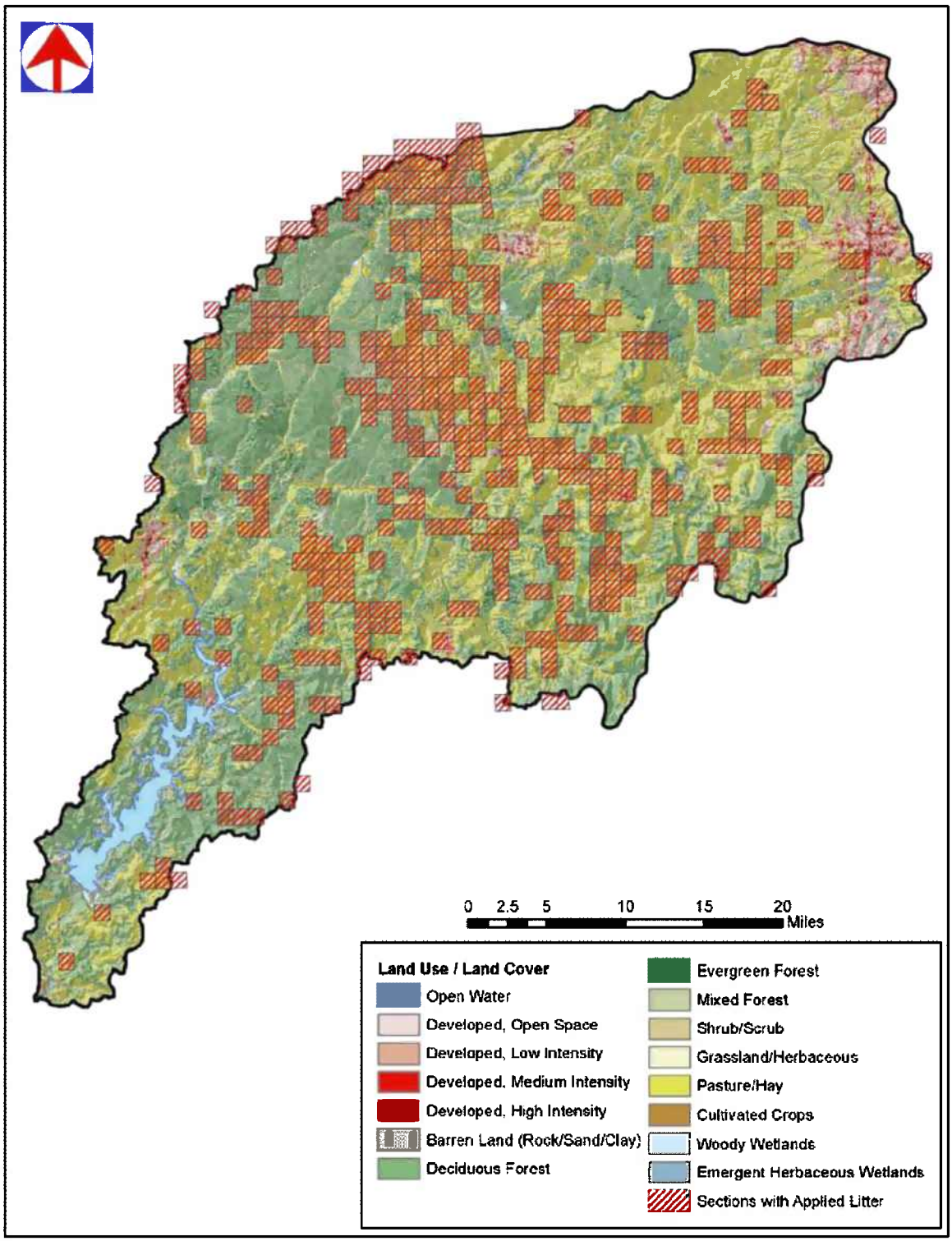


Figure 6. Public land survey sections in which poultry waste has been disposed within the Illinois River Watershed based on records maintained by the Oklahoma Department of Agriculture, Food and Forestry, investigator reports and Defendants' documents.

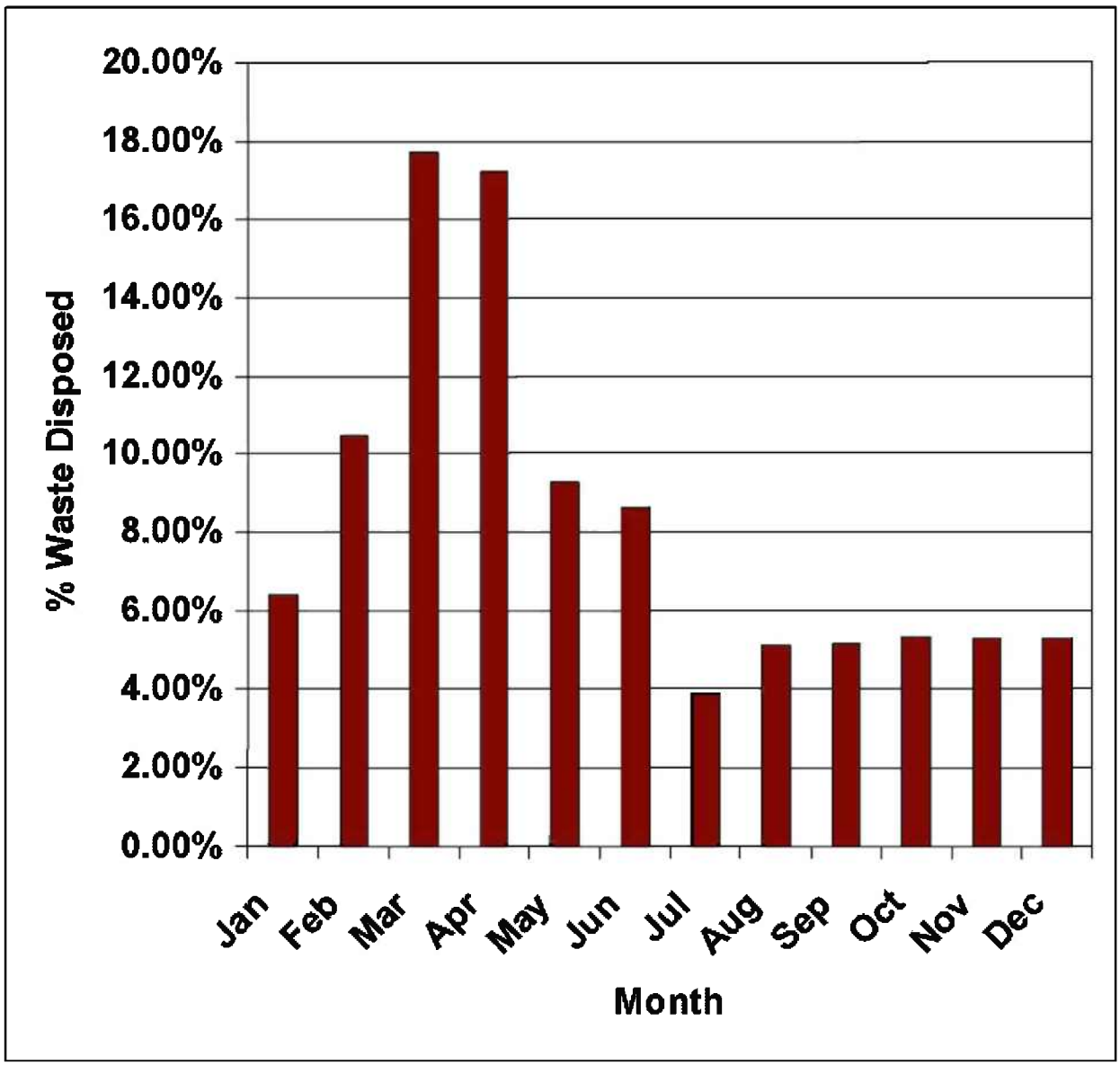
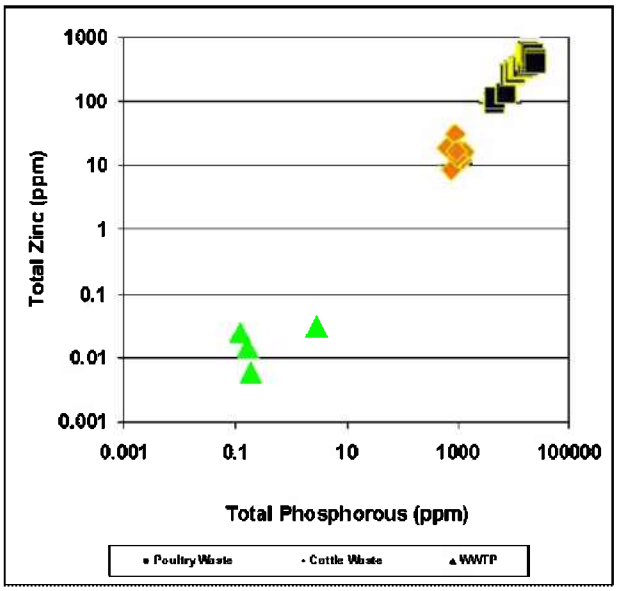
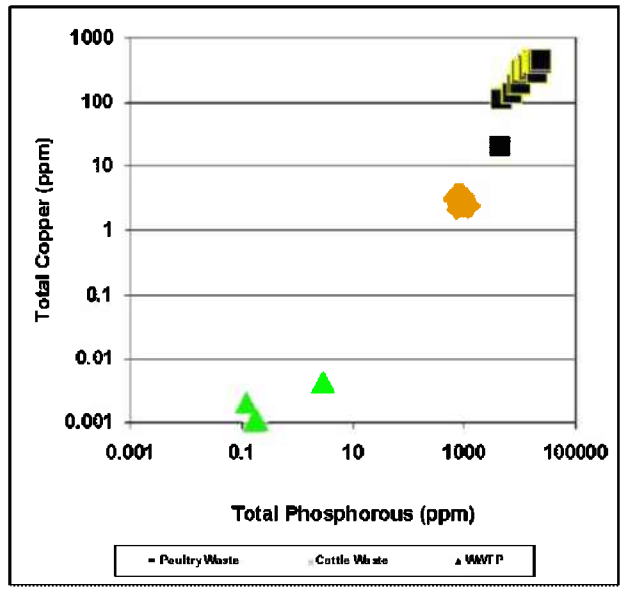
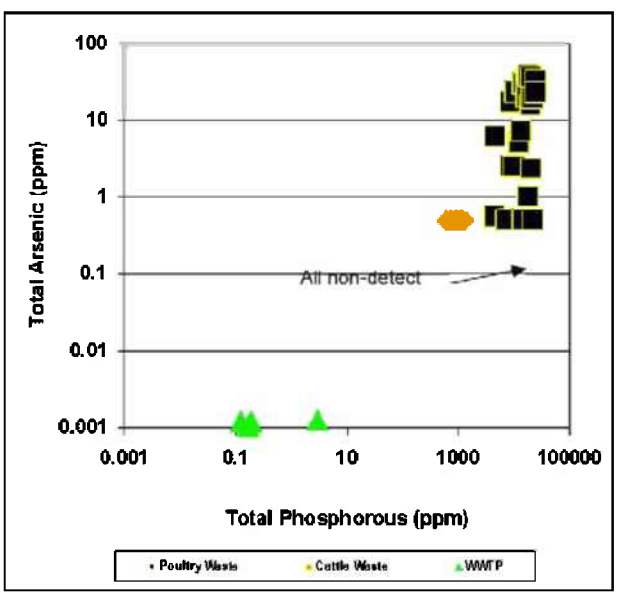


Figure 7. Timing of poultry waste disposal within the Oklahoma portion of the Illinois River Watershed determined from records maintained by the Oklahoma Department of Agriculture Food and Forestry (1999-2004 data).







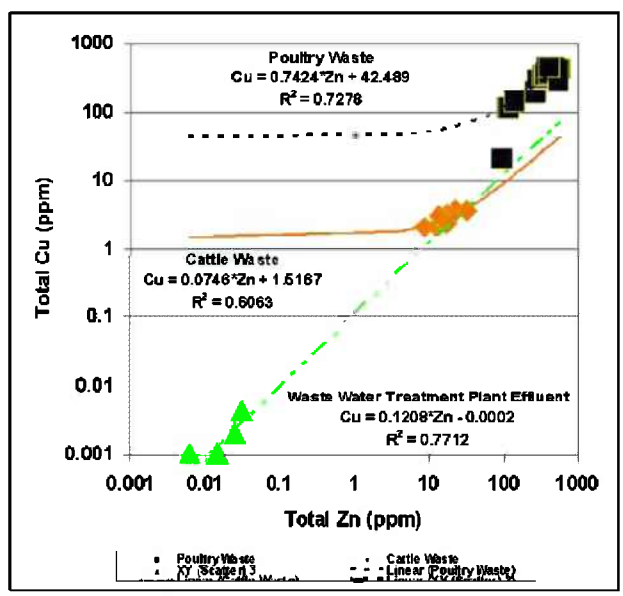


Figure 8. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in poultry waste, cattle waste and unfiltered wastewater treatment plant effluent.

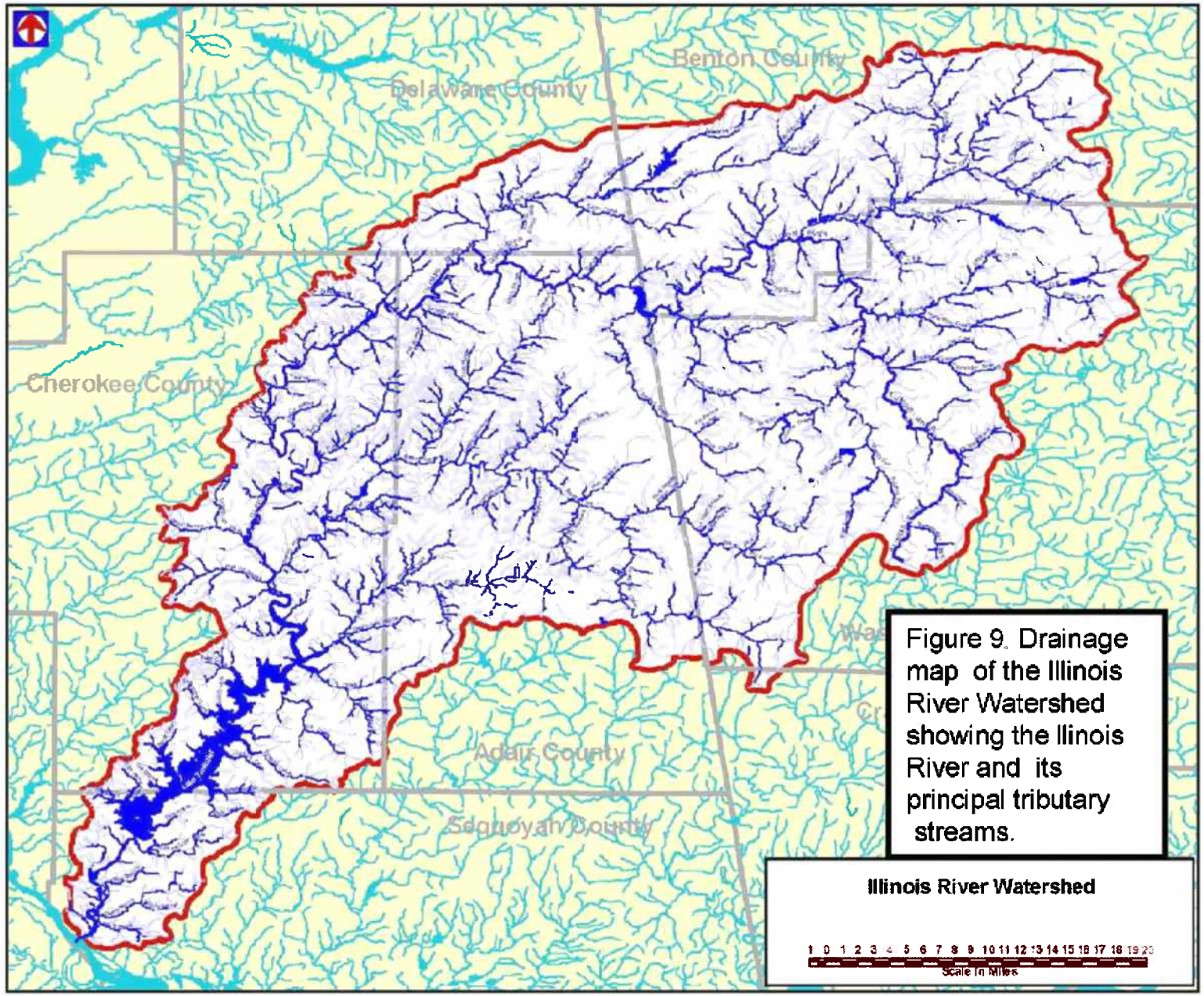


Figure 9. Drainage map of the Illinois River Watershed showing the Ilinois River and its principal tributary streams.

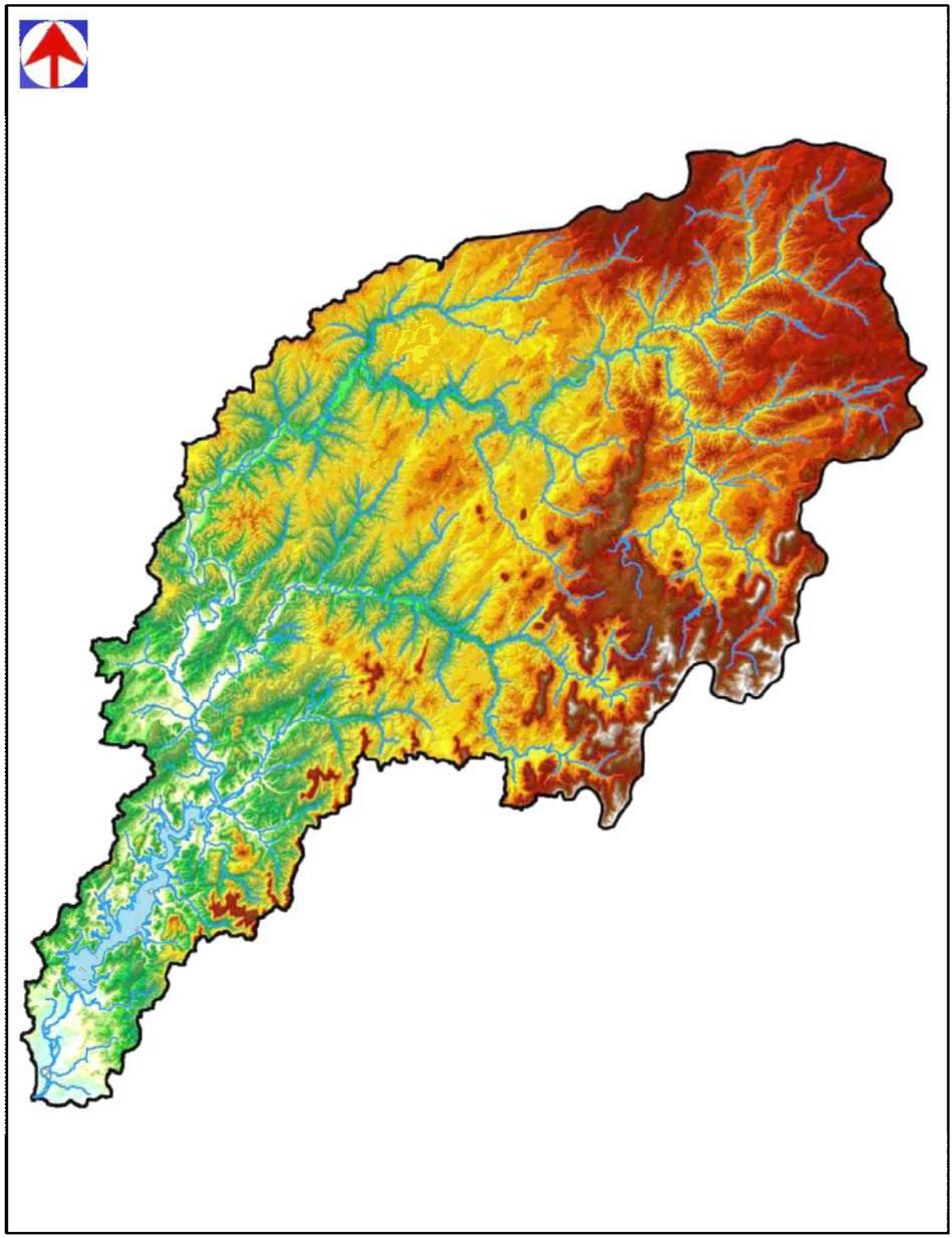


Figure 10. Digital elevation map of the Illinois River Watershed.

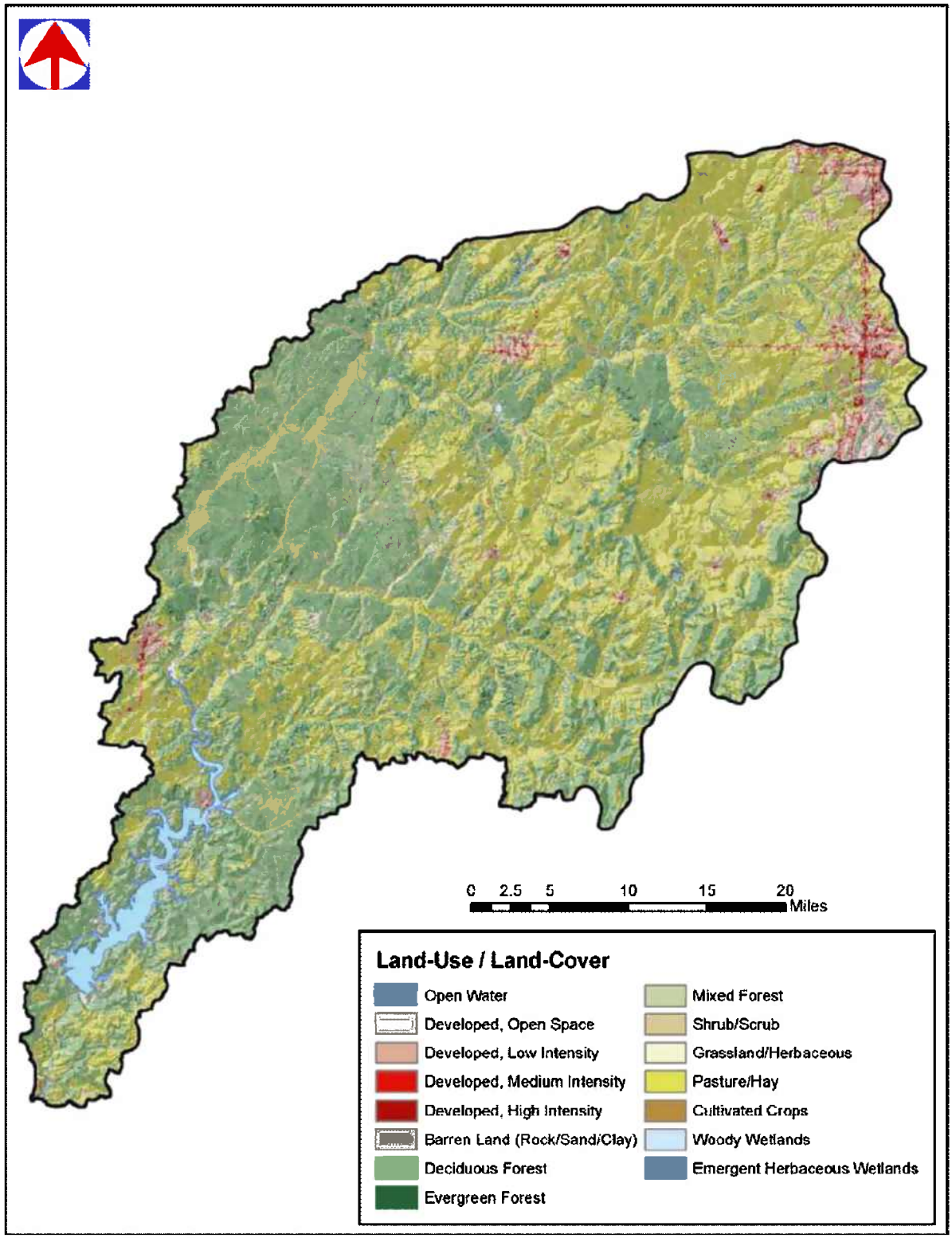


Figure 11. Land Use / Land Cover in the Illinois River Watershed

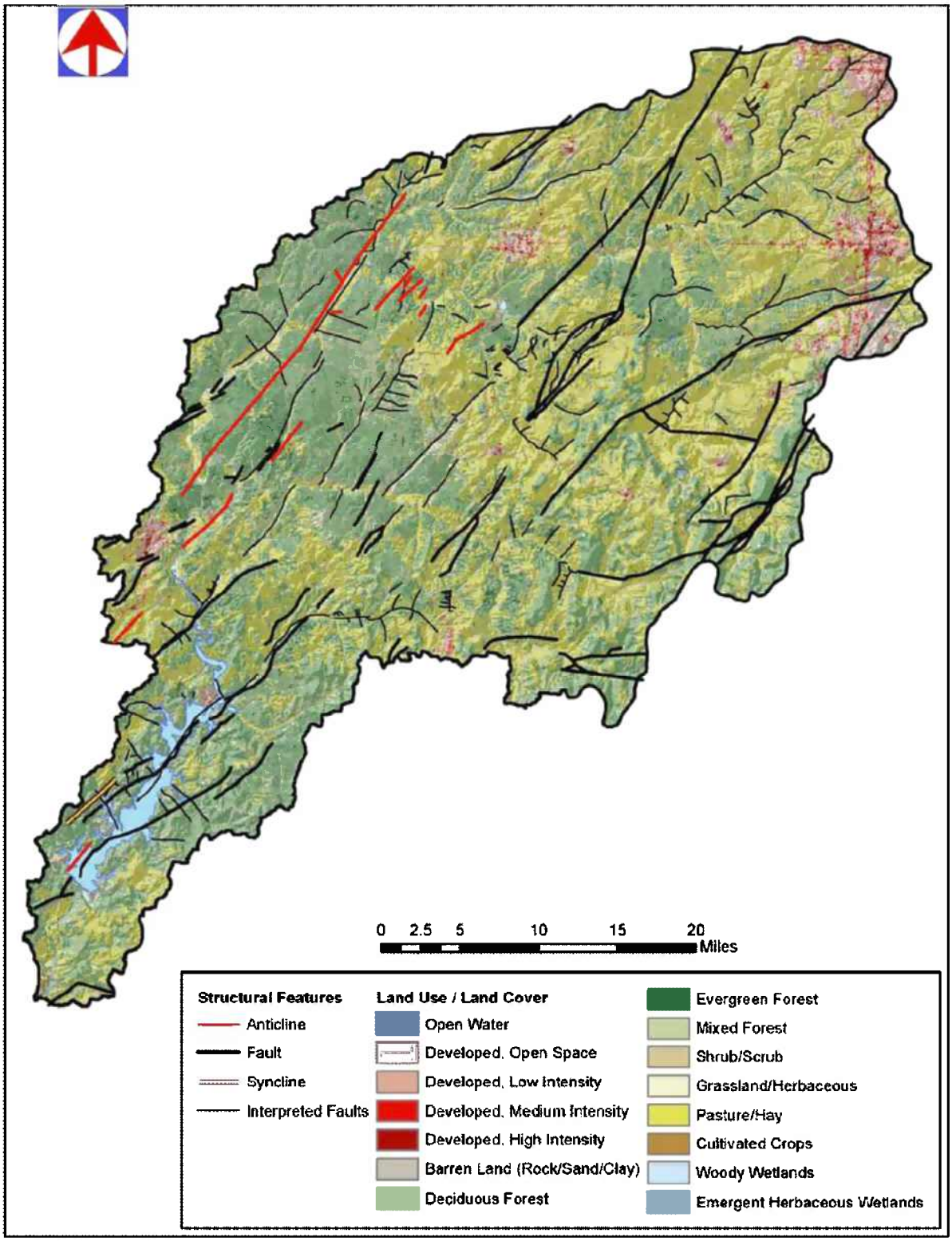


Figure 12. Major faults and structural features in the Illinois River Watershed

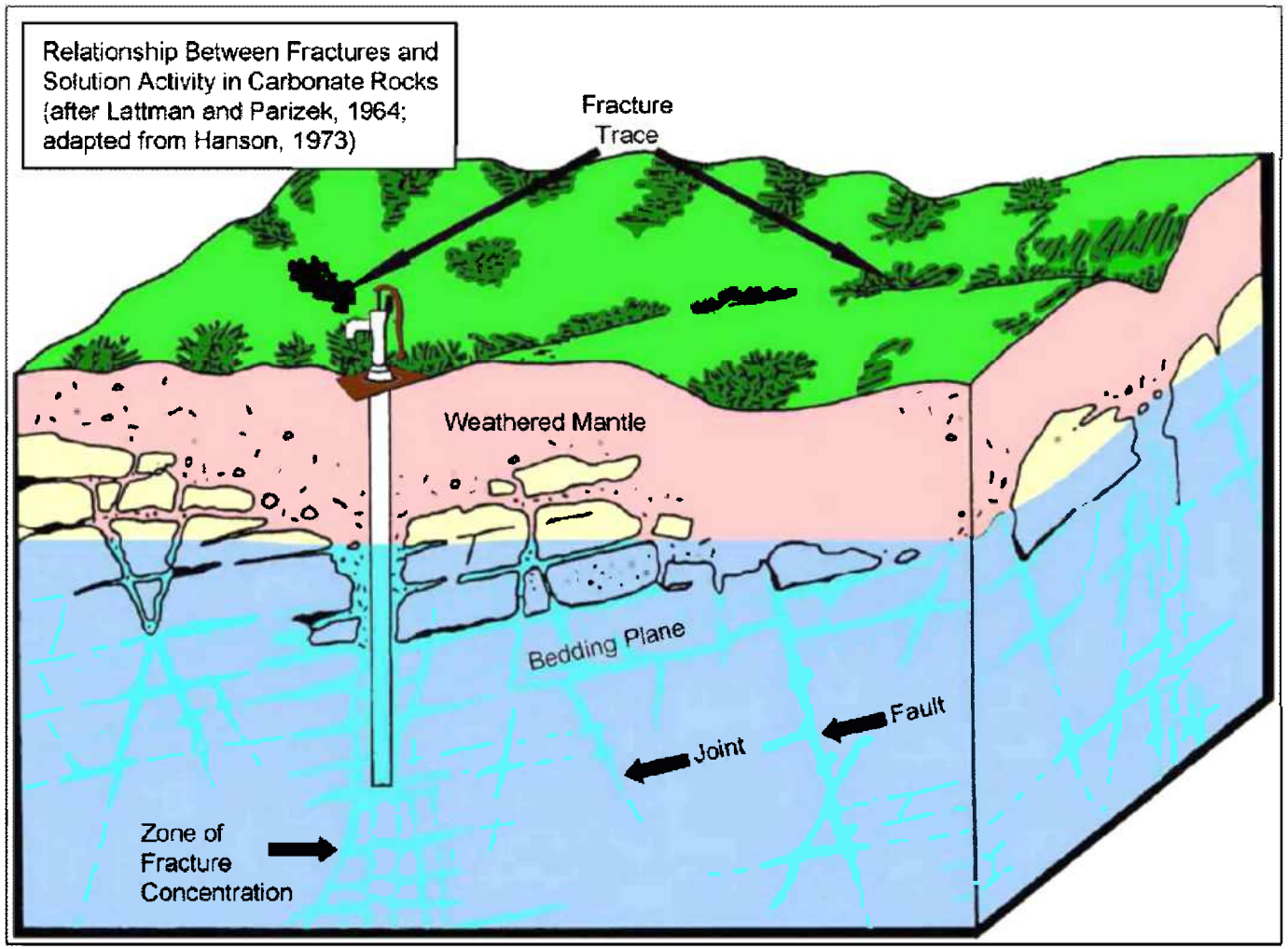


Figure 13. Relationship between fractures and solution activity in carbonate rocks.

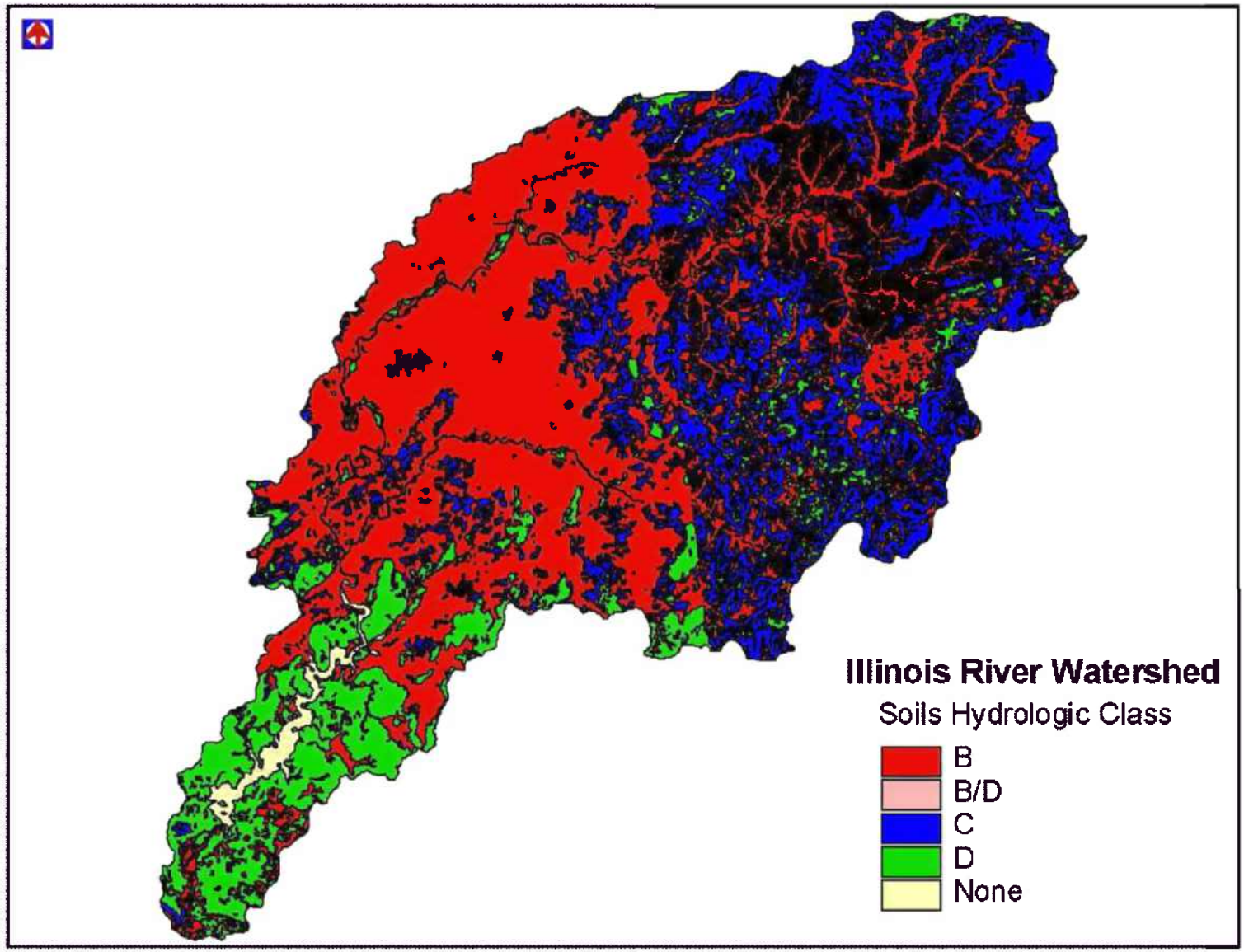


Figure 14. Hydraulic properties of soils within the Illinois River Watershed

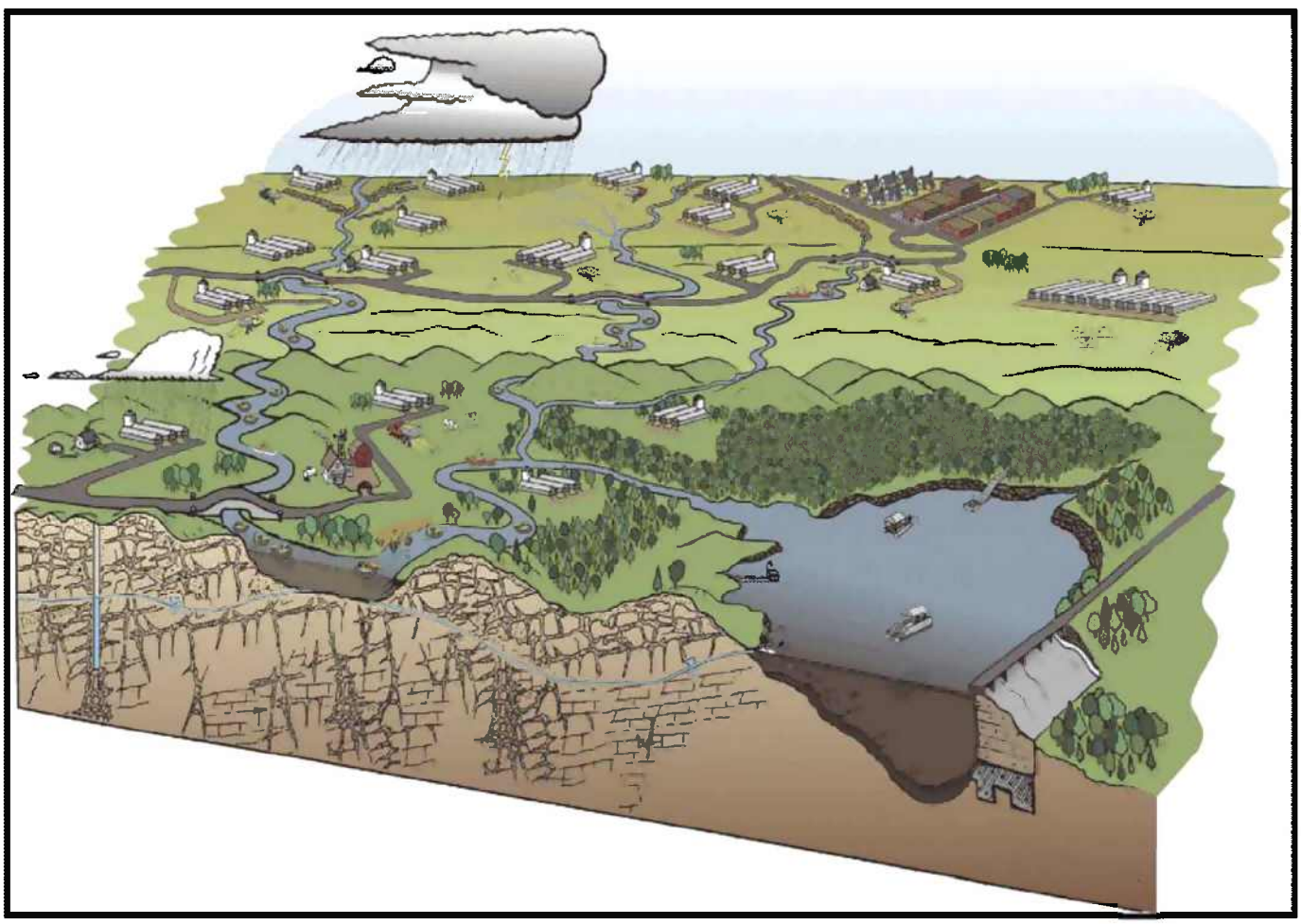


Figure 15. Site Conceptual Model for the Illinois River Watershed

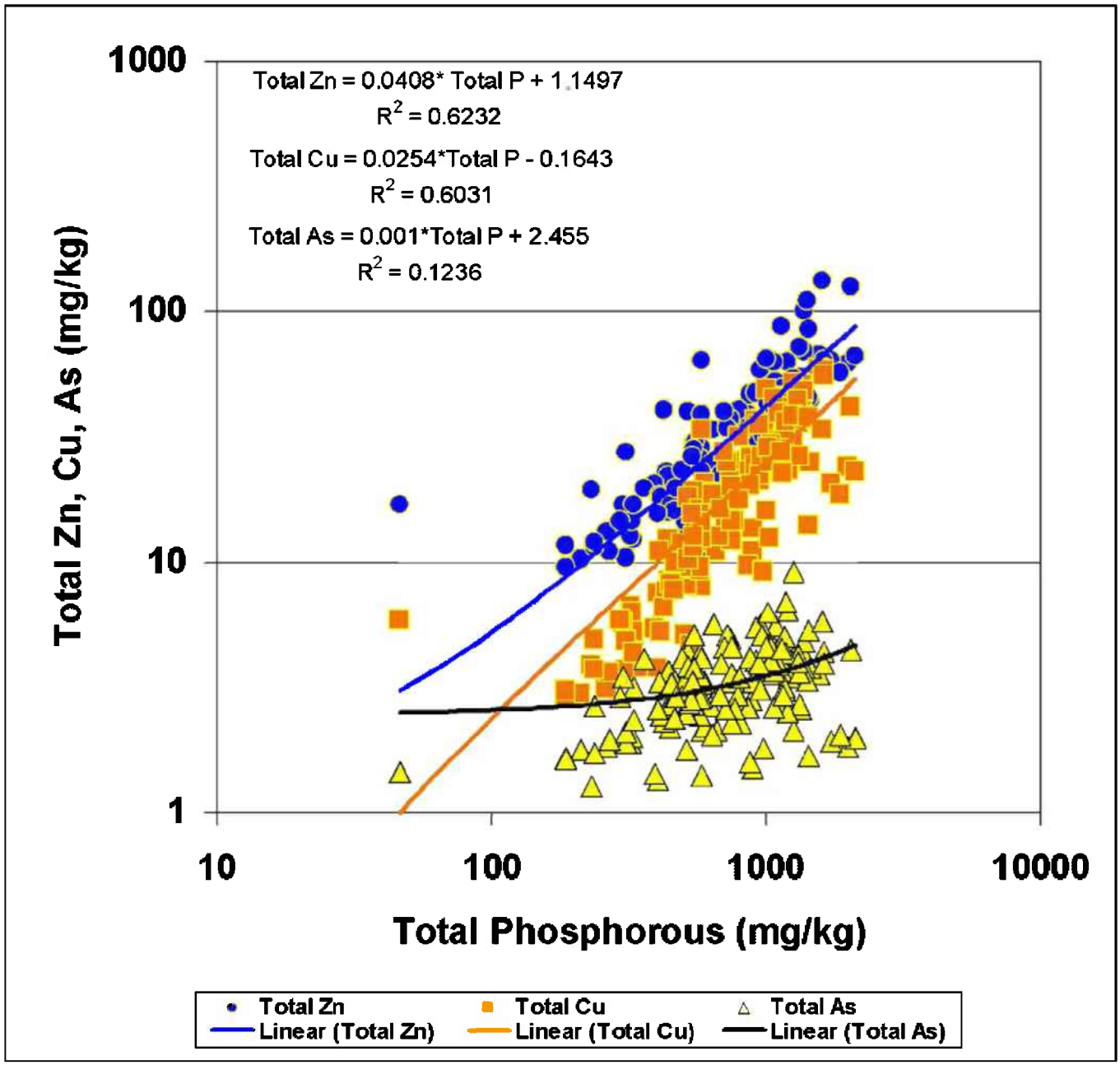
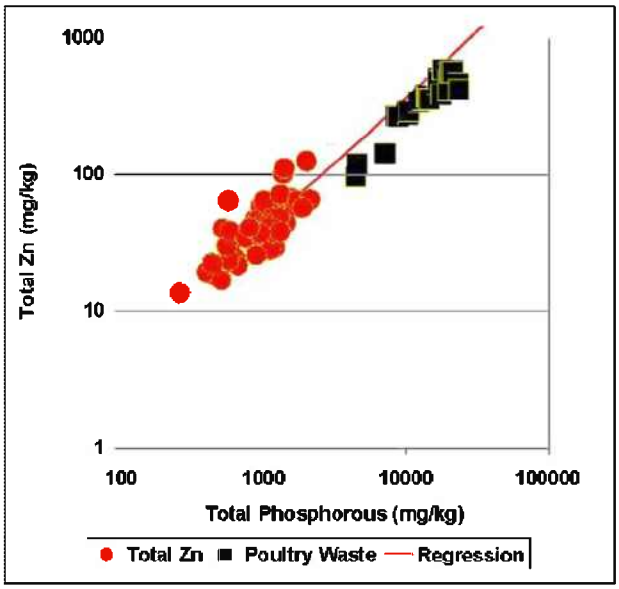
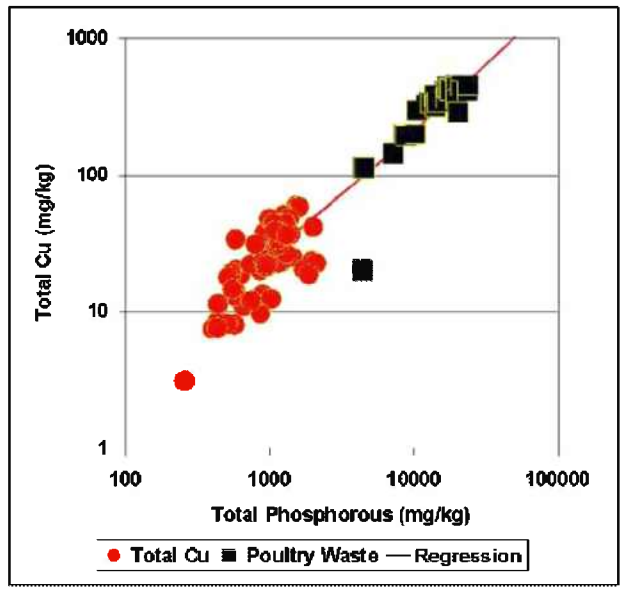


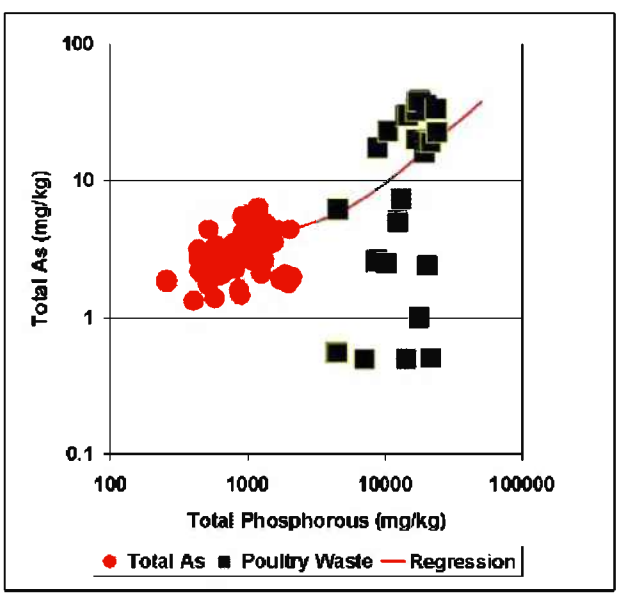
Figure 16. Total Zn, Total Cu and Total As in composited soil samples from litter application location (LAL) soils plotted against Total P (All collection depths: 0-2"; 2-4"; 4-6").



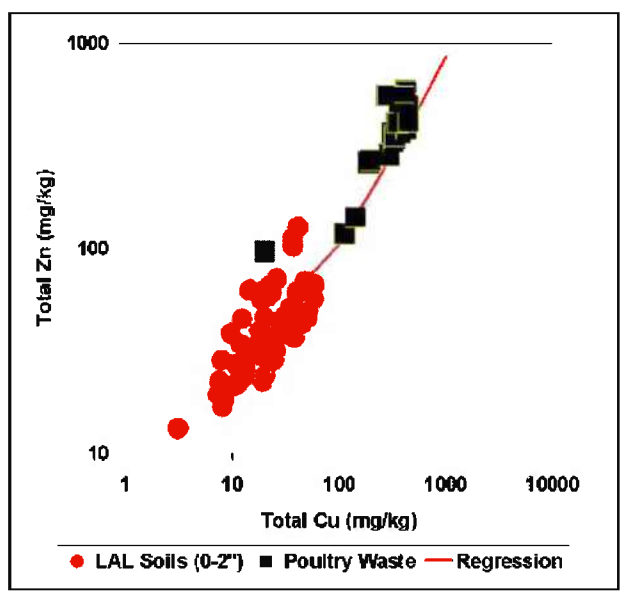
Regression: Total Zn = 0.0351*Total P + 8.030



Regression: Total Cu = 0.0202*Total P + 6.728



Regression: Total As = 0.0007*Total P + 2.523



Regression Total Zn = 0.846*Total Cu + 20.994

Figure 17. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in litter application location (LAL) soil samples (0-2" collection depth) and poultry waste.

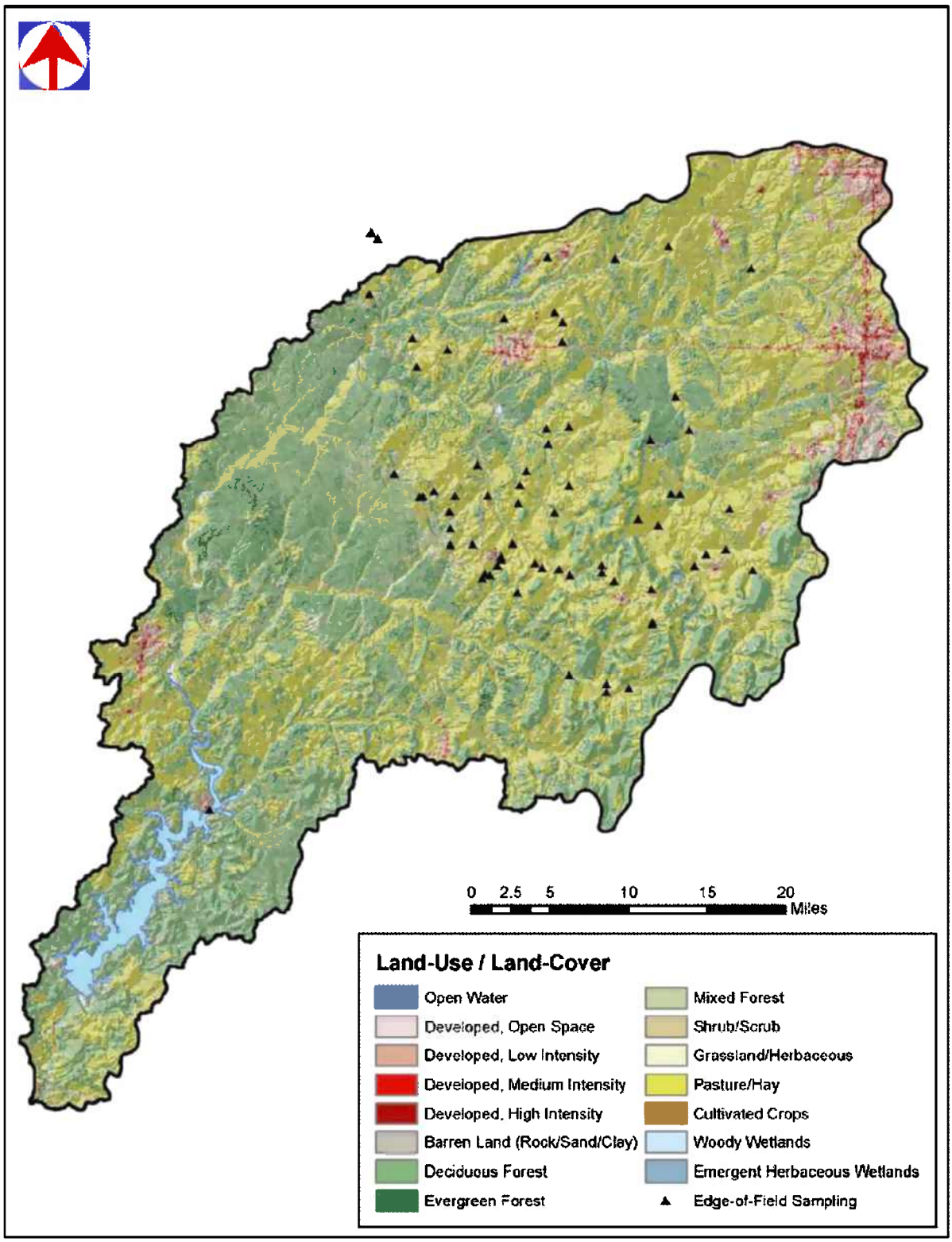


Figure 18. Locations where runoff water (edge of field samples) was collected adjacent to poultry waste disposal sites within the Illinois River Watershed.

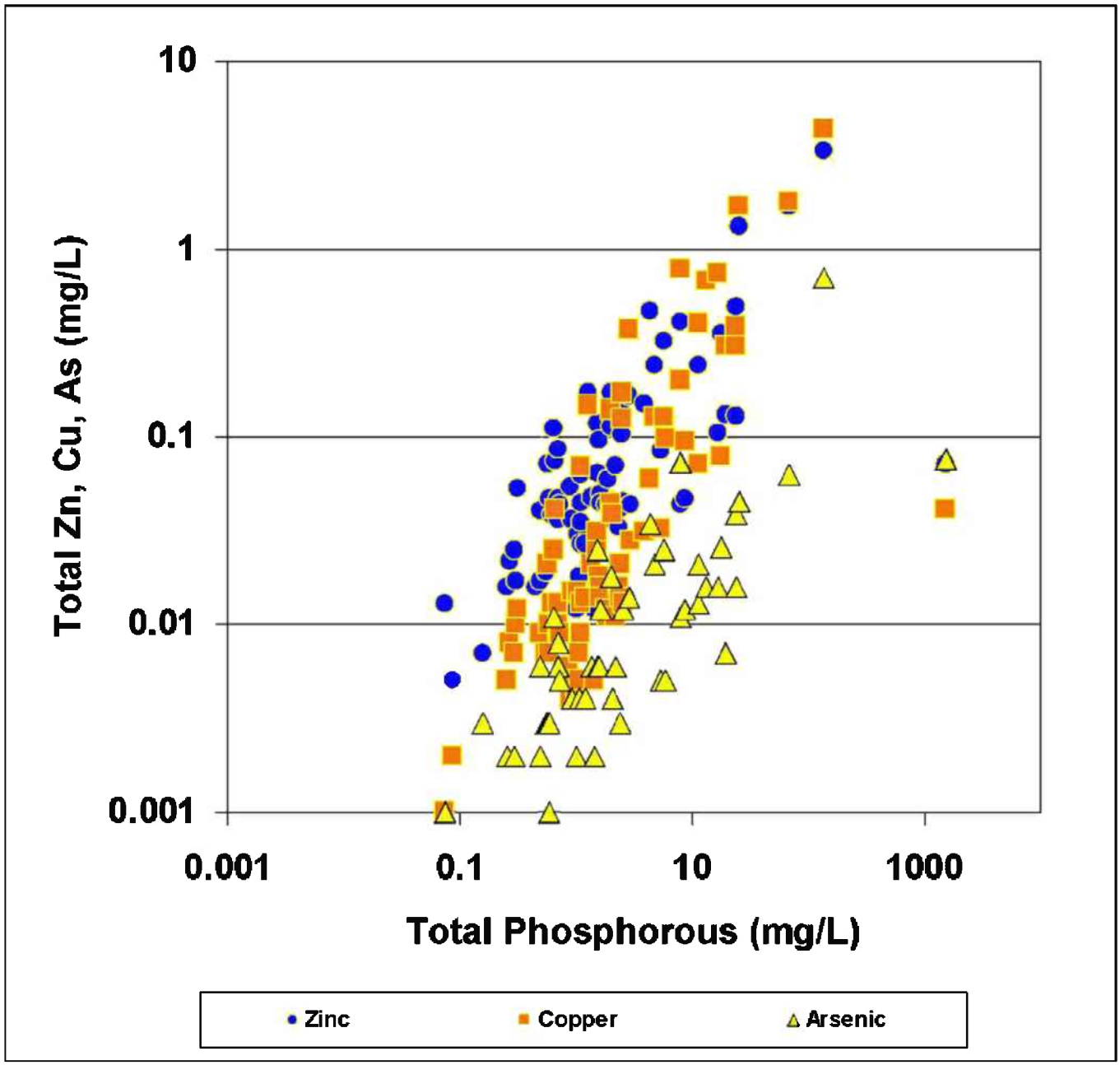
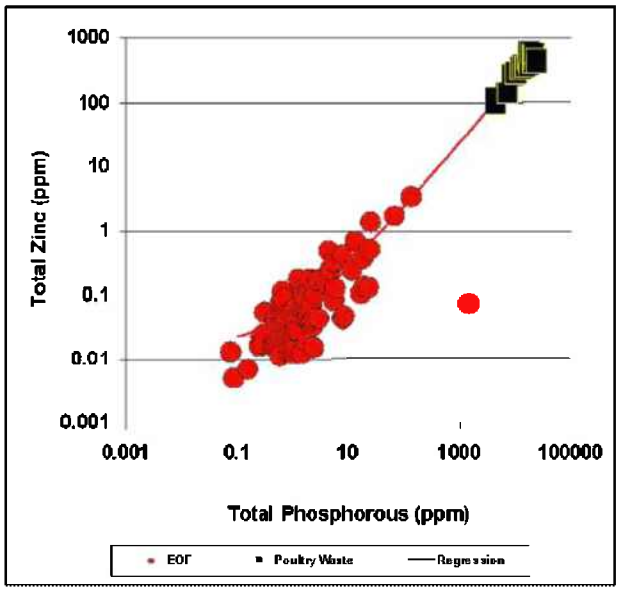
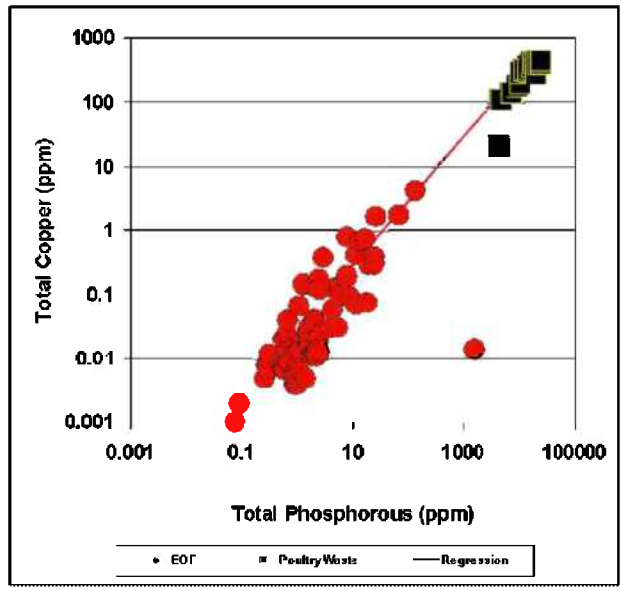


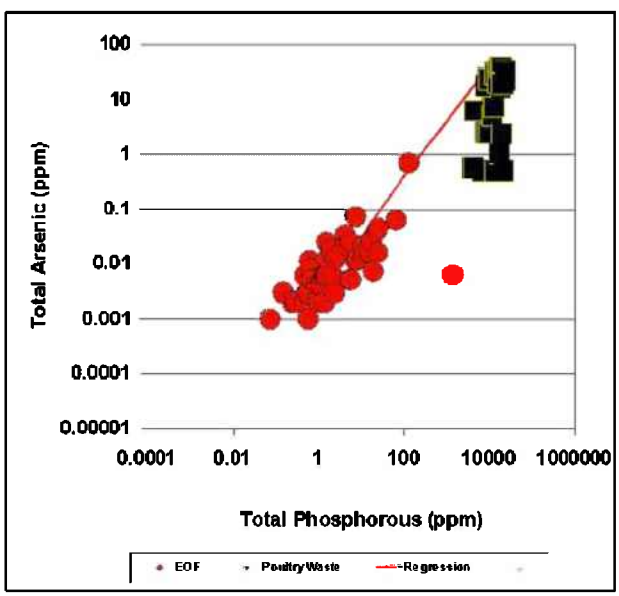
Figure 19. Total Zn, Total Cu and Total As in edge of field runoff samples plotted against phosphorous concentration.



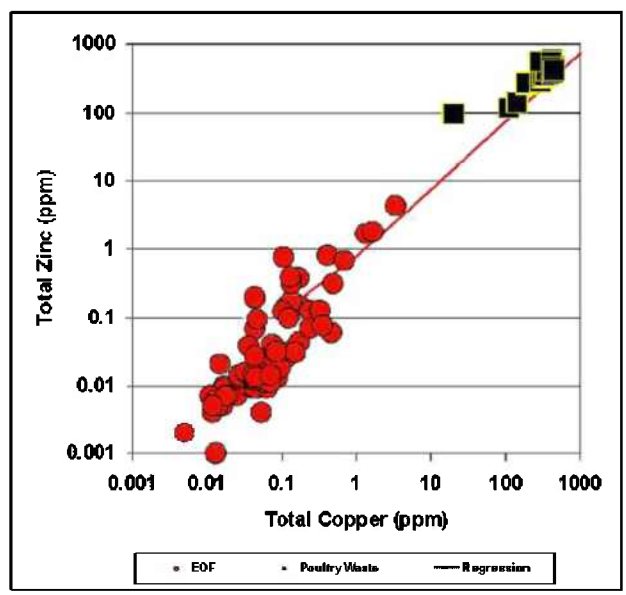
Regression: Total Zn = 0.0246*Total P + 0.0204



Regression: Total Cu = 0.0313*Total P - 0.0156



Regression: Total As = 0.0041*Total P + 0.0104



Regression: Total Zn = 0.759*Total Cu + 0.0387

Figure 20. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in edge of field runoff samples (EOF) and poultry waste.

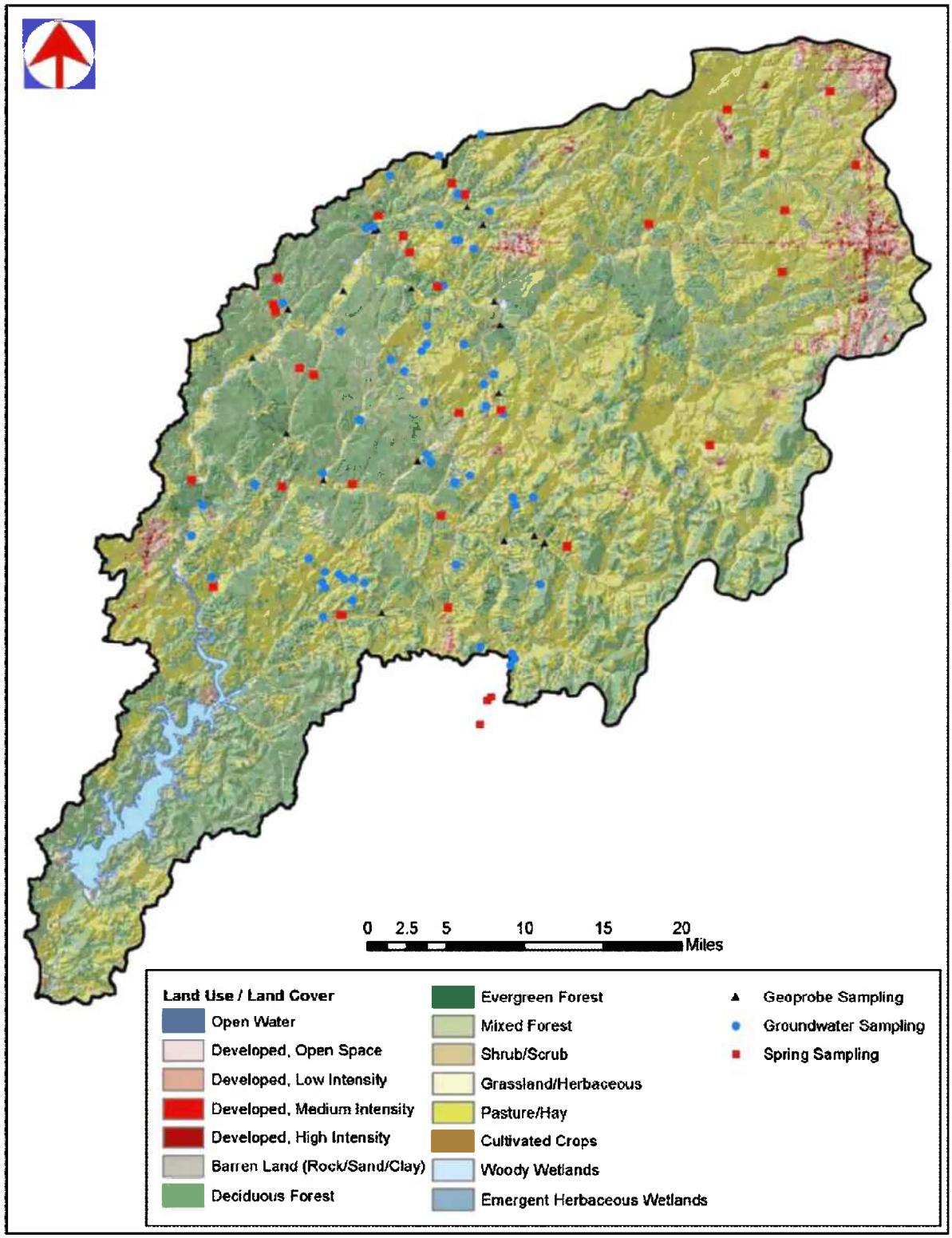
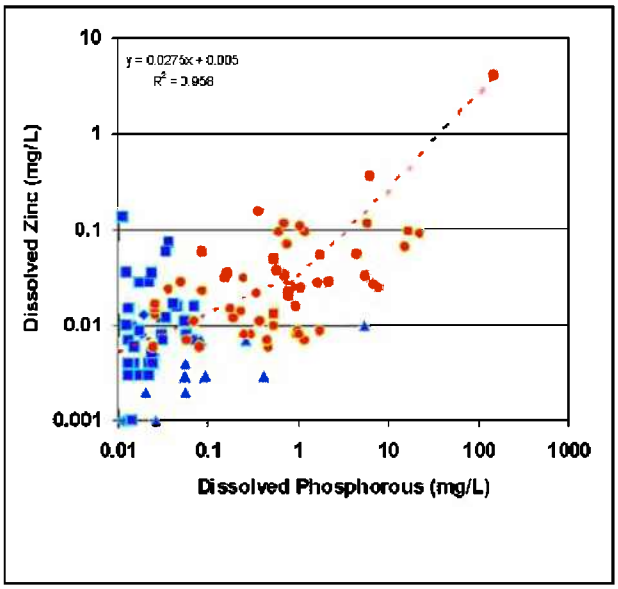
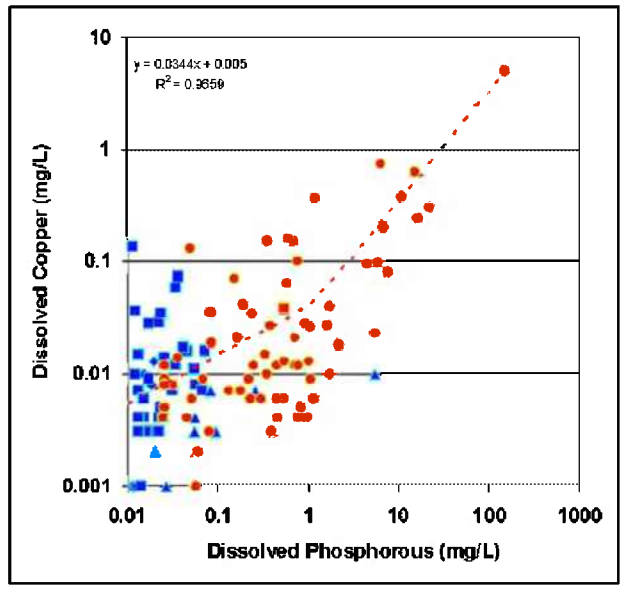
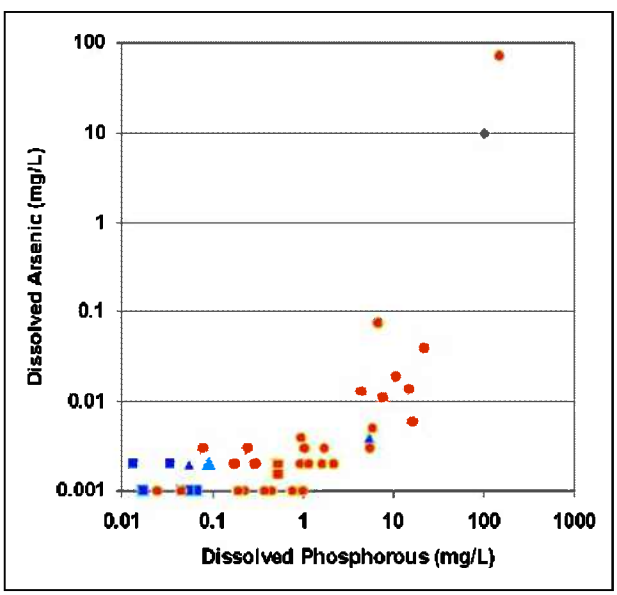
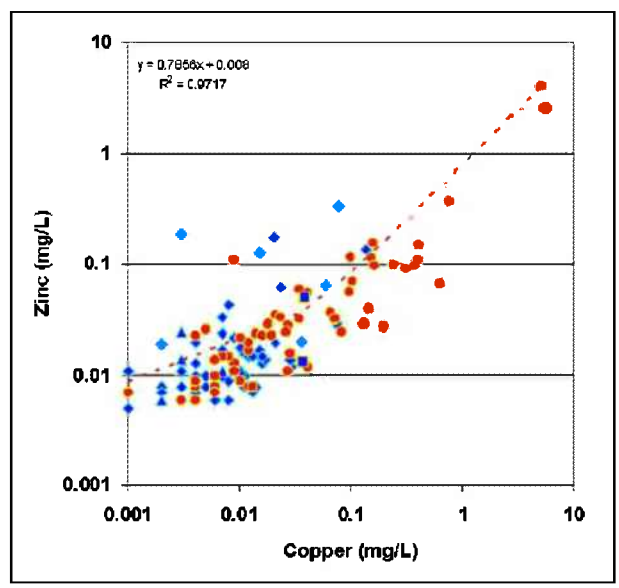


Figure 21. Groundwater collection locations within the Illinois River Watershed showing type of groundwater collection.









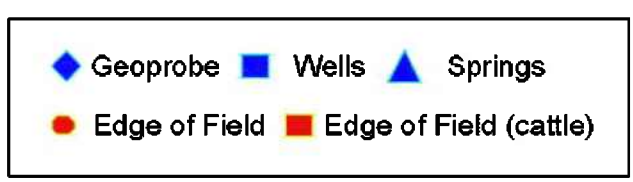


Figure 22. Relationship between the concentrations of dissolved phosphorus, dissolved copper, dissolved zinc and dissolved arsenic found in groundwater samples and dissolved phosphorus, dissolved copper, dissolved zinc and dissolved arsenic found in edge of field runoff samples (EOF).

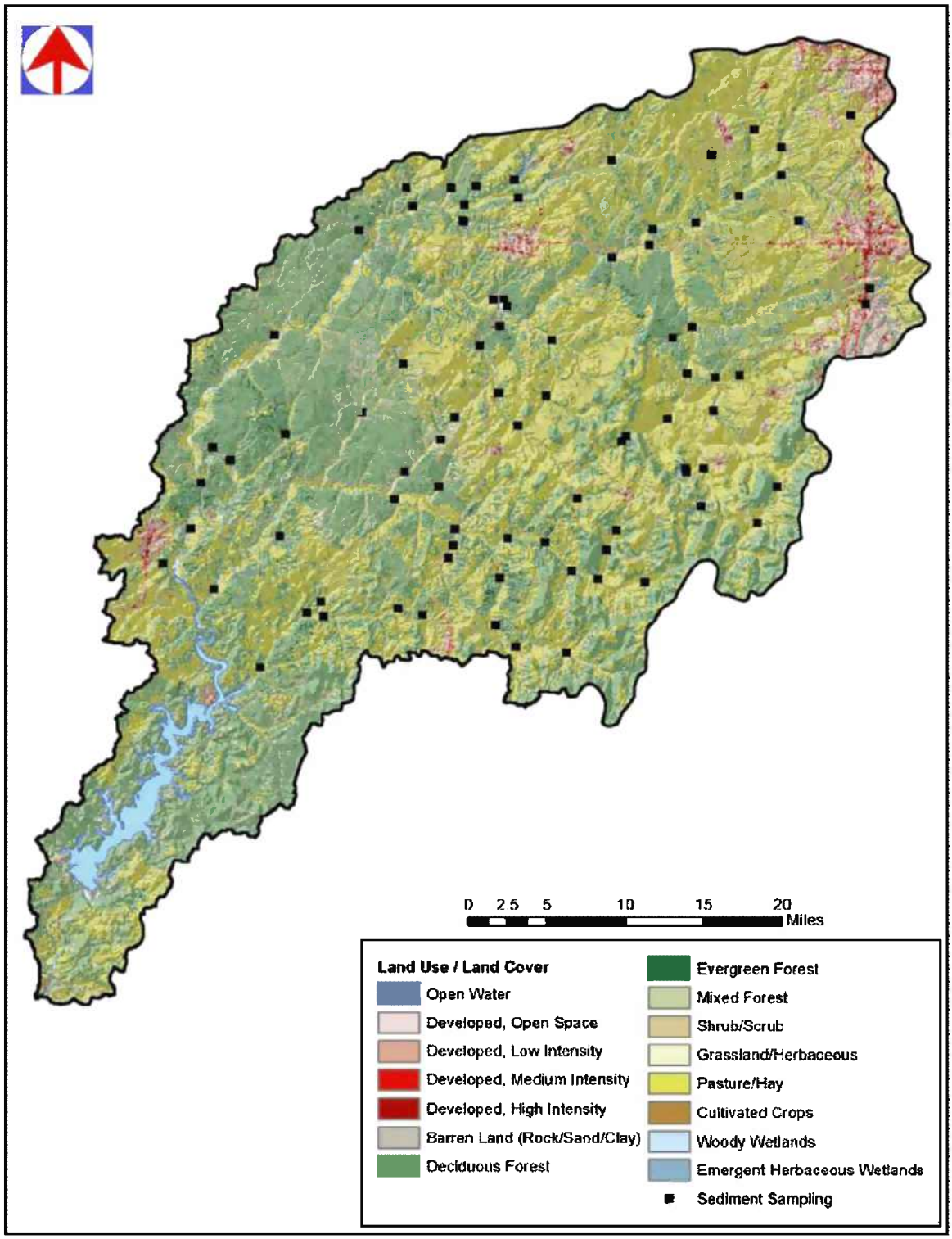


Figure 23. Stream sediment collection locations within the Illinois River Watershed.

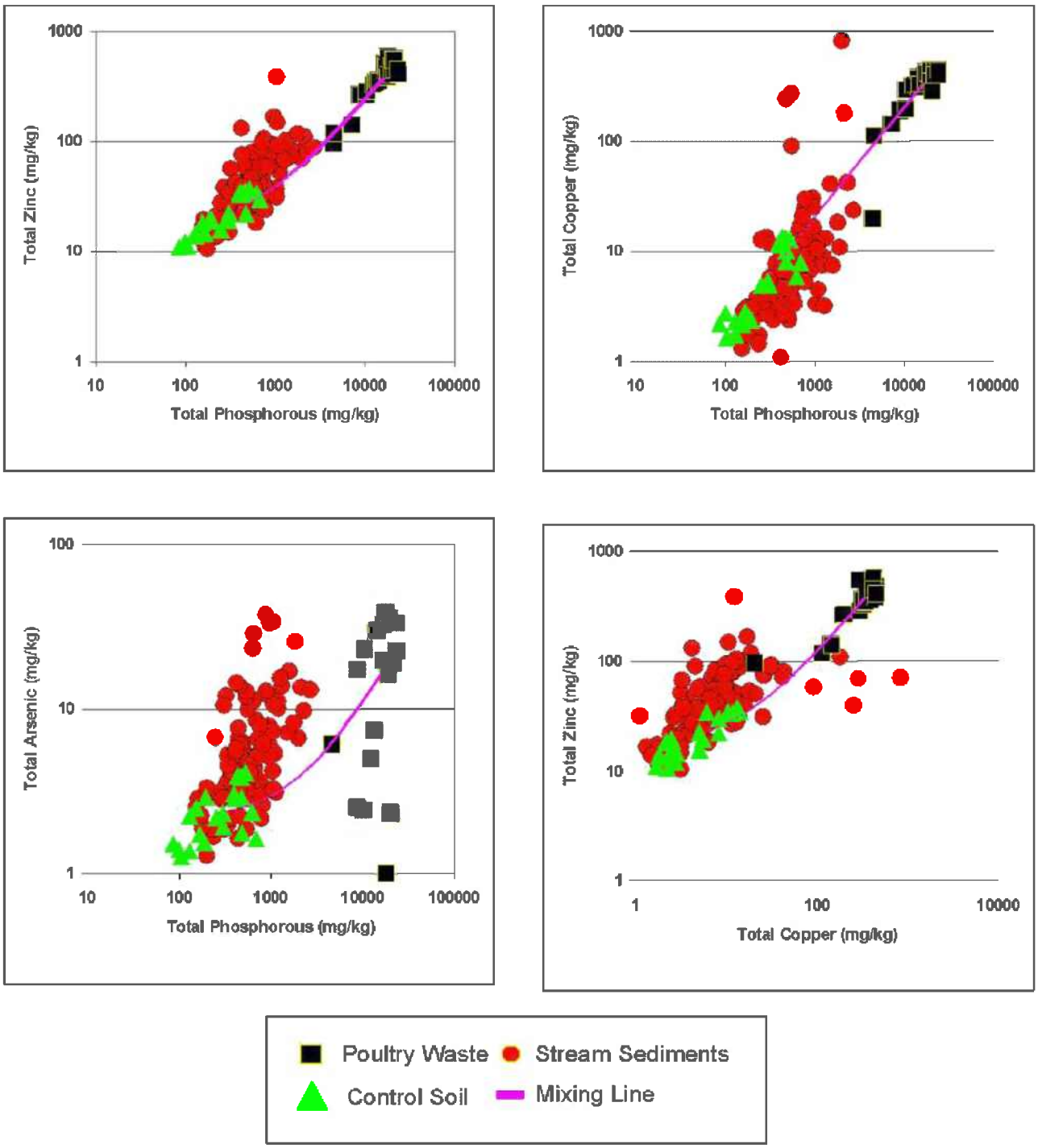
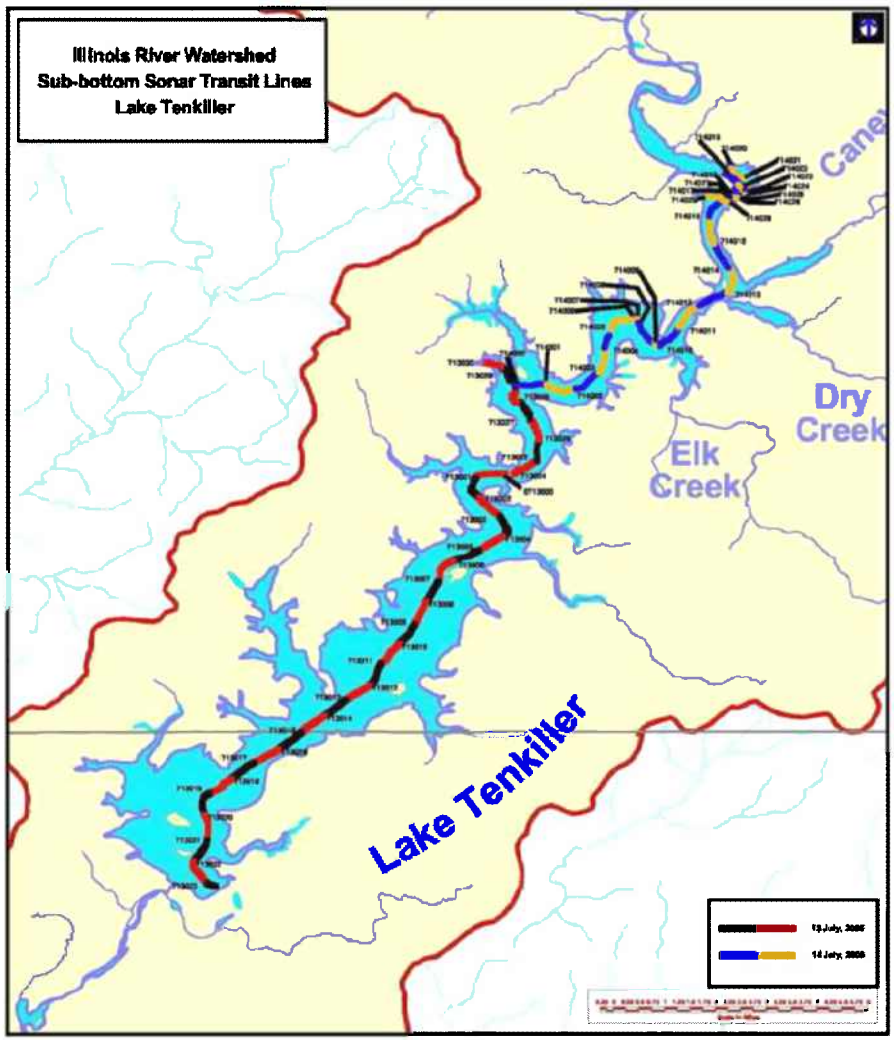


Figure 24. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic in sediments collected form Illinois River Watershed streams, control soils and in poultry waste.



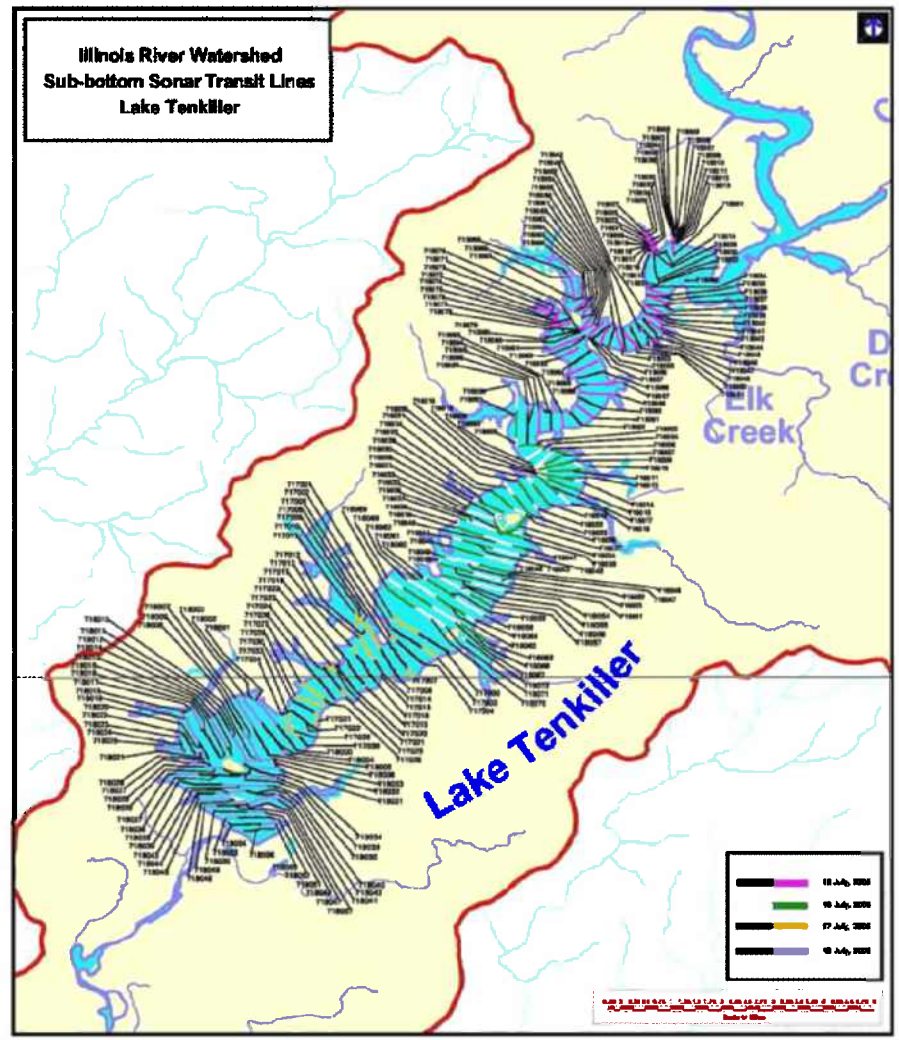


Figure 25. Lake Tenkiller showing the locations of sub-bottom acoustic survey data collection transects.

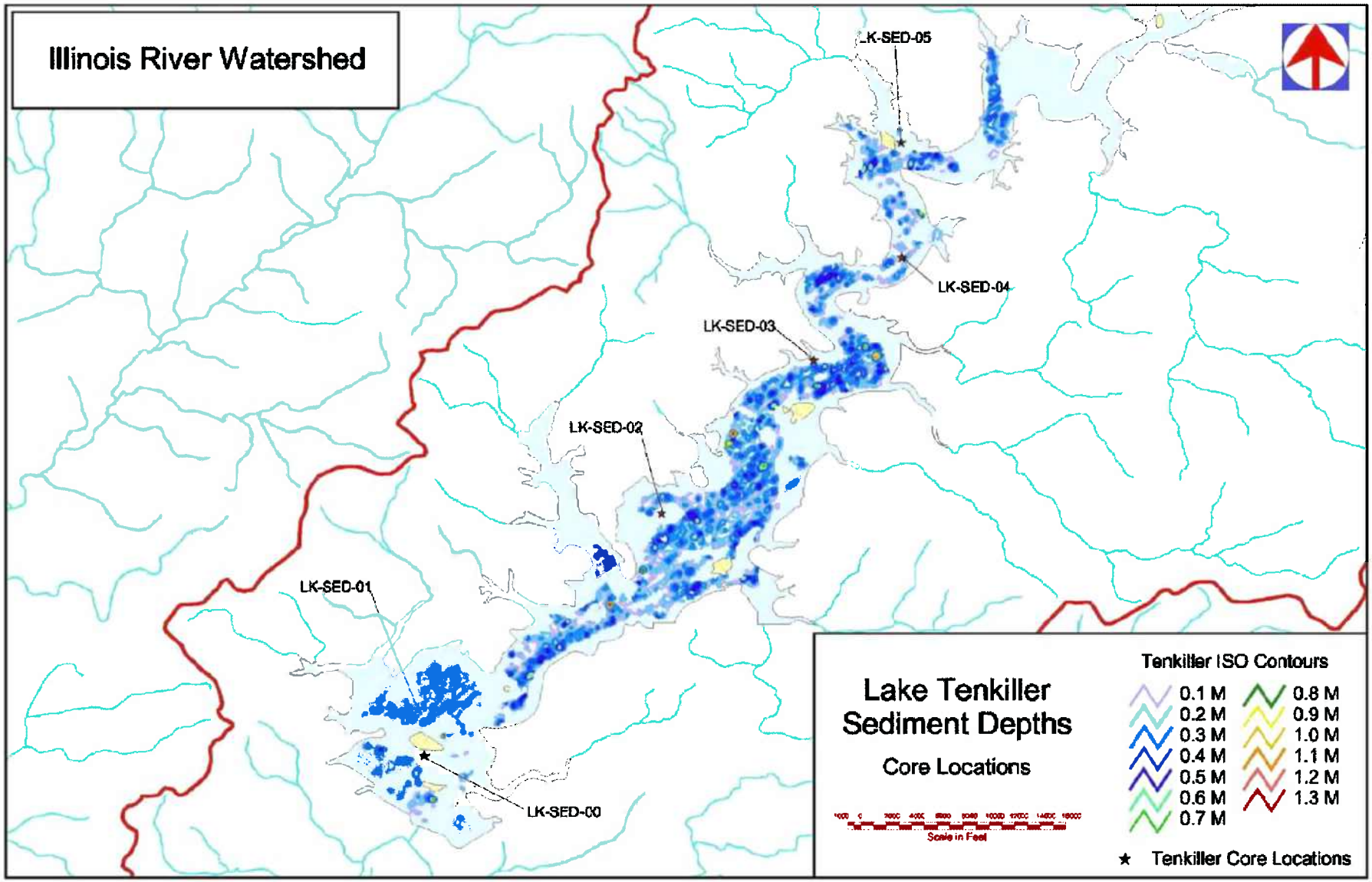


Figure 26. Isopach map of post impoundment sediments in Lake Tenkiller and locations of sediment cores.

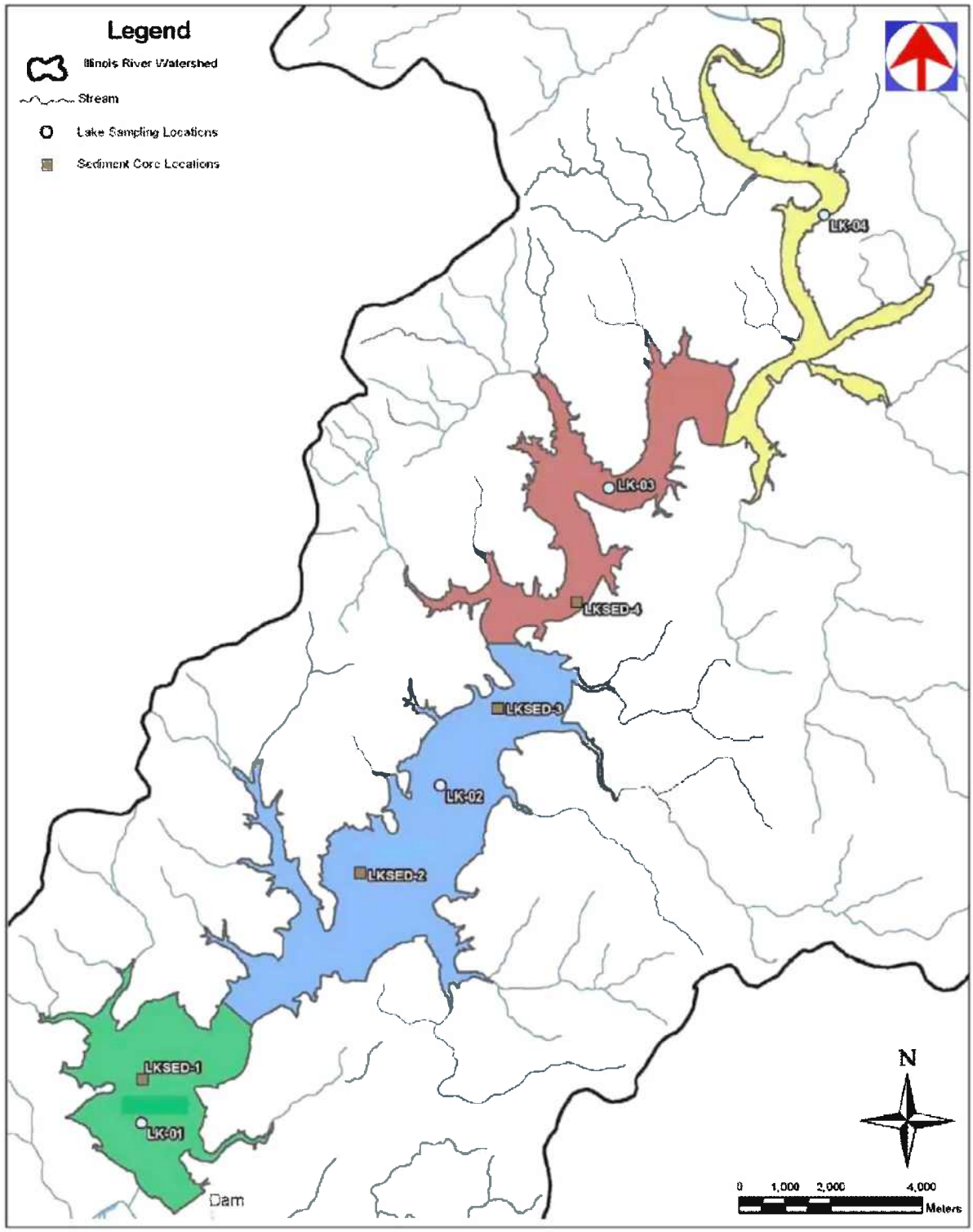


Figure 27. Tenkiller showing water and core sampling locations and approximate reservoir zones: Riverine – yellow, Transition – red and Lacustrine – blue and green

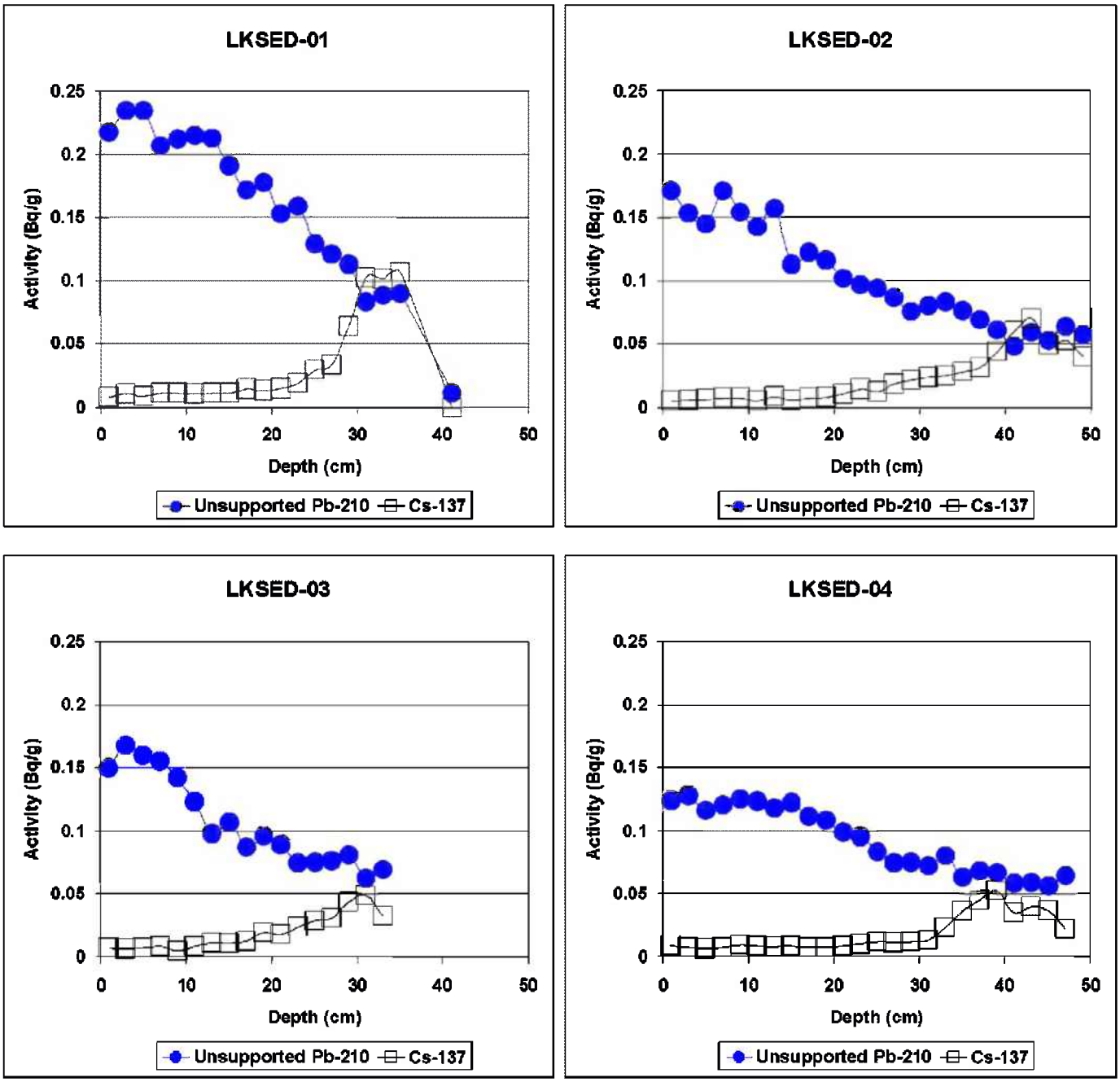
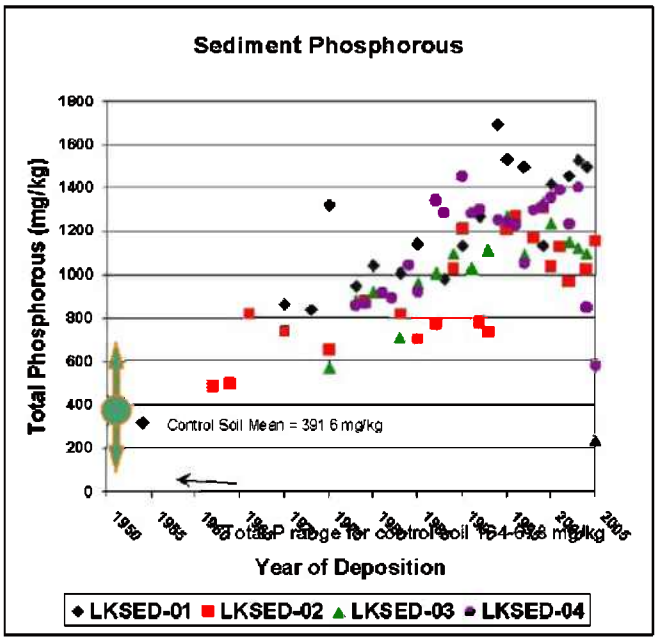
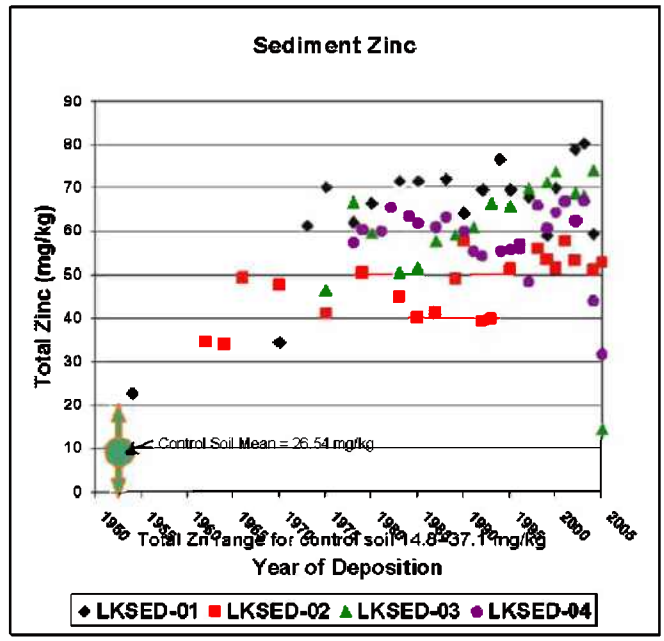
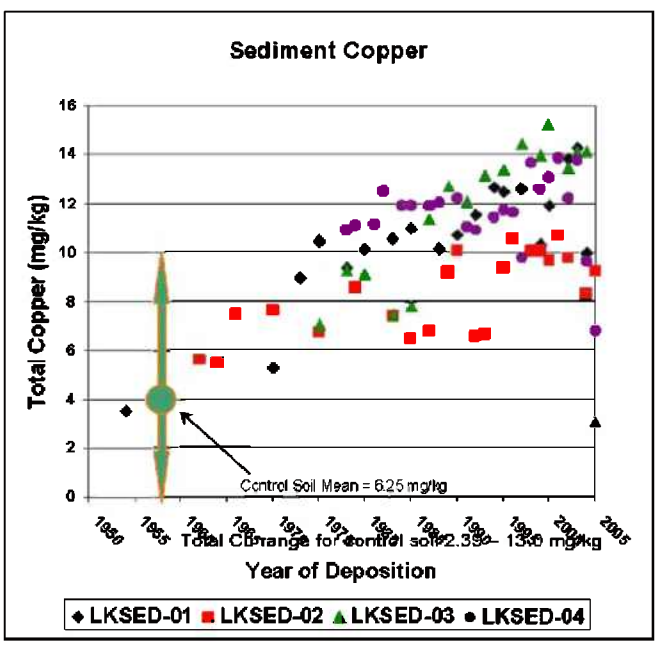


Figure 28. Measured activity of Pb-210 and Cs-137 in sediment cores collected from Lake Tenkiller.







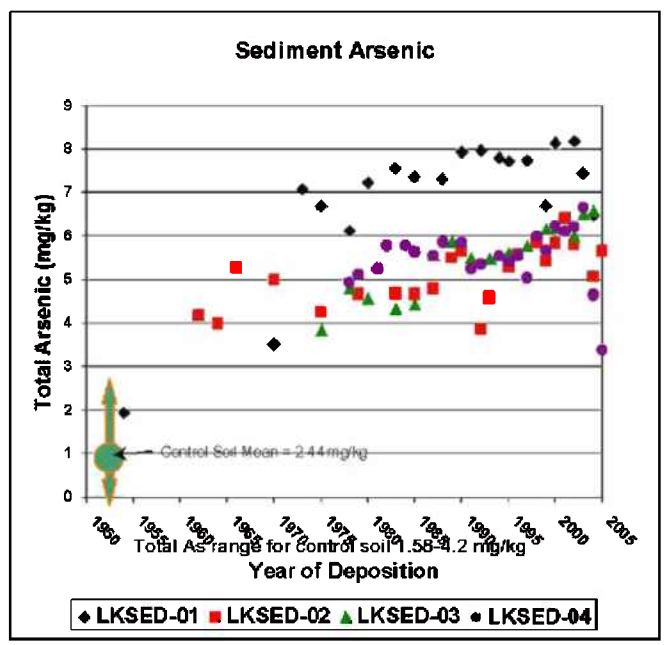


Figure 29. Concentrations of total phosphorus, total zinc, total copper and total arsenic found in sediment cores collected from Lake Tenkiller plotted against age of deposition with comparison to values for total phosphorus, total zinc, total copper and total arsenic obtained from control soils.

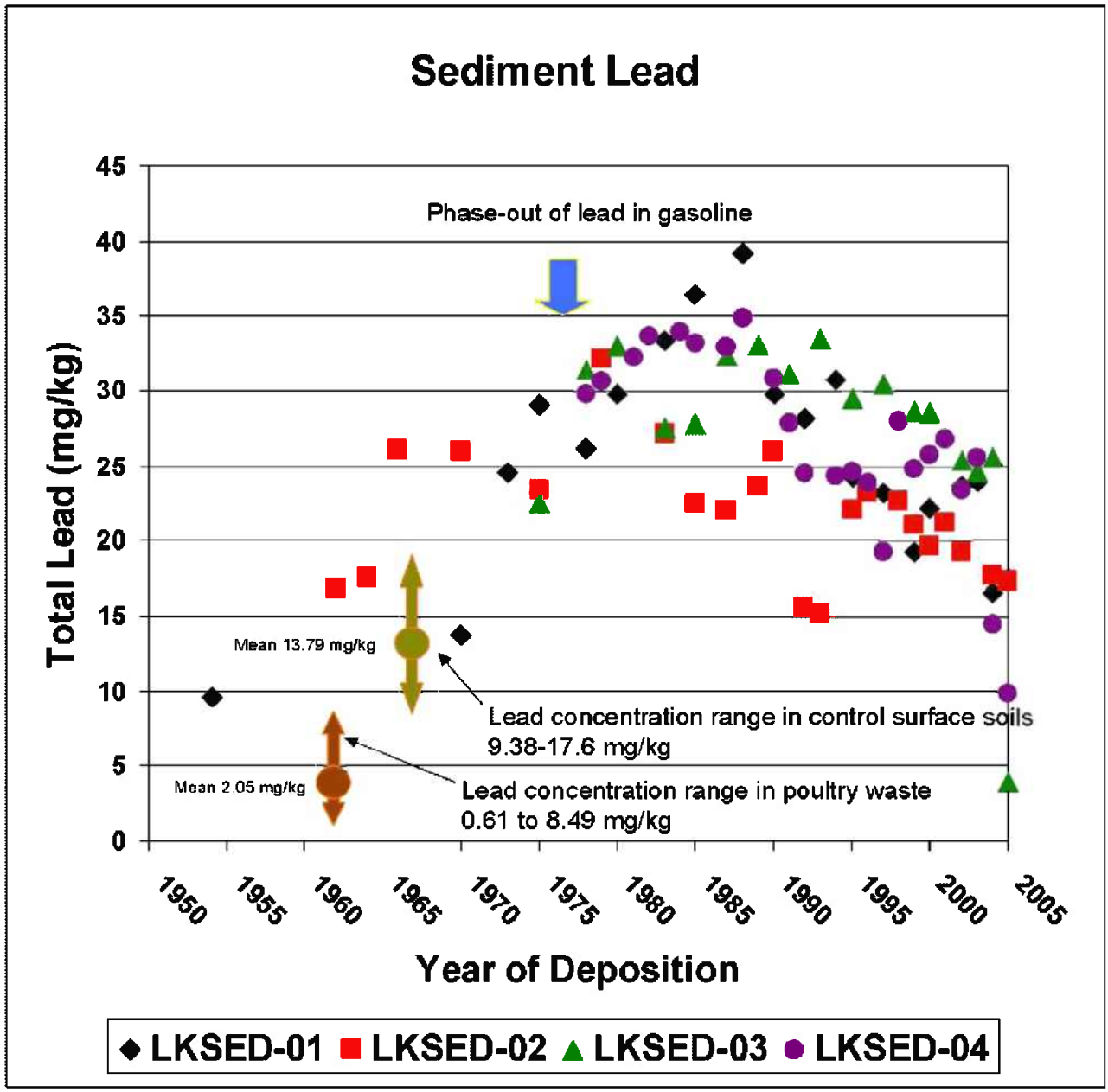
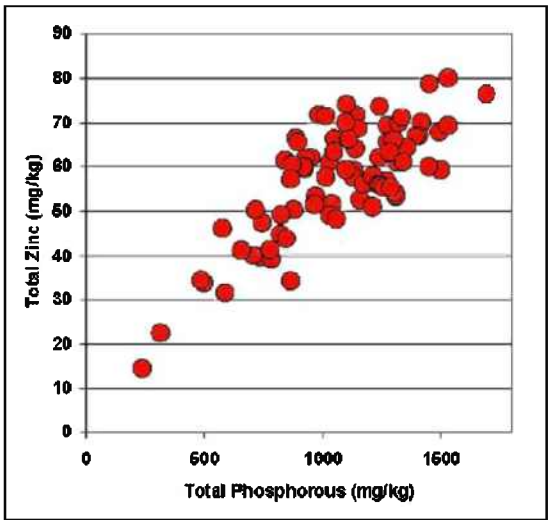
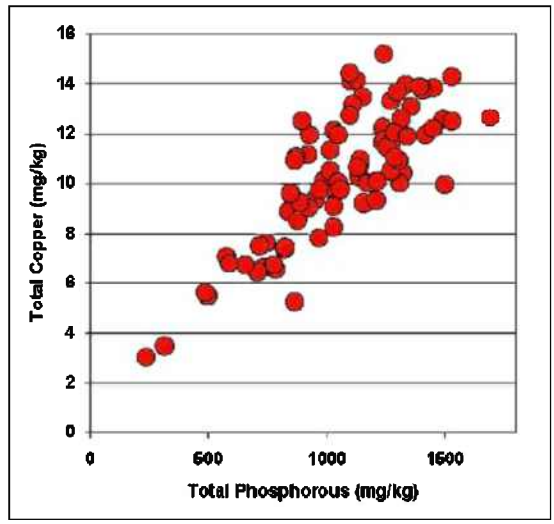
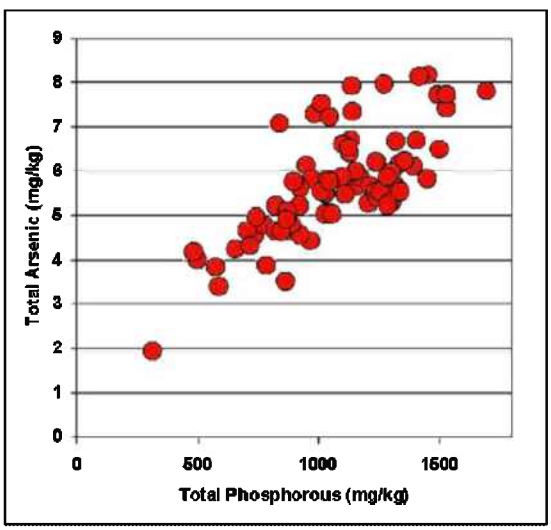
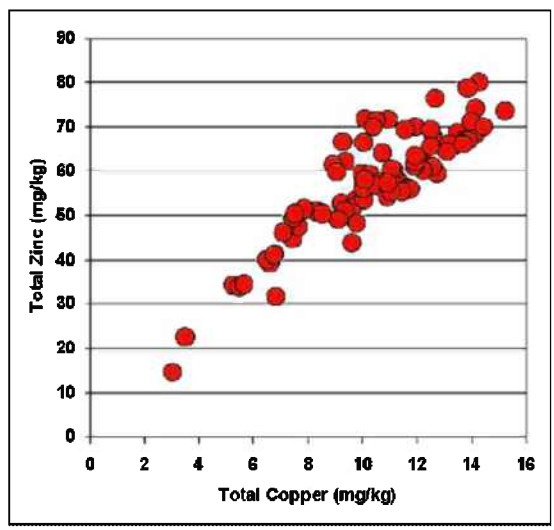


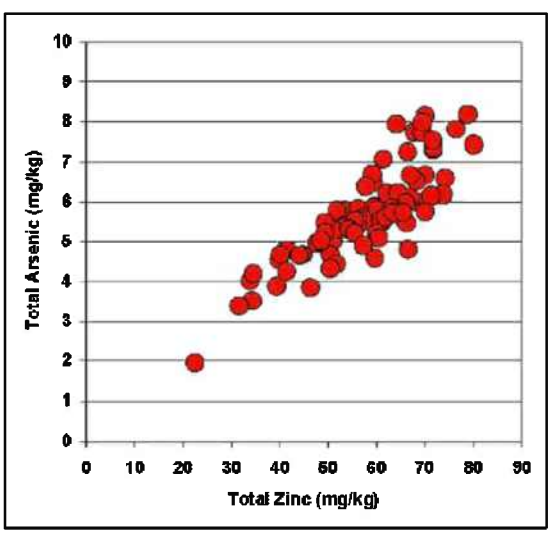
Figure 30. Concentrations of total lead found in Lake Tenkiller sediment cores plotted against age of deposition with comparison to values obtained for poultry waste and for control soils.











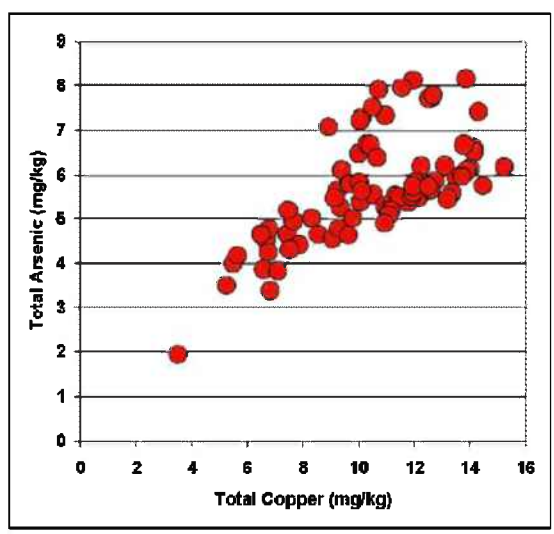
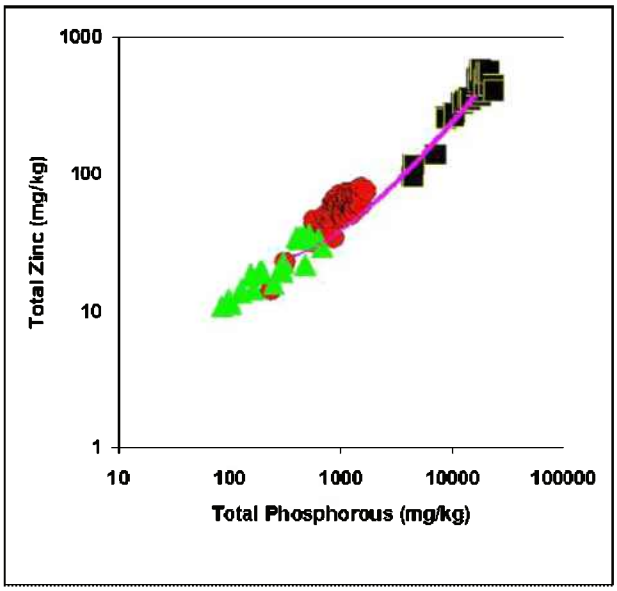
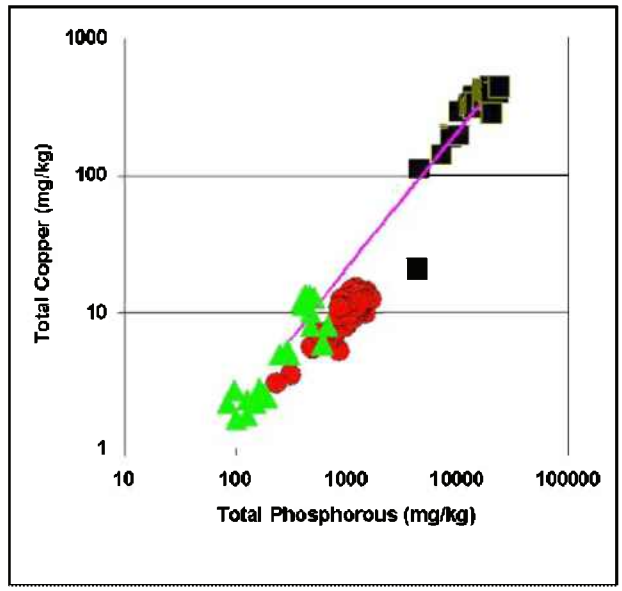
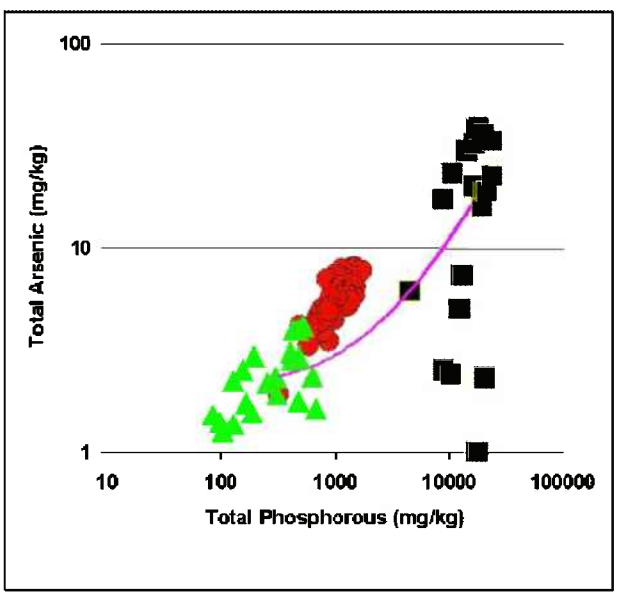


Figure 31. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in sediments collected in Lake Tenkiller sediment cores.







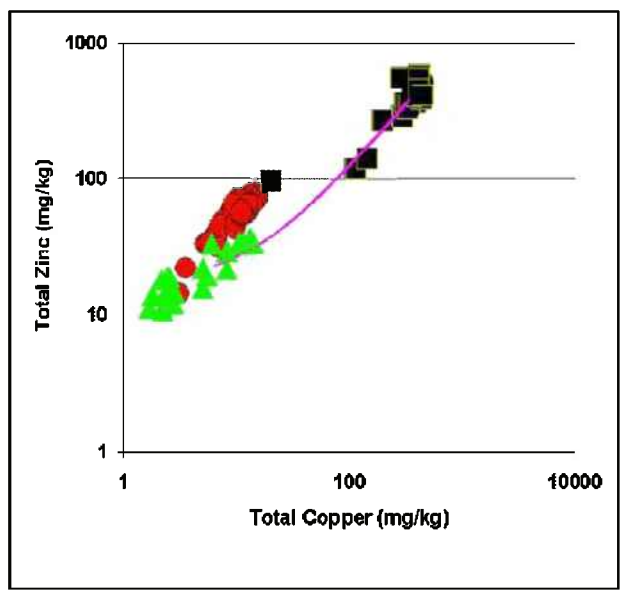


Figure32. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in sediments collected in Lake Tenkiller sediment cores, uncontaminated soils and in poultry waste.

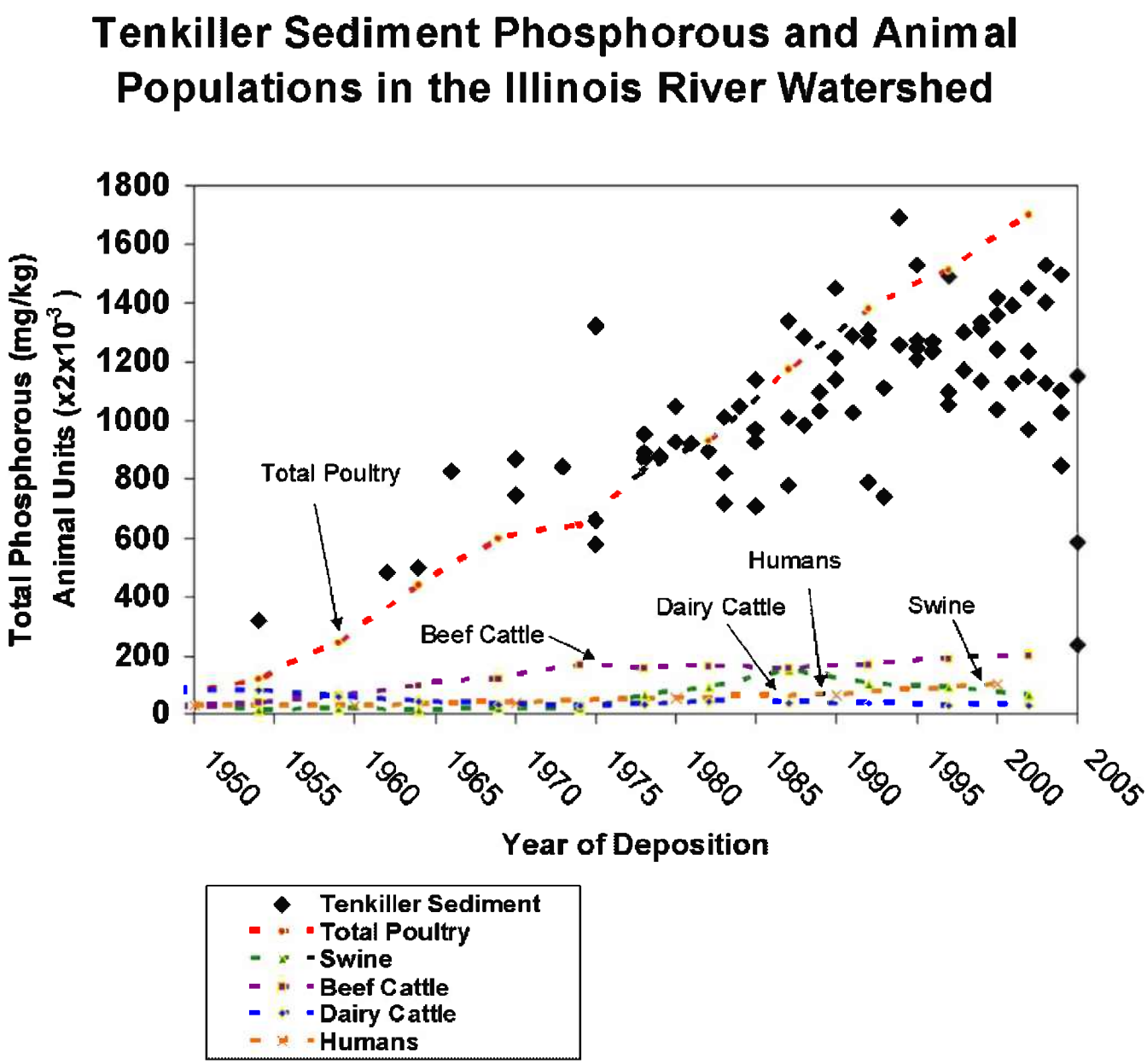


Figure 33. Total phosphorous concentrations in Lake Tenkiller sediment cores as a function of age of sediment deposition and populations of total poultry, beef cattle, dairy cattle, swine and humans in the Illinois River Watershed in animal units (AUs).