

The Changing Face of the UMR Basin



Agriculture

Selected Profiles of Farming and Farming Practices

The Changing Face of the UMR Basin

Agriculture: Selected Profiles of Farming and Farm Practices

September 2000

National Audubon Society
Upper Mississippi River Campaign
26 East Exchange Street, Suite 110
St. Paul, MN 55101
Dan McGuinness, Director
651-290-1695
www.audubon.org/campaign/umr
dmcguinness@audubon.org

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Project Consultants:

School Grove Group
Alan Consulting
2605 13th Ave E
North St. Paul, MN 55109
651-748-8887
alan.rf@schoolgrove.com

Geographic North
GIS Services
St. Paul, Minnesota
Jim Von Haden, Principal
651-225-8050
jvonhaden@geographicnorth.com

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The Changing Face of the UMR Basin

Millions of years of geologic activity and thousands of years of glacial activity have defined the Mississippi River drainage basin. Dramatic changes in the landscape and in the composition of flora and fauna have occurred without the influence of human actions, taking thousands, even millions, of years to evolve. Yet human settlement, a mere speck on earth's geologic timeline, has forever changed the dynamics and diversity of the Basin's ecosystems.

Humans are manipulators of natural systems. This ability to transform landscapes has converted nearly 67% of the Upper Mississippi River (UMR) basin land area¹ from tall-grass prairie, oak savanna and hardwood forest ecosystems to an *agro-ecosystem*. The most dramatic of these changes have occurred within the past 170 years. These changes have been wrought with almost incomprehensible speed; especially when compared to rate of change measured in the thousands and millions of years that the ecosystems of the UMR basin had previously undergone.

The term agro-ecosystem describes a highly altered landscape in which naturally occurring flora has been cleared, naturally occurring drainage systems altered and soil fertility enhanced for the cultivation of highly desirable food and fiber crops. These are man-made agricultural landscapes. This transformation of 67% of the UMR basin landscape was not a random act. From 1820 – 1930 there seemed to be no other choice. Supplying food and fiber to an ever-expanding and increasingly urban population was a necessity. America was a young country (still is for that matter) and the national psyche at the time was to exploit our natural resources for national and economic gain.

This exploitation over the past 170 years has created social, economic and environmental problems that are complex, perplexing and far more socially derisive than anything we could have imagined. Problems and issues facing the UMR basin and the Mississippi River include, but are not limited to:

¹ The data from the USDA 1997 Census of Agriculture presented in this report indicates approximately 67% of the UMR basin land area is devoted to agriculture. Other sources (i.e. other UMR basin analyses and reports) state nearly 61% of the UMR basin land area is in agricultural land use. The differences in calculation are likely due to the methodology used to determine what land area is used for agricultural pursuits. The 1997 Census of Agriculture includes pastureland in wooded areas as well as certain land areas that are used to support agriculture (e.g. land for grain storage, buildings, support roads, etc.) and uses a farmer sampling survey technique to determine acreage in agricultural land use. Other methods to estimate agricultural land use employ satellite imagery to gather data for analysis.

- Loss of wildlife habitat and habitat diversity
- Sedimentation of river floodplain backwaters
- Excessive nutrient-laden runoff and expansion of the Gulf of Mexico hypoxia zone
- Competing resource use and management needs
- Water quality degradation from urban, industrial and agricultural land uses
- Conflicting national environmental and economic development policies
- Water and land resource use, social and environmental justice imbalances
- Knowledge gaps concerning the consequences of rapid, human-induced environmental change.

National and Five State Regional Background information

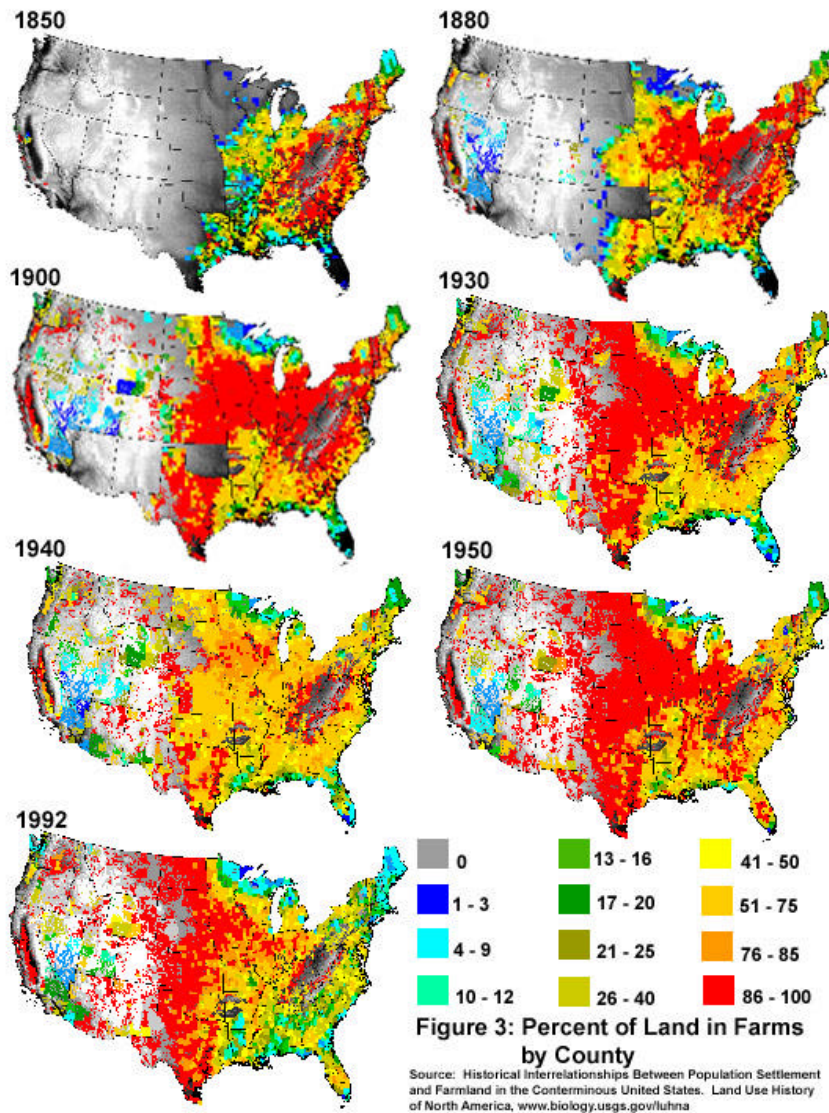
Prior to European settlement, the UMR basin landscape appeared much different than it does today. Figure 1, on page 5, illustrates the extent of natural vegetation had European settlement not occurred. Figure 2, page 6, illustrates the current land cover condition within the UMR basin. Much (i.e. 95% – 99% in most instances) of the native prairies, savannas and prairie/forests have been converted to agricultural use. Also note that the major urban areas within the basin are primarily situated on and along rivers.

The conversion of the nation’s landscape to an agricultural production landscape is illustrated graphically in Figure 3, Percentage of Land in Farms, 1850 –1992 (following page). Table 1 illustrates numerically the percentage of total land area in farms. After peaking in 1950, notice how the percentage of land in farms has declined slightly. Part of this decline can be attributed to the conversion of agricultural land to urban land uses.

	1920	1930	1940	1950	1959	1969	1982	1992	1997
Iowa	94.1	95.6	95.3	95.5	94.3	93.8	91.2	87.6	87.2
Illinois	89.1	85.6	86.7	86.5	84.7	84.1	80.7	76.5	76.5
Minnesota	58.4	59.7	63.7	64.2	60.1	56.5	54.3	50.3	51.0
Wisconsin	62.6	61.9	65.3	66.3	60.4	52.1	49.5	44.5	42.9
Missouri	79.1	76.7	78.4	79.3	74.9	73.6	66.6	64.8	65.4

Table 1. UMR Basin States: Approximate Percentage of Total Land Area in Farms

Source: USDA, Census of Agriculture



Another phenomenon occurring nationally and regionally within the agricultural sector is an increase in the average farm size as noted in Table 2: UMR Basin States, Average Farm Size.

	1920	1950	1959	1964	1969	1974	1978	1982	1987	1992	1997
Iowa	157	169	194	219	239	262	274	283	301	325	343
Illinois	134	158	196	226	242	262	282	292	321	351	372
Minnesota	169	183	211	235	260	280	288	294	312	342	354
Wisconsin	117	139	161	172	183	197	206	210	221	228	227
Missouri	132	153	197	222	237	258	262	260	275	291	292

Table 2. UMR Basin States: Average Farm Size
Source: USDA, Census of Agriculture, 1997

Increasing average farm size has implications for:

- The total number of farm operators/owners
- The scale of mechanization and adoption of modern farming practices (operators of larger farm sizes tend to be early adopters of advanced farming methods and machinery)
- The perspectives that the owner/operator brings to decision-making in their farming business operations.

These factors have implications for how land stewardship messages are received and acted upon by farm operators.

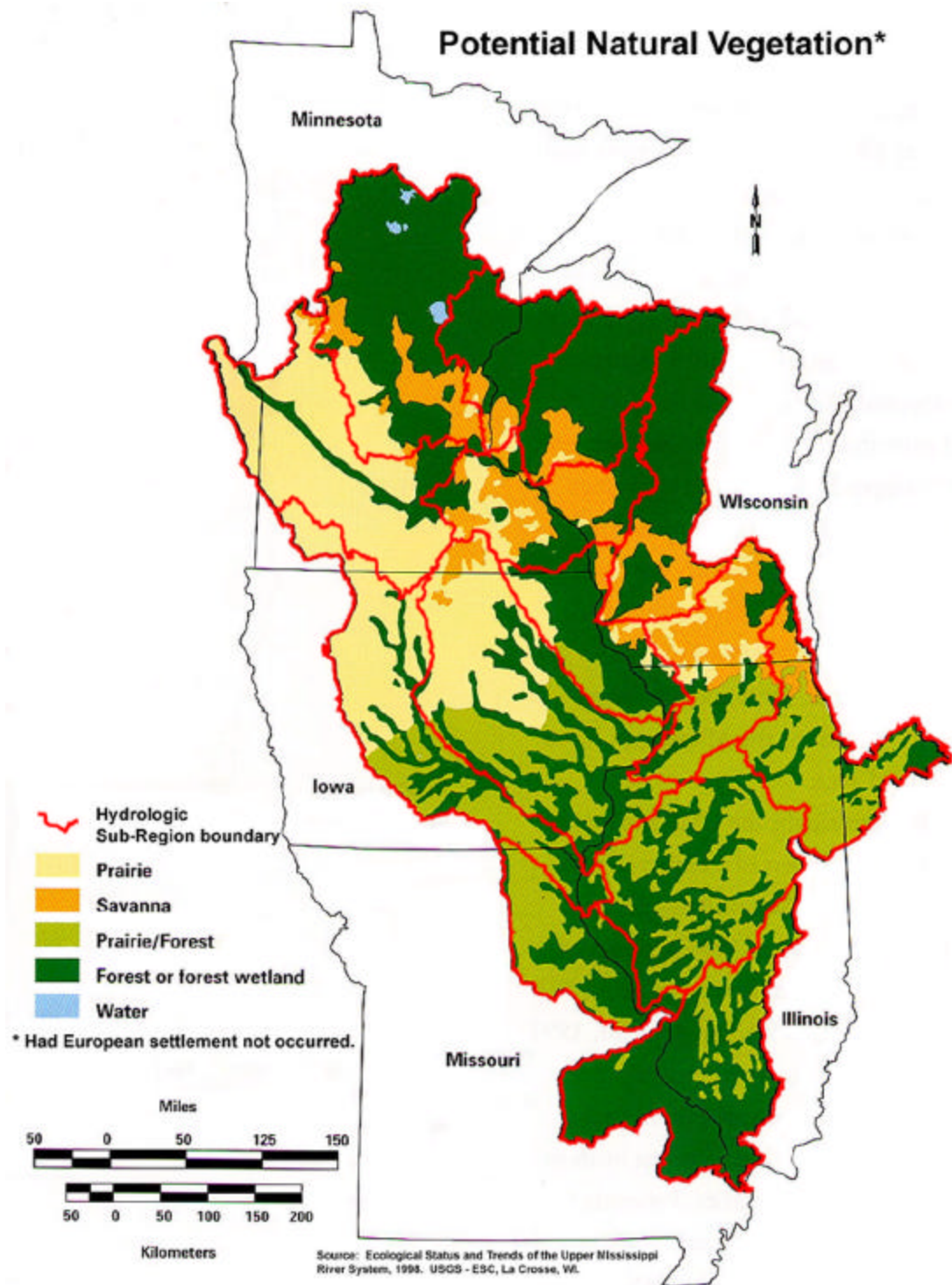


Figure 1: Potential Natural Vegetation.

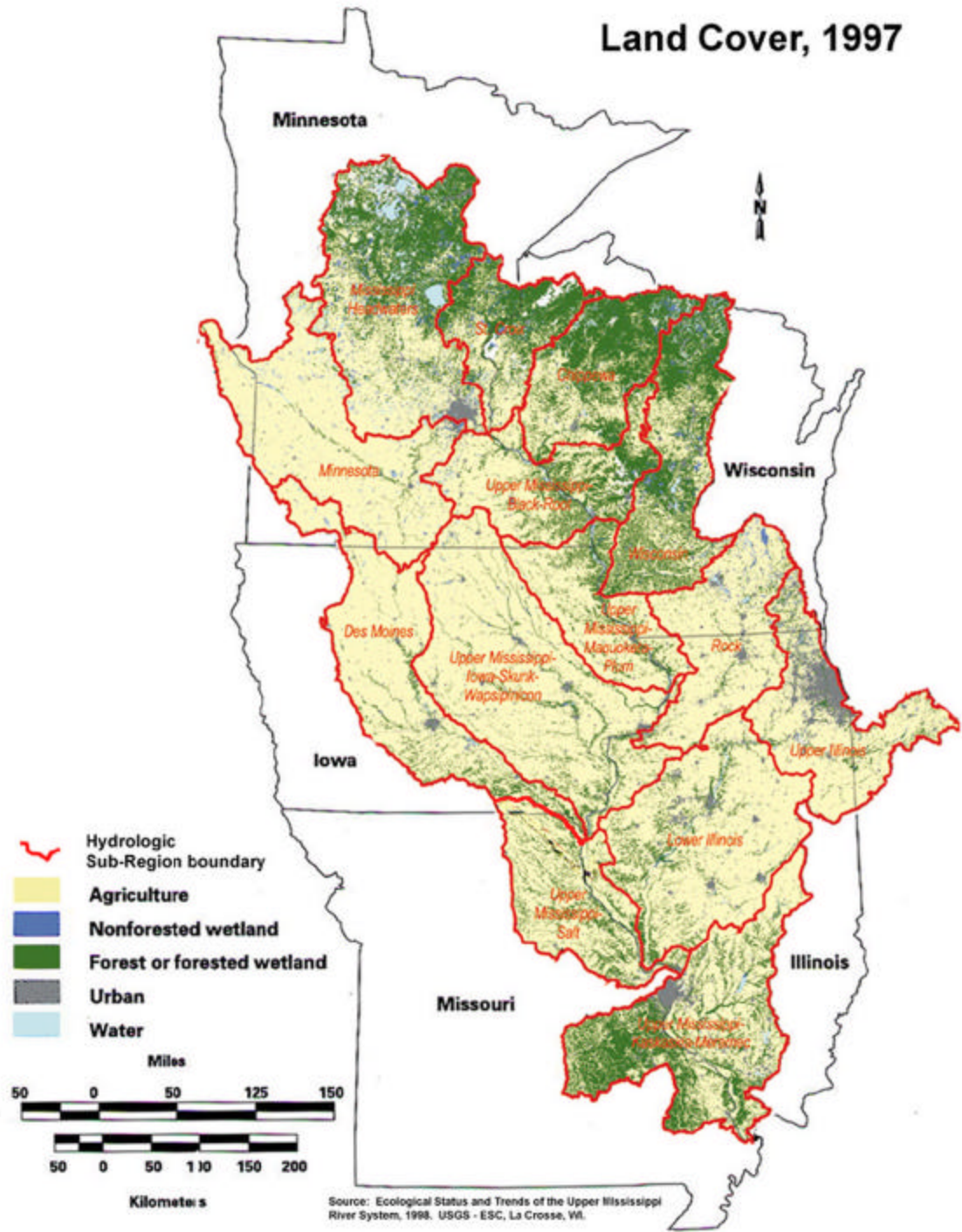


Figure 2: Land Cover in the UMR Basin, 1997.

Report Purpose and Organization

Purpose

The conversion of over 95% of the UMR basin's original native prairies, savannas and prairie/forests to agricultural land use has several major implications. The health and sustainability of the remaining natural areas within the basin, loss of biodiversity and ecosystem resiliency, and impacts to the Gulf of Mexico are a few of the unintended consequences of this conversion.

This report will focus on selected farming and farm practices; many related to farmland ownership. Land management practices that improve the environmental health and vitality of the UMR basin require the cooperation and participation of the individuals owning the land. Therefore, having a more complete understanding of farmland ownership and the identification of possible trends will be of great assistance in the design and delivery of agricultural policies and programs which support, rather than hinder, improvements to the environmental health of the UMR basin.

Secondly, this report is an attempt to present agricultural data that is normally collected and analyzed at the county level within the context of watersheds. Over the last decade, natural resource management at ecosystem and watershed levels has been emphasized as a means to address complex environmental issues and concerns within the UMR basin. Presenting data at the UMR sub-basin and watershed level will provide a level of information previously unavailable for watershed planning and management purposes.

Origins of UMR Basin Watershed Planning

The impetus for the preparation of this report began with a review of the Upper Mississippi River Comprehensive Basin Study, 1972 (UMRCBS). This landmark study has its roots in a resolution of the Committee on Public Works, U.S. Senate, 87th session in 1962. This study, along with other UMR sub-basin studies, was unique to the Upper Mississippi River basin. It was the first to call attention to planning and management for water resources on the basis of watersheds. Much of the data for the UMRCBS were organized around 16 planning areas that coincided with watershed delineations. These planning areas are noted on Figure 3: UMRCBS Planning Areas (following page).

It is worth noting that by the mid-to-late seventies a basin and watershed planning and management approach to dealing with water resource issues

began to fade from the attention of federal, state and local agencies. It would take nearly twenty years for the focus to be resurrected. The interest in addressing complex environmental issues from an ecosystem-based perspective has helped revive the importance of using basins and watersheds for organizing, planning and managing water resources.



Figure 3: UMR Comprehensive Basin Study Planning Area Designations

Organization

How the Data are Organized

In the UMR basin, county boundaries were primarily drawn to reflect the idiosyncrasies of the public land survey. As such, these boundaries inherently cause problems when addressing natural resource management issues and concerns. County boundaries make bad watershed boundaries.

As stated earlier one of the goals of this report is to provide data organized around watershed boundaries rather than county boundaries. Therefore, the numerous maps and tables included in this report present the Census of Agriculture county data on the basis of the 14 hydrologic sub-regions (i.e. sub-basins) and 131 hydrologic cataloging units as defined by the USGS. Map 1 outlines and names the 14 hydrologic sub-regions.

There are several naming conventions used to name the hydrologic units that make up the UMR basin. Figure 4 highlights these naming conventions. For the purposes of this report the entire Upper Mississippi River region is referred to as “the Basin”. The term “sub-basin” will be used to refer to a USGS defined sub-region for the purposes of this report.

Hydrologic Classification Naming Conventions		
USGS	USDA-NRCS	This Report
Region	----	Basin
Sub-region	----	Sub-basin
Accounting Unit	Basin	----
Cataloging Unit	Sub-basin	Watershed
----	Watershed	Sub-watershed
----	Sub-watershed	----

Figure 4. Classification Naming Conventions.

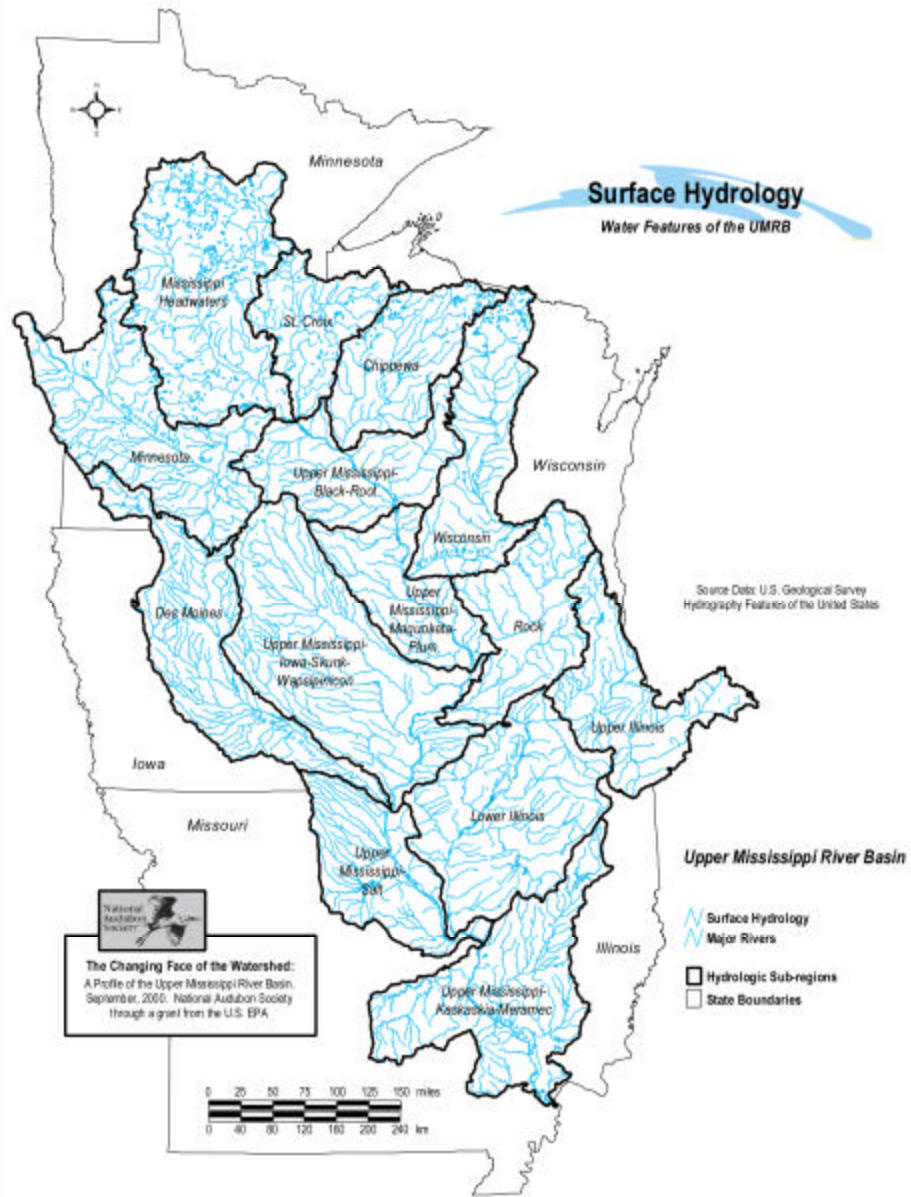
Acetate overlays of the 14 hydrologic sub-regions (sub-basins) and hydrologic cataloging units (watersheds) are provided to as aids to understanding the geographic context of the data presented. When placed over the county-based maps, these overlays will assist the reader in converting their intuitive and acquired knowledge of a particular locale or region into watershed terms.

Definitions of the USGS hydrologic classification scheme are outlined in Appendix B. A map of the UMR basin that geographically identifies the USGS hydrologic cataloging classification numbers is part of Appendix D. Appendix E provides the corresponding names for each cataloging unit

based on the corresponding classification number identified on the Appendix D map.

Primary Data Sources

The primary data source used in this report is the U.S. Department of Agriculture (USDA) Census of Agriculture. This Census has generally



Map 1: Fourteen UMR Sub-Basins (USGS hydrologic sub-regions)

been conducted every 5 years. It is currently conducted by the USDA. Census for the years 1987, 1992, and 1997 are heavily relied upon in the preparation of this report. Census data is collected, analyzed and reported on a county-by-county basis.

Appendix C contains information on the geographic data files and sources.

UMRCBS Watersheds and the 14 Sub-Basins in this Report

As noted earlier, the origins for UMR basin watershed planning and management has its roots in the 1972 Upper Mississippi River Comprehensive Basin Study (UMRCBS). The 16 planning areas of the UMRCBS were delineated on the basis of a watershed classification scheme.

For this report a decision was made early in the analysis to organize the data on the basis of the 14 USGS sub-regions (sub-basins) and 131 hydrologic cataloging units for the UMR basin. The decision to use this classification scheme was based largely on the fact that these are nationally recognized watershed delineations. They are also being adopted by other federal agencies (e.g. US EPA, USDA NRCS) and some states as the organizing methodology for collecting and reporting land and water resources related data. Using this classification scheme for watershed delineation will give the data in this report additional utility when considering other UMR basin environmental management issues not covered here.

Calculating UMR Hydrologic Cataloging Unit Information from County Level Data

Agricultural data for this report originated from various reporting years of the USDA Census of Agriculture, which reports its data by *county*. A major goal of this report, however, is to present such information at various *watershed* levels. In order to evaluate agricultural practices by watershed areas, two methods of assessing the data are utilized, both involving the use of a geographic information system (GIS).

One of the procedures involved *areal interpolation*. This procedure utilizes GIS and spreadsheet software to produce mathematical estimates of attribute data values for USGS hydrologic cataloging units, based on data that were originally collected over the same geographic area (i.e., the UMR basin) at the county level. Further technical detail on areal interpolation is included in Appendix A.

Cautions in Interpretation

Data reported at the *county* level represents official USDA counts and estimates as determined from the sampling surveys analyzed for each Agriculture Census year. It should be noted that this county data is only as accurate as the original county survey data.

While areal interpolation method does not produce *exact* values for watershed-level data, the process results in numbers that closely approximate actual values in a non-arbitrary manner. It should not be forgotten that agricultural data reported by hydrologic unit in this document are strictly mathematical estimates of actual county-level values and should be treated accordingly.

Simply put, this report is best used to assess whether generally held perceptions of agricultural land use conditions within the sub-regions are within reason, whether current watershed management actions are in concert with current trends, and whether additional information should be collected or research conducted to support better management decision-making.

Additional Sources of Information

A vast array of information is available over the Internet. Numerous websites offer a great deal of background concerning water quality, urban sprawl, land use, trends in agriculture, and the like. Much of this information is in map and/or graphic format and was not duplicated for this report since it is so readily available.

These websites are also excellent sources of information for further understanding the complex resource management issues and concerns of the UMR basin. Information is presented at numerous spatial scales allowing for greater utility in resource planning and management.

The following table (Table 3) identifies the URL for each website and provides a brief description of the utility of the information contained therein. Readers of this report are strongly encouraged to visit these websites for a broader and more complete understanding of the current issues and concerns.

A Word about Urban Land Use

This report does not elaborate on issues related to urban land development, urban storm-water management, and sewage treatment issues. This is

NOT to diminish the importance of attending to water quality and land management issues within urban areas

Urban land uses can and do have the potential to seriously degrade water quality. Suburban homeowners frequently over-fertilize lawn areas. Early studies indicate that suburban lawn areas receive up to 10 times the recommended application rate of nitrogen. Herbicide is frequently used to control obnoxious weeds. Phosphorus run-off from suburban lawns has been shown to cause excessive algae blooms in downstream ponds and lakes.

Much data has been collected regarding urban land use and water quality impacts. To provide a more complete picture of the overall condition of the UMR basin landscape, an urban land use study could be undertaken as a companion report.

The information presented here is merely a reminder that we are all in this together. Whether we are a small farmer, a large farm operator, a suburban landowner, or an industrial facility owner, we all are responsible for taking the time and expense to be proper stewards of the land. Such actions are necessary to assure not only our own future, but also that of future generations who are relying upon us to leave an environmental legacy that speaks to our respect for our land- and water resources and ourselves.

Table 3: Useful Information Available over the Internet

Web Site Address and Site Sponsor	Featured Information
www.nrcs.usda.gov USDA Natural Resource Conservation Service	Extensive information on land use and conservation related issues, main home page
www.nhq.nrcs.usda.gov/land/home.html USDA Natural Resource Conservation Service	Location for the State of the Land, 1997 Natural Resources Inventory; extensive land use and environmental information (much data based on watersheds); includes info on urban land use
www.govinfo.kerr.orst.edu/govdoc/govinfo.htm Oregon State University	Census of Agriculture, 1997, 1992 on-line and easily accessible; great deal of US government info for ag, environmental issues, demographics, economics.

www.nal.usda.gov USDA National Agricultural Library	Source for international and national ag related info; parent site of AgNIC
www.usda.gov/nass USDA National Agricultural Statistics Services	Extensive information on agricultural crop production, ag land ownership, farm size etc. (data used in this report)
www.agnic.org Agriculture Network Information Center	Agriculture, ag economics, plant and animal sciences, farming and farming systems, technology, regulations and law.
www.ers.usda.gov USDA Economic Research Service	Related research and info on agriculture and economics, food production, ag production outlooks, etc.
www.epa.gov/surf US Environmental Protection Agency	Premier site for data at the watershed level (USGS hydrologic cataloging units); extensive water quality and land use related info
www.epa.gov/msbasin/msrhp.html US Environmental Protection Agency	Site specifically devoted to the UMR basin: maps, etc.; hypoxia info; organizations working in the basin
www.umesc.usgs.gov/ Upper Midwest Environmental Sciences Center	Extensive environmental information on the UMR basin and Upper Mississippi River corridor
www.memory.loc.gov/ammem/amhome.html US Library of Congress	Collections of historical info and event timelines in American history
www.memory.loc.gov/ammem/amrvhtml/conshome.html US Library of Congress	Evolution of the Conservation Movement
www.biology.usgs.gov/luhna/ USGS	Site for overview information on the history of land use in North American; great info on agriculture and urbanization
www.water.usgs.gov USGS	Extensive databases or related GIS information for organizing and managing data geographically; includes datasets for the watershed classification scheme used in this report
www.nationalatlas.gov US Department of the Interior	National atlas of the US; map-like views of America's natural and socio-cultural landscapes

www.census.gov US Department of Commerce	Repository site for national, decennial census and related info
www.usda.mannlib.cornell.edu Cornell University, Mann Library	USDA Economics and Statistics Systems; many links to ag related databases and information, specifically USDA collected information
www.ohioline.ag.ohio-state.edu/b871/index.html Ohio State University	Premier site for information related to agricultural land drainage issues, current trends, potential water quality impacts and related topics (recommended viewing/reading for anyone concerned with ag land drainage)
www.iatp.org Institute for Agriculture and Trade Policy	Farm policy, environment and ag issues, food and ag, forestry
www.farmland.org American Farmland Trust	Sprawl issues, farm policy, environmental issues related to ag
www.1000friendsofwisconsin.com 1000 Friends of Wisconsin	Urban sprawl issues, farm consolidation, family farms
www.kfoi.org 1000 Friends of Iowa	Urban sprawl, family farms and farming
www.1000fom.org 1000 Friends of Minnesota	Urban sprawl, farmland consolidation, farm policy, land conservation
www.sprawlwatch.org Sprawl Watch Clearinghouse	Urban sprawl, smart growth concepts
www.smartgrowth.org/ Smart Growth Network	Promotion of smart growth land planning and management in urban areas
www.outreach.missouri.edu/mowin/ University of Missouri	Data, information, programs for watershed planning and management
www.mrbdc.mankato.msus.edu/ Minnesota State University	Clearinghouse and data center for data and information related to the Minnesota River Basin
www.pca.state.mn.us/water/basins Minnesota Pollution Control Agency	Watershed related information for Minnesota river basins
www.missriver.umn.edu/links.html University of Minnesota	Many links to agencies, organizations, and groups working in the Mississippi River Basin concerning environmental issues, recreation, economic development

Note: All URL addresses, although NOT noted in the table begin with: http://

Upper Mississippi River Basin Map Series

The following map series begins with population density and urban areas and roads. These maps help put population centers into a geographic context.

The remaining maps on farmland and farmland ownership patterns present data on a county and an USGS hydrologic cataloging unit basis. County level maps are included for readers more familiar with data reporting on a county basis. Data reported on a hydrologic cataloging unit basis are meant to give insight into how the same county-level data can be displayed within a watershed context (see appendix A for a complete technical explanation of the process used).

The reader is encouraged to challenge previously held notions of farmland ownership and to analyze the implications for agricultural policies and programs that are meant to improve the environmental quality within the UMR basin. To assist the reader in this process, an interpretation and implication sheet is included with each county-level and hydrologic cataloging unit-level map grouping.

Complete and thorough terminology definitions, data descriptions, data collection and analysis techniques, and other background information can be easily downloaded from the U.S. Department of Agriculture website at www.nass.usda.gov/census.



Minnesota

Population Density

Persons Per Square Mile, 1999

Wisconsin

Source Data: US Department of Commerce,
US Census Bureau 1999 Population Estimates

Iowa

Missouri

Illinois



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September, 2000. National Audubon Society
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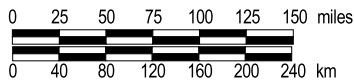
Upper Mississippi River Basin

Persons Per Sq Mile (by County)

- 5 - 145 persons
- 146 - 409 persons
- 410 - 1379 persons
- 1380 - 3745 persons
- 3746 - 5489 persons

Classification by Natural Breaks

 Hydrologic Sub-regions

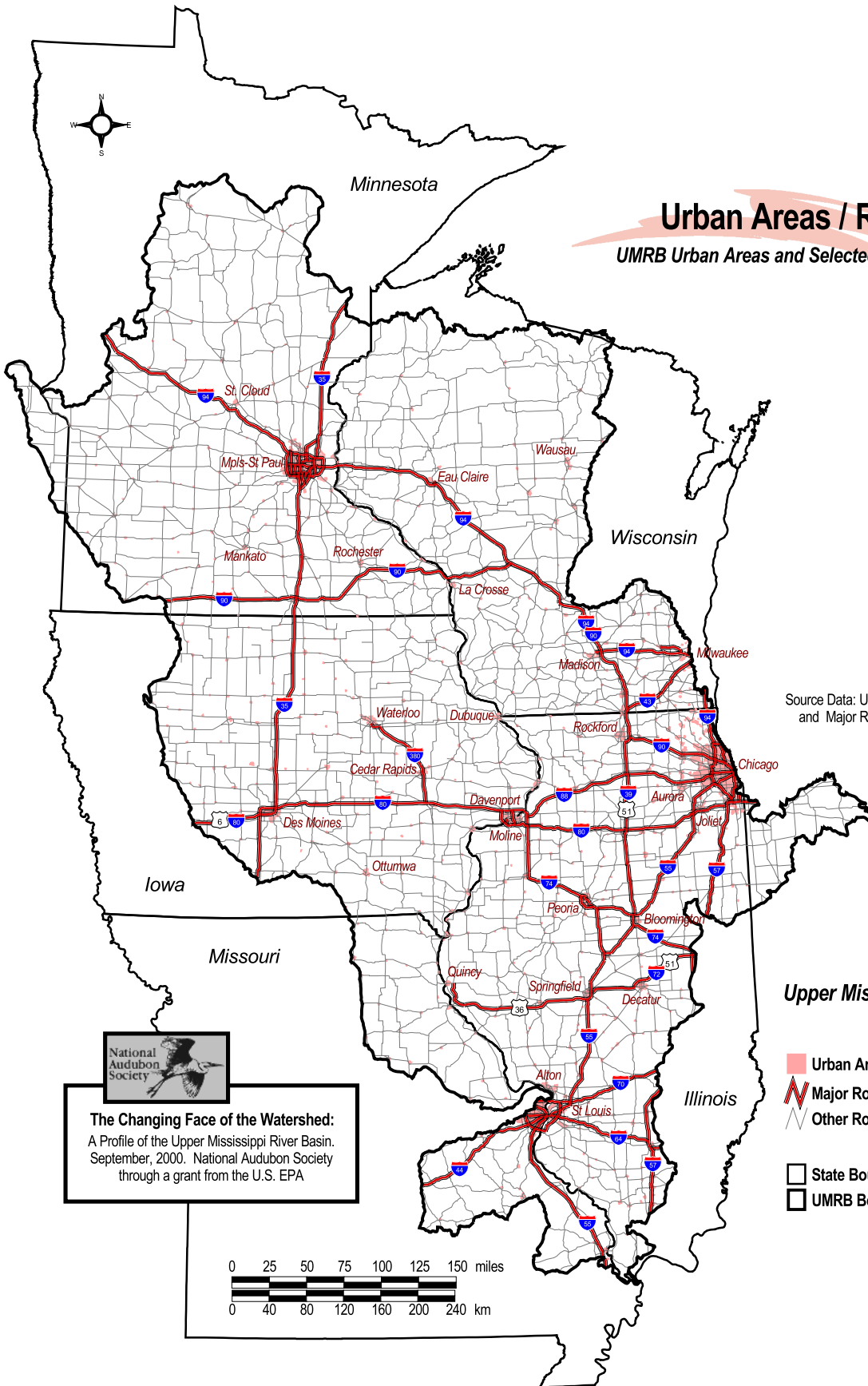




Minnesota

Urban Areas / Roads

UMRB Urban Areas and Selected Major Roads



Source Data: USGS Urban Areas of the U.S. and Major Roads and Trails of the U.S.

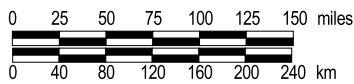
Upper Mississippi River Basin

- Urban Areas
- Major Roads
- Other Roads

- State Boundaries
- UMRB Boundary



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Minnesota

Land In Farms

Percentage of Total Land Area in Farms
by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois

Upper Mississippi River Basin



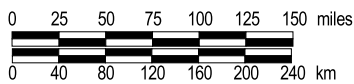
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Pct of Land Area (by County)

- 0 - 27 %
- 28 - 53 %
- 54 - 70 %
- 71 - 83 %
- 84 - 100 %

Classification by Natural Breaks

 Hydrologic Sub-regions





Minnesota

Land In Farms

Percentage of Total Land Area in Farms
by USGS Hydrologic Cataloging Unit, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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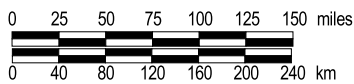
Upper Mississippi River Basin

Percentage of Land Area (by Hydrologic Cataloging Unit)

- 0 - 27 %
- 28 - 53 %
- 54 - 70 %
- 71 - 83 %
- 84 - 100 %

Classes correspond with county-level map
of same title (at left)

 Hydrologic Sub-regions





Minnesota

Farm Size

Mean Farm Size by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois

Upper Mississippi River Basin



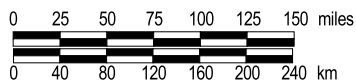
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Mean Farm Size (by County)

- 0 - 213 acres
- 214 - 303 acres
- 304 - 398 acres
- 399 - 572 acres
- 573 - 1030 acres

Classification by Natural Breaks

 Hydrologic Sub-regions





Minnesota

Farm Density

Farms Per Square Mile, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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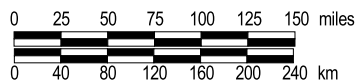
Upper Mississippi River Basin

Farms Per Sq Mile (by County)

- 0 - 0.5 farms
- 0.5 - 1 farms
- 1 - 1.4 farms
- 1.4 - 1.8 farms
- 1.8 - 2.8 farms

Classification by Natural Breaks

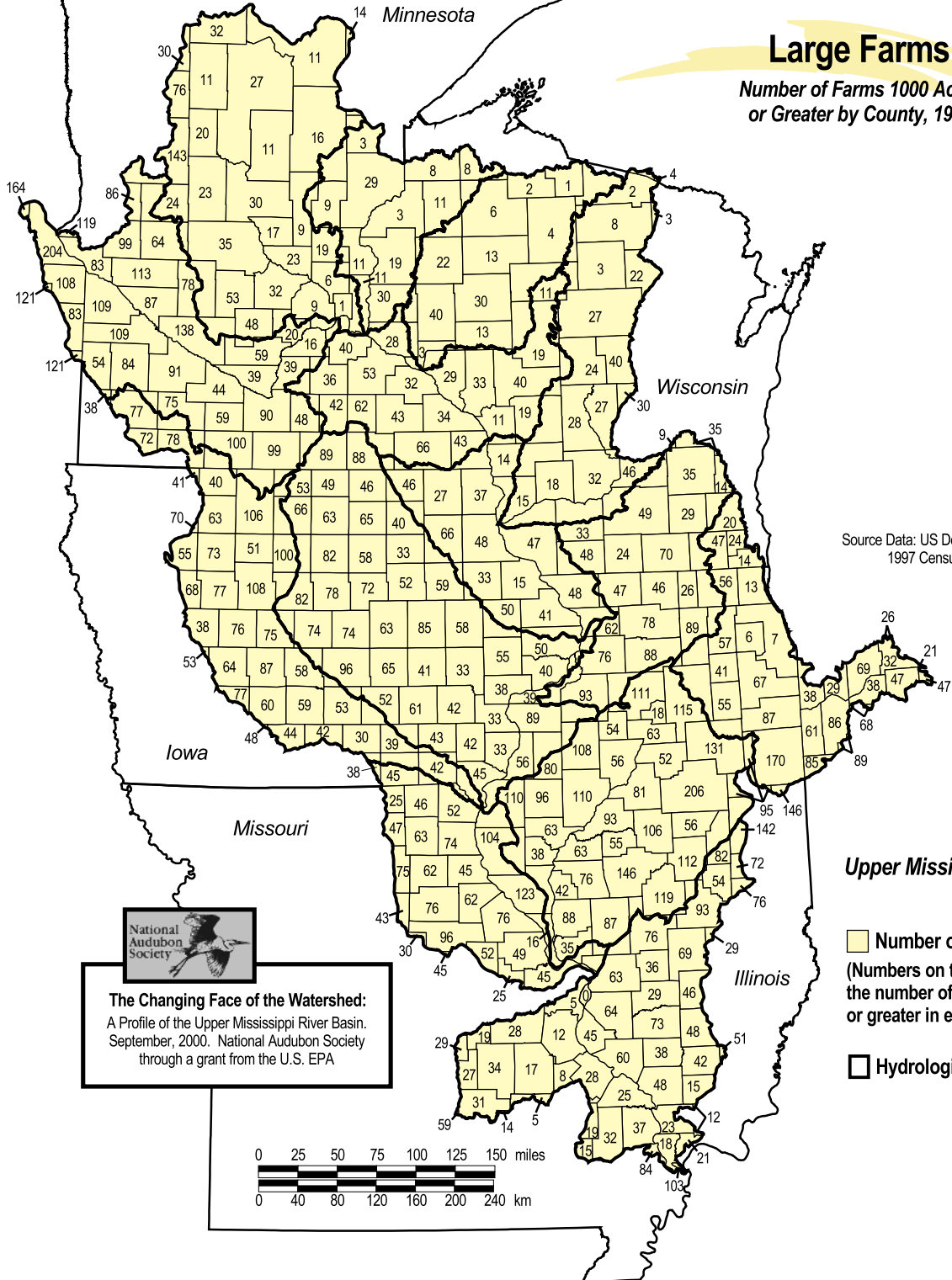
 Hydrologic Sub-regions





Large Farms

Number of Farms 1000 Acres or Greater by County, 1997



Source Data: US Department of Agriculture
1997 Census of Agriculture

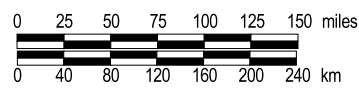
Upper Mississippi River Basin

Number of Farms (by County)
(Numbers on the map represent the number of farms 1000 acres or greater in each county)

Hydrologic Sub-regions



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Minnesota

Large Farms

Percentage of Farms 1000 Acres or Greater by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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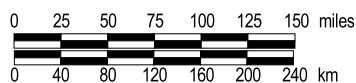
Upper Mississippi River Basin

Percentage of Farms (by County)

- 0 - 3 %
- 4 - 7 %
- 8 - 12 %
- 13 - 20 %
- 21 - 39 %

Classification by Natural Breaks

 Hydrologic Sub-regions





Minnesota

Farmland Consolidation

Percentage of Total Farmland
in Farms of 1000 or More Acres
by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois




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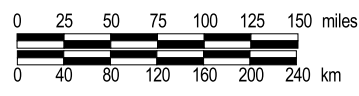
Upper Mississippi River Basin

Pct of Farmland (by County)

- 0 - 15 %
- 16 - 27 %
- 28 - 38 %
- 39 - 51 %
- 52 - 74 %

Classification by Natural Breaks

 Hydrologic Sub-regions





Minnesota

Farmland Consolidation

Percentage of Total Farmland
in Farms of 1000 or More Acres
by USGS Hydrologic Cataloging Unit, 1997

Wisconsin

Iowa

Missouri

Illinois

Source Data: US Department of Agriculture
1997 Census of Agriculture

Upper Mississippi River Basin



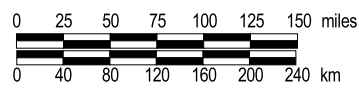
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Percentage of Area (by Hydrologic Cataloging Unit)

- 0 - 15 %
- 16 - 27 %
- 28 - 38 %
- 39 - 51 %
- 52 - 74 %

Classes correspond with county-level map
of same title (at left)

Hydrologic Sub-regions





Minnesota

Fertilizer Application

Percentage of Total Land Area
on which Commercial Fertilizer was Applied
by County, 1954

Wisconsin

Source Data: US Department of Agriculture
1954 Census of Agriculture

Iowa

Missouri

Illinois

Upper Mississippi River Basin



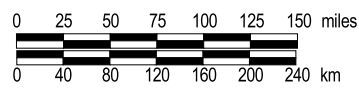
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Pct of Land Area (by County)

- 0 - 13 %
- 14 - 26 %
- 27 - 40 %
- 41 - 53 %
- 54 - 67 %

Classification by Equal Interval

 Hydrologic Sub-regions





Minnesota

Fertilizer Application

Percentage of Total Land Area on which Commercial Fertilizer was Applied by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois

Upper Mississippi River Basin



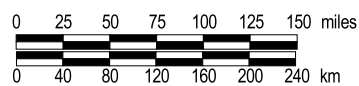
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Pct of Land Area (by County)

- 0 - 13 %
- 14 - 26 %
- 27 - 40 %
- 41 - 53 %
- 54 - 67 %

Classification by Equal Interval

Hydrologic Sub-regions





Minnesota

Fertilizer Application

Percentage of Total Land Area
on which Commercial Fertilizer was Applied
by USGS Hydrologic Cataloging Unit, 1954

Wisconsin

Source Data: US Department of Agriculture
1954 Census of Agriculture

Iowa

Missouri

Illinois



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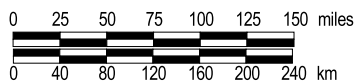
Upper Mississippi River Basin

**Percentage of Land Area
(by Hydrologic Cataloging Unit)**

- 0 - 13 %
- 14 - 26 %
- 27 - 40 %
- 41 - 53 %
- 54 - 67 %

Classes correspond with county-level maps
of same title (previous pages)

 Hydrologic Sub-regions





Minnesota

Fertilizer Application

Percentage of Total Land Area
on which Commercial Fertilizer was Applied
by USGS Hydrologic Cataloging Unit, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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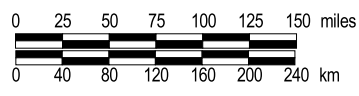
Upper Mississippi River Basin

Percentage of Land Area (by Hydrologic Cataloging Unit)

- 0 - 13 %
- 14 - 26 %
- 27 - 40 %
- 41 - 53 %
- 54 - 67 %

Classes correspond with county-level maps
of same title (previous pages)

Hydrologic Sub-regions





Minnesota

Herbicide Use

Percentage of Total Land Area
on which Herbicide was Applied
by County, 1964

Wisconsin

Source Data: US Department of Agriculture
1964 Census of Agriculture

Iowa

Missouri

Illinois

Upper Mississippi River Basin



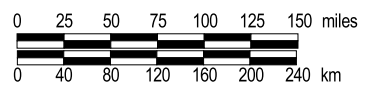
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Pct of Land Area (by County)

- 0 - 15 %
- 16 - 31 %
- 32 - 47 %
- 48 - 63 %
- 64 - 79 %

Classification by Equal Interval

 Hydrologic Sub-regions





Minnesota

Herbicide Use

Percentage of Total Land Area
on which Herbicide was Applied
by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Upper Mississippi River Basin



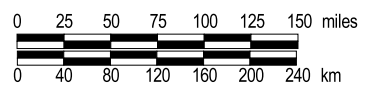
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Pct of Land Area (by County)

- 0 - 15 %
- 16 - 31 %
- 32 - 47 %
- 48 - 63 %
- 64 - 79 %

Classification by Equal Interval

Hydrologic Sub-regions



Illinois



Minnesota

Herbicide Use

Percentage of Total Land Area on which Herbicide was Applied by USGS Hydrologic Cataloging Unit, 1964

Wisconsin

Source Data: US Department of Agriculture
1964 Census of Agriculture

Iowa

Missouri

Illinois



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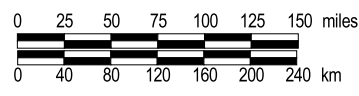
Upper Mississippi River Basin

Percentage of Land Area (by Hydrologic Cataloging Unit)

- 0 - 15 %
- 16 - 31 %
- 32 - 47 %
- 48 - 63 %
- 64 - 79 %

Classes correspond with county-level maps of same title (previous pages)

Hydrologic Sub-regions





Minnesota

Herbicide Use

Percentage of Total Land Area
on which Herbicide was Applied
by USGS Hydrologic Cataloging Unit, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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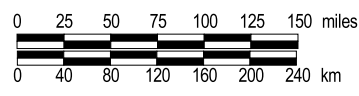
Upper Mississippi River Basin

Percentage of Land Area (by Hydrologic Cataloging Unit)

- 0 - 15 %
- 16 - 31 %
- 32 - 47 %
- 48 - 63 %
- 64 - 79 %

Classes correspond with county-level maps
of same title (previous pages)

Hydrologic Sub-regions





Minnesota

CRP/WRP Participation

Percentage of Farms Enrolled
in the Conservation Reserve Program
or Wetlands Reserve Program, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois

Upper Mississippi River Basin



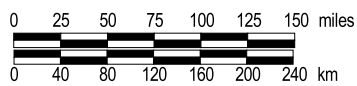
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Percentage of Farms (by County)

- 0 - 8 %
- 9 - 16 %
- 17 - 25 %
- 26 - 35 %
- 36 - 49 %

Classification by Natural Breaks

Hydrologic Sub-regions





Minnesota

CRP/WRP Participation

Percentage of Farms Enrolled
in the Conservation Reserve Program
or Wetlands Reserve Program, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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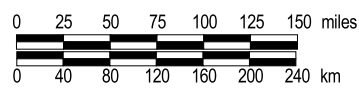
Upper Mississippi River Basin

Percentage of Farms
(by Hydrologic Cataloging Unit)

- 0 - 8 %
- 9 - 16 %
- 17 - 25 %
- 26 - 35 %
- 36 - 49 %

Classes correspond with county-level map
of same title (at left)

Hydrologic Sub-regions





Minnesota

Family Corporate Farms

Percentage of Farmland
under Family Corporate Ownership
by County, 1987

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



The Changing Face of the Watershed:
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Upper Mississippi River Basin

Percentage of Farmland (by County)

- 0 - 4 %
- 5 - 9 %
- 10 - 15 %
- 16 - 23 %
- 24 - 42 %

Classes correspond with 1997 county-level
map of the same title (at right)

Hydrologic Sub-regions

0 25 50 75 100 125 150 miles

0 40 80 120 160 200 240 km



Minnesota

Family Corporate Farms

Percentage of Farmland
under Family Corporate Ownership
by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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Upper Mississippi River Basin

Percentage of Farmland (by County)

- 0 - 4 %
- 5 - 9 %
- 10 - 15 %
- 16 - 23 %
- 24 - 42 %

Classification by Natural Breaks

 Hydrologic Sub-regions

0 25 50 75 100 125 150 miles

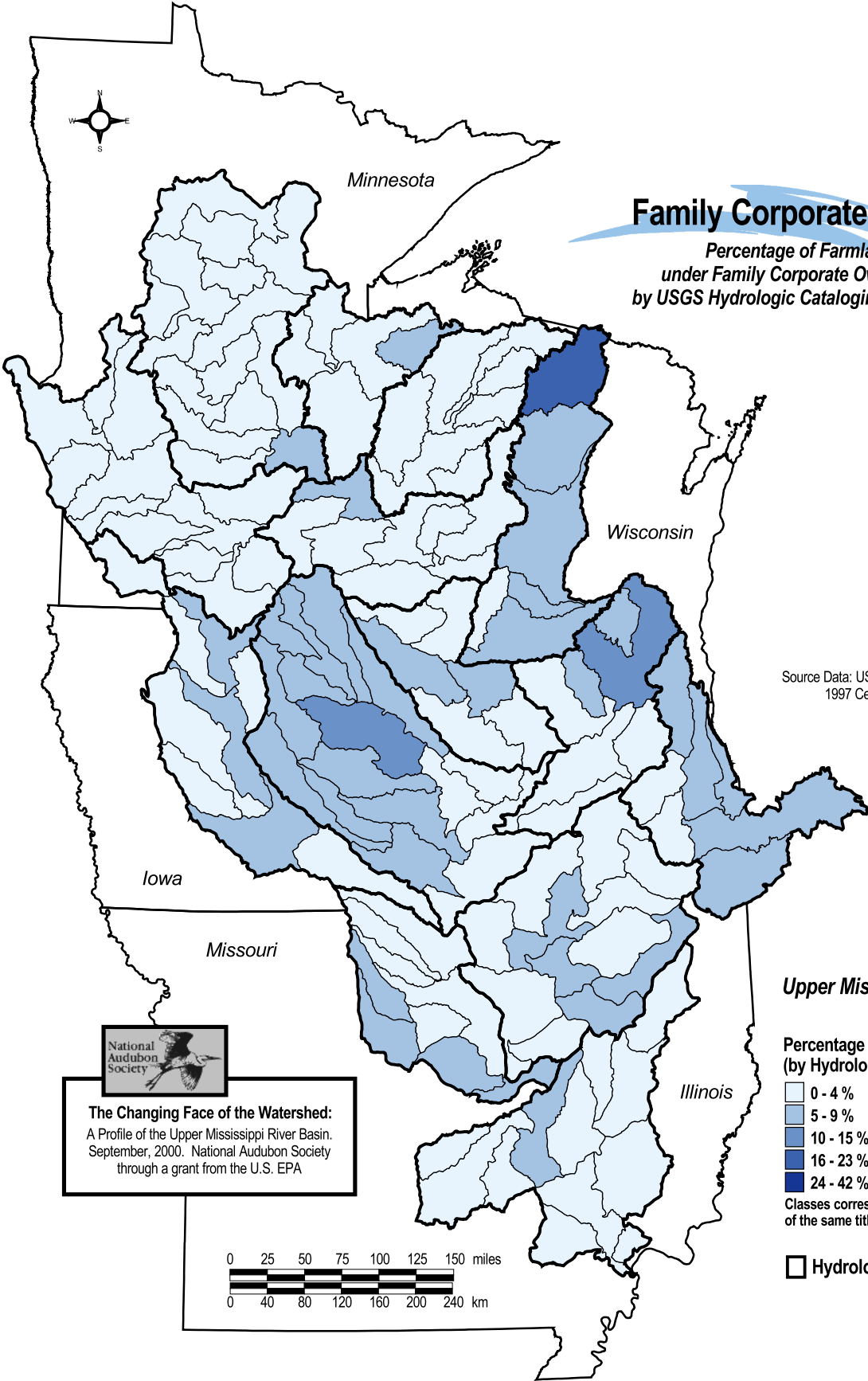
0 40 80 120 160 200 240 km



Minnesota

Family Corporate Farms

Percentage of Farmland
under Family Corporate Ownership
by USGS Hydrologic Cataloging Unit, 1987



Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois

Upper Mississippi River Basin

Percentage of Farmland
(by Hydrologic Cataloging Units)

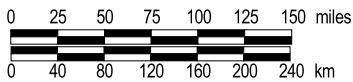
- 0 - 4 %
- 5 - 9 %
- 10 - 15 %
- 16 - 23 %
- 24 - 42 %

Classes correspond with 1997 map
of the same title (at right)

Hydrologic Sub-regions



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Minnesota

Family Corporate Farms

Percentage of Farmland
under Family Corporate Ownership
by USGS Hydrologic Cataloging Unit, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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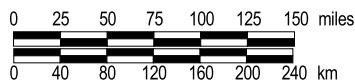
Upper Mississippi River Basin

Percentage of Farmland
(by Hydrologic Cataloging Units)

- 0 - 4 %
- 5 - 9 %
- 10 - 15 %
- 16 - 23 %
- 24 - 42 %

Classification by Natural Breaks

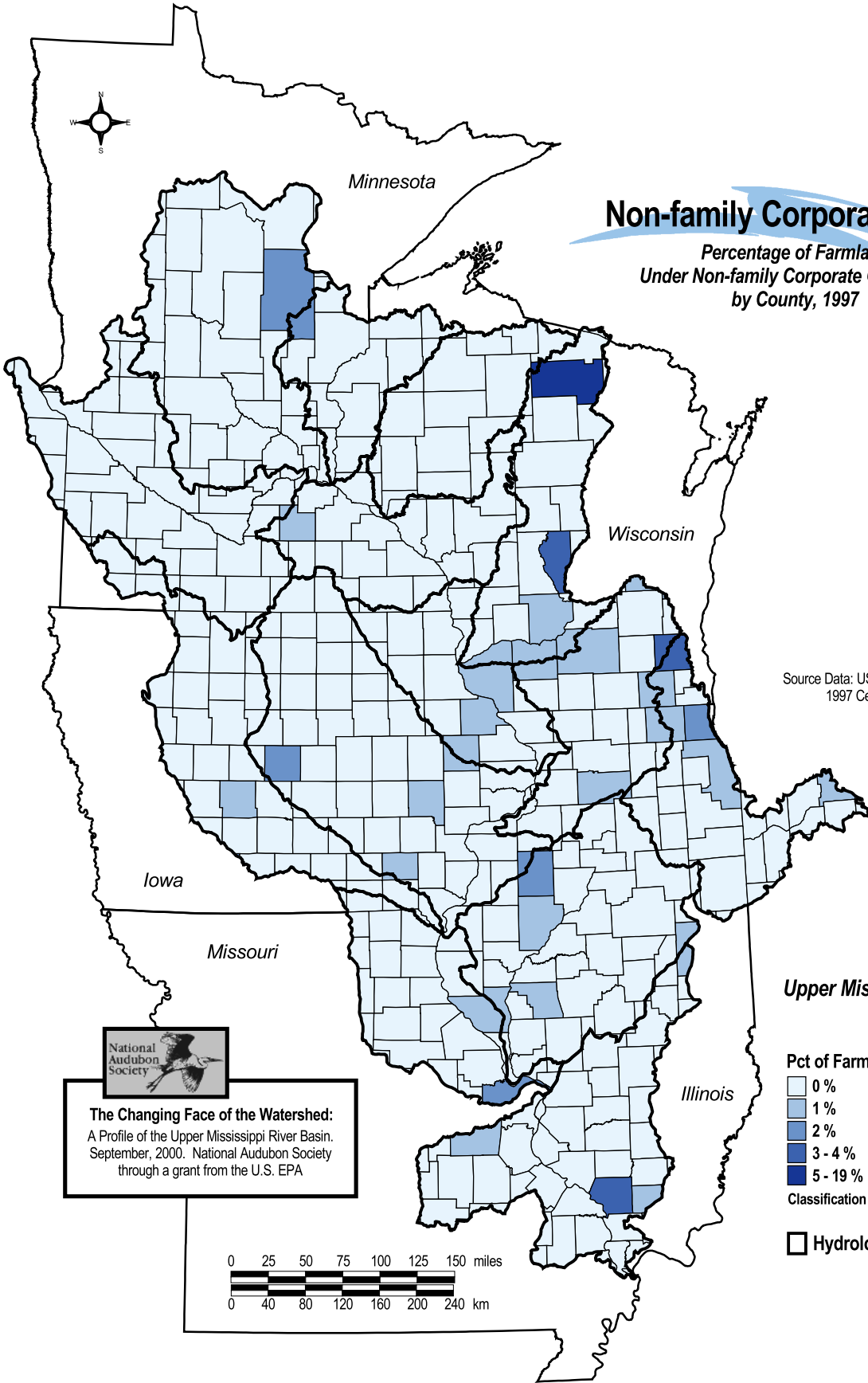
 Hydrologic Sub-regions





Non-family Corporate Farms

Percentage of Farmland Under Non-family Corporate Ownership by County, 1997



Source Data: US Department of Agriculture
1997 Census of Agriculture

Upper Mississippi River Basin



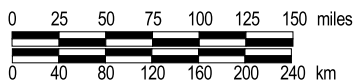
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Pct of Farmland (by County)

- 0 %
- 1 %
- 2 %
- 3 - 4 %
- 5 - 19 %

Classification by Natural Breaks

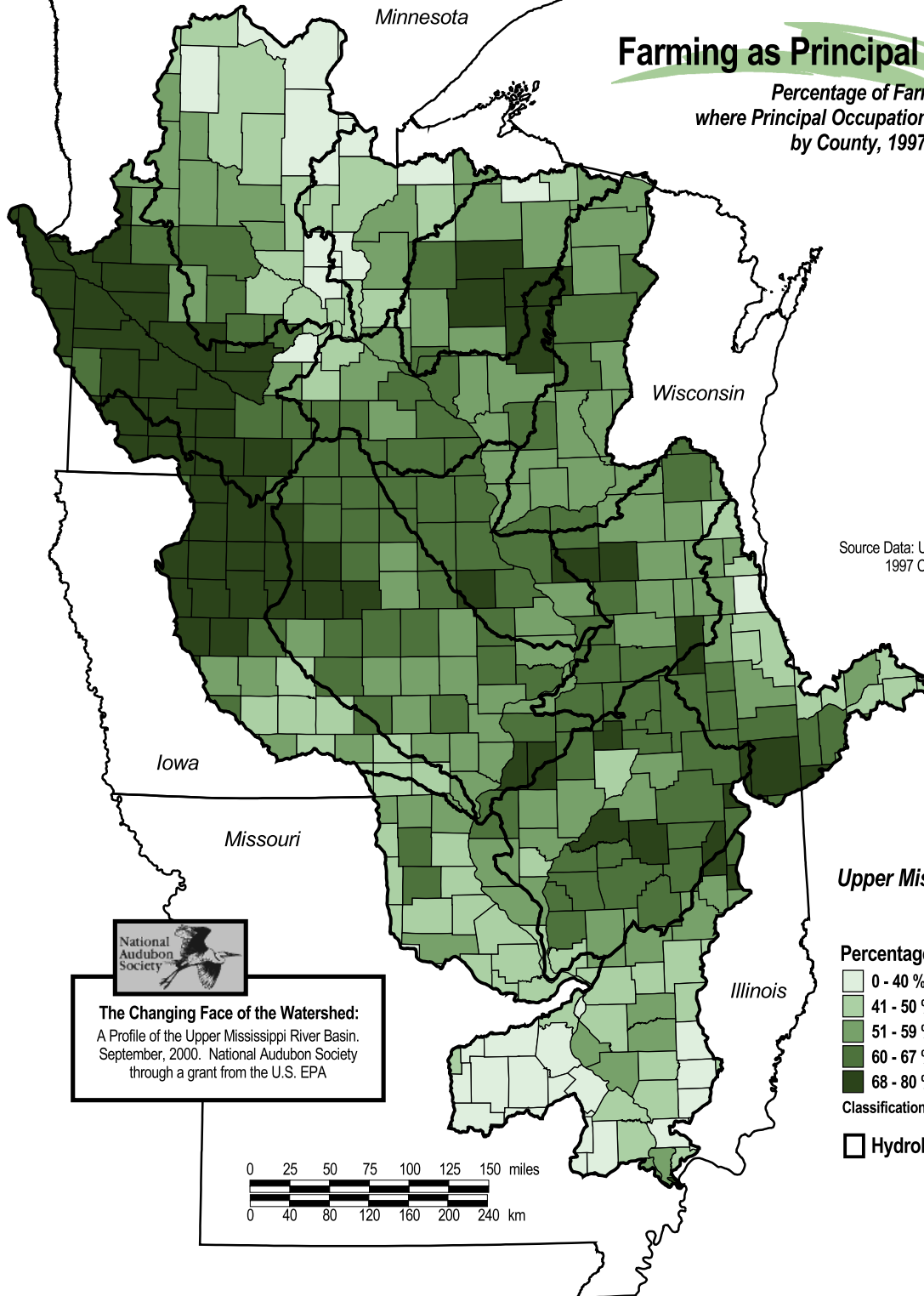
Hydrologic Sub-regions





Farming as Principal Occupation

Percentage of Farms
where Principal Occupation is Farming
by County, 1997



Source Data: US Department of Agriculture
1997 Census of Agriculture

Upper Mississippi River Basin

Percentage of Farms (by County)

- 0 - 40 %
- 41 - 50 %
- 51 - 59 %
- 60 - 67 %
- 68 - 80 %

Classification by Natural Breaks

 Hydrologic Sub-regions



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Minnesota

Farmers Age 65 and Older

Percentage of Farms in which Age of Operator is 65 Years or Greater by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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Upper Mississippi River Basin

Percentage of Farms (by County)

- 0 - 18 %
- 19 - 22 %
- 23 - 26 %
- 27 - 30 %
- 31 - 39 %

Classification by Natural Breaks

 Hydrologic Sub-regions

0 25 50 75 100 125 150 miles

0 40 80 120 160 200 240 km



Minnesota

Farmers Age 65 and Older

Percentage of Farms in which
Age of Operator is 65 Years or Greater
by USGS Hydrologic Cataloging Unit, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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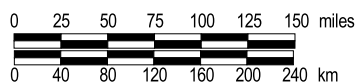
Upper Mississippi River Basin

Percentage of Farms (by Hydrologic Cataloging Unit)

- 0 - 18 %
- 19 - 22 %
- 23 - 26 %
- 27 - 30 %
- 31 - 39 %

Classes correspond with county-level map
of same title (at left)

 Hydrologic Sub-regions





Minnesota

Swine Density

Number of Hogs and Pigs Per Square Mile
by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



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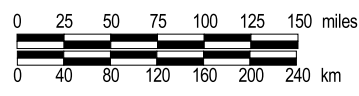
Upper Mississippi River Basin

Pigs Per Square Mile (by County)

- 0 - 45 pigs
- 46 - 127 pigs
- 128 - 249 pigs
- 250 - 483 pigs
- 484 - 777 pigs

Classification by Natural Breaks

 Hydrologic Sub-regions





Minnesota

Turkey Density

Number of Turkeys Per Square Mile
by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois

Upper Mississippi River Basin



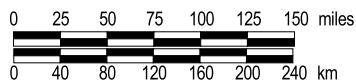
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Turkeys Per Sq Mile (by County)

- 0 - 57 turkeys
- 58 - 183 turkeys
- 184 - 571 turkeys
- 572 - 1135 turkeys
- 1136 - 3479 turkeys

Classification by Natural Breaks

Hydrologic Sub-regions





Minnesota

Poultry Density

Number of Chickens Per Square Mile
by County, 1997

Wisconsin

Source Data: US Department of Agriculture
1997 Census of Agriculture

Iowa

Missouri

Illinois



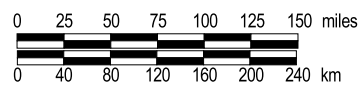
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Upper Mississippi River Basin

Chickens Per Sq Mile (by County)

- 0 - 78 chickens
 - 79 - 335 chickens
 - 336 - 703 chickens
 - 704 - 2819 chickens
 - 2820 - 4859 chickens
- Classification by Natural Breaks

Hydrologic Sub-regions



Tabular Data for the Upper Mississippi River Basin and 14 Sub-Basins

The preceding maps present an excellent, graphic overview of the patterns and trends in agricultural land use across the UMR basin. However, additional insight can be ascertained by reviewing the numeric data. The tabular data that follows has been organized on the basis of the 14 UMR hydrologic sub-regions (sub-basins) and of the UMR basin as a whole. The numeric data presented in the tables are aggregated from the data used to generate the watershed-level (hydrologic cataloging unit) maps.

Table 4: Upper Mississippi River Basin Characteristics
(USGS Hydrologic Region Designator Number: 07)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	118,401,517	118,401,517	118,401,517
Land Area in Farms (acres)	83,421,291	80,402,072	79,912,926
Total Land Area*: Percent in Farms	70	67	67
Total Cropland (acres)	68,055,759	66,254,863	65,286,425
Total Woodland (acres)	7,630,515	7,019,903	7,121,316
Total Other Land (acres)	7,735,071	7,133,557	7,502,410
Land in CRP and WRP Program (acres)	1,062,395	2,264,658	3,118,024
Number of Farms Enrolled: CRP and WRP Program	15,779	37,655	50,642
Total Number of Farms: Percent Enrolled	5	14	20
Land: Commercial Fertilizer Applied (acres)	36,195,083	38,405,211	38,174,577
Percent Total Land Area: Fertilizer Applied	31	32	32
Percent Total Cropland: Fertilizer Applied	53	58	58
Land: Herbicide Applied (acres)	35,273,848	39,159,906	39,211,386
Percent Total Land Area: Herbicide Applied	30	33	33
Percent Total Cropland: Herbicide Applied	52	59	60

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	294,930	264,857	253,494
Age of Operator (number of farms)			
Under 45 years	112,555	98,457	81,844
45 - 64 years	132,622	114,235	115,852
65 years and Over	49,702	52,146	55,794
Percent of Farms: Operators Age 65+	17	20	22
Principal Occupation (number of farms)			
Farming	198,891	172,768	148,483
Other	96,039	92,089	105,011
Percent of Farms Principal Occupation is Farming	67	65	59

Table 4 Continued: **Upper Mississippi River Basin Characteristics**
(USGS Region Designator Number: **07**)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	294,930	264,857	253,494
Land Area in Farms (acres)	83,421,291	80,402,072	79,912,926
Total Land Area*: Percent in Farms	70	68	67
Average Farm Size	283	304	315
1 - 499 Acre Farm Size			
Number of Farms	246,981	216,194	205,168
Percent of Total Number of Farms	84	82	81
Acreage in Farms	41,367,452	36,697,695	32,953,810
Percent of Land Area in Farms	NR	46	41
500 - 999 Acre Farm Size			
Number of Farms	37,139	35,714	33,119
Percent of Total Number of Farms	13	13	13
Acreage in Farms	24,113,781	24,326,099	22,792,988
Percent of Land Area in Farms	NR	30	29
1000 - 1999 Acre Farm Size			
Number of Farms	9,485	11,130	12,500
Percent of Total Number of Farms	3	4	5
Acreage in Farms	9,371,078	14,483,989	16,505,750
Percent of Land Area in Farms	NR	18	21
2000 Acres and Over Farm Size			
Number of Farms	1,211	1,721	2,609
Percent of Total Number of Farms	0	1	1
Acreage in Farms	3,120,568	4,639,138	7,365,933
Percent of Land Area in Farms	NR	6	9

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 4 Continued:

Upper Mississippi River Basin Characteristics
(USGS Region Designator Number: **07**)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	294,930	264,857	253,494
Land Area in Farms (acres)	83,421,291	80,402,072	79,912,926
Ownership: Individual/Sole Proprietorship			
Number of Farms	252,892	226,371	216,679
Percent of Total Number of Farms	86	85	85
Acreage in Farms	65,681,169	62,628,432	61,125,965
Percent of Land Area in Farms	79	78	76
Ownership: Partnership			
Number of Farms	31,915	27,658	23,380
Percent of Total Number of Farms	11	10	9
Acreage in Farms	11,137,091	10,806,548	10,119,593
Percent of Land Area in Farms	13	13	13
Ownership: Family Corporation			
Number of Farms	8,047	8,714	10,833
Percent of Total Number of Farms	3	4	3
Acreage in Farms	3,207,418	5,610,816	7,390,278
Percent of Land Area in Farms	4	7	9
Ownership: Other Corporation			
Number of Farms	610	769	857
Percent of Total Number of Farms	0	0	0
Acreage in Farms	107,419	98,761	127,670
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	1,363	1,222	1,659
Percent of Total Number of Farms	0	0	1
Acreage in Farms	252,770	111,550	191,779
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 5: Mississippi Headwaters Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 701)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	11,768,623	11,768,623	11,768,623
Land Area in Farms (acres)	4,999,836	4,807,465	4,771,503
Total Land Area*: Percent in Farms	42	41	41
Total Cropland (acres)	3,503,926	3,437,441	3,368,197
Total Woodland (acres)	739,824	673,657	672,698
Total Other Land (acres)	733,128	756,094	696,371
Land in CRP and WRP Program (acres)	54,532	122,031	180,804
Number of Farms Enrolled: CRP and WRP Program	913	2,091	2,942
Total Number of Farms: Percent of Enrolled	4	10	15
Land: Commercial Fertilizer Applied (acres)	1,778,441	1,830,731	1,846,175
Percent Total Land Area: Fertilizer Applied	15	16	16
Percent Total Cropland: Fertilizer Applied	51	53	55
Land: Herbicide Applied (acres)	1,428,943	1,545,604	1,521,227
Percent Total Land Area: Herbicide Applied	12	13	13
Percent Total Cropland: Herbicide Applied	41	45	45

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	22,714	20,169	19,895
Age of Operator (number of farms)			
Under 45 years	8,951	7,507	6,695
45 - 64 years	10,318	9,020	9,269
65 years and Over	3,438	3,632	3,926
Percent of Farms: Operators Age 65+	15	18	20
Principal Occupation (number of farms)			
Farming	13,991	12,372	10,769
Other	8,723	7,797	9,126
Percent of Farms Principal Occupation is Farming	62	61	54

Table 5 Continued: Mississippi Headwaters Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 701)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	22,714	20,169	19,895
Land Area in Farms (acres)	4,999,836	4,807,465	4,771,503
Total Land Area*: Percent in Farms	42	41	41
Average Farm Size	220	238	240
1 - 499 Acre Farm Size			
Number of Farms	20,786	18,058	17,791
Percent of Total Number of Farms	92	90	89
Acreage in Farms	3,350,087	2,972,236	2,769,549
Percent of Land Area in Farms	NR	62	58
500 - 999 Acre Farm Size			
Number of Farms	1,496	1,616	1,536
Percent of Total Number of Farms	7	8	8
Acreage in Farms	938,663	1,069,076	1,017,930
Percent of Land Area in Farms	NR	22	21
1000 - 1999 Acre Farm Size			
Number of Farms	377	406	444
Percent of Total Number of Farms	2	2	2
Acreage in Farms	337,149	519,840	586,213
Percent of Land Area in Farms	NR	11	12
2000 Acres and Over Farm Size			
Number of Farms	48	80	114
Percent of Total Number of Farms	0	0	1
Acreage in Farms	125,457	227,696	347,167
Percent of Land Area in Farms	NR	5	7

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 5 Continued: Mississippi Headwaters Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 701)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	22,714	20,169	19,895
Land Area in Farms (acres)	4,999,836	4,807,465	4,771,503
Ownership: Individual/Sole Proprietorship			
Number of Farms	20,463	18,149	17,860
Percent of Total Number of Farms	90	90	90
Acreage in Farms	4,193,516	4,016,849	3,924,234
Percent of Land Area in Farms	84	84	82
Ownership: Partnership			
Number of Farms	1,773	1,564	1,468
Percent of Total Number of Farms	8	8	7
Acreage in Farms	597,528	528,994	547,677
Percent of Land Area in Farms	12	11	11
Ownership: Family Corporation			
Number of Farms	332	352	415
Percent of Total Number of Farms	1	2	2
Acreage in Farms	118,086	161,169	213,283
Percent of Land Area in Farms	2	3	4
Ownership: Other Corporation			
Number of Farms	55	49	55
Percent of Total Number of Farms	0	0	0
Acreage in Farms	8,358	2,674	4,641
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	73	42	83
Percent of Total Number of Farms	0	0	0
Acreage in Farms	16,850	2,250	7,960
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 6: Minnesota Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 702)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	10,552,107	10,552,107	10,552,107
Land Area in Farms (acres)	8,881,554	8,743,605	8,769,941
Total Land Area*: Percent in Farms	84	83	83
Total Cropland (acres)	7,930,183	7,850,528	7,827,981
Total Woodland (acres)	160,703	151,900	150,816
Total Other Land (acres)	791,139	790,667	741,176
Land in CRP and WRP Program (acres)	157,611	257,786	311,065
Number of Farms Enrolled: CRP and WRP Program	2,168	3,973	4,344
Total Number of Farms: Percent of Enrolled	8	17	21
Land: Commercial Fertilizer Applied (acres)	4,081,447	4,446,404	4,496,984
Percent Total Land Area: Fertilizer Applied	39	42	43
Percent Total Cropland: Fertilizer Applied	51	57	57
Land: Herbicide Applied (acres)	4,884,444	5,560,716	5,680,636
Percent Total Land Area: Herbicide Applied	46	53	54
Percent Total Cropland: Herbicide Applied	62	71	73

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	25,705	22,789	21,189
Age of Operator (number of farms)			
Under 45 years	11,338	9,821	8,147
45 - 64 years	11,223	9,548	9,325
65 years and Over	3,140	3,414	3,722
Percent of Farms: Operators Age 65+	12	15	18
Principal Occupation (number of farms)			
Farming	19,813	17,190	14,538
Other	5,892	5,599	6,651
Percent of Farms Principal Occupation is Farming	77	75	69

Table 6 Continued:

Minnesota Sub-Basin Characteristics
(USGS Sub-Region Designator Number: **702**)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	25,705	22,789	21,189
Land Area in Farms (acres)	8,881,554	8,743,605	8,769,941
Total Land Area*: Percent in Farms	84	83	83
Average Farm Size	346	384	414
1 - 499 Acre Farm Size			
Number of Farms	20,009	16,790	15,189
Percent of Total Number of Farms	78	74	72
Acreage in Farms	3,845,447	3,292,768	2,795,552
Percent of Land Area in Farms	NR	38	32
500 - 999 Acre Farm Size			
Number of Farms	4,321	4,354	3,987
Percent of Total Number of Farms	17	19	19
Acreage in Farms	2,928,988	2,970,928	2,764,468
Percent of Land Area in Farms	NR	34	32
1000 - 1999 Acre Farm Size			
Number of Farms	1,212	1,411	1,661
Percent of Total Number of Farms	5	6	8
Acreage in Farms	1,241,801	1,834,254	2,215,646
Percent of Land Area in Farms	NR	21	25
2000 Acres and Over Farm Size			
Number of Farms	151	225	347
Percent of Total Number of Farms	1	1	2
Acreage in Farms	399,689	633,883	989,341
Percent of Land Area in Farms	NR	7	11

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 6 Continued:

Minnesota Sub-Basin Characteristics
(USGS Sub-Region Designator Number: **702**)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	25,705	22,789	21,189
Land Area in Farms (acres)	8,881,554	8,743,605	8,769,941
Ownership: Individual/Sole Proprietorship			
Number of Farms	22,710	19,974	18,426
Percent of Total Number of Farms	88	88	87
Acreage in Farms	7,389,182	7,135,674	6,964,802
Percent of Land Area in Farms	83	82	79
Ownership: Partnership			
Number of Farms	2,402	2,073	1,790
Percent of Total Number of Farms	9	9	8
Acreage in Farms	1,079,949	983,201	988,756
Percent of Land Area in Farms	12	11	11
Ownership: Family Corporation			
Number of Farms	459	602	798
Percent of Total Number of Farms	2	3	4
Acreage in Farms	180,403	440,929	709,992
Percent of Land Area in Farms	2	5	8
Ownership: Other Corporation			
Number of Farms	37	47	71
Percent of Total Number of Farms	0	0	0
Acreage in Farms	3,867	3,165	1,053
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	86	81	96
Percent of Total Number of Farms	0	0	0
Acreage in Farms	14,343	7,511	9,572
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 7: St. Croix Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 703)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	4,739,589	4,739,589	4,739,589
Land Area in Farms (acres)	1,601,006	1,472,712	1,414,856
Total Land Area*: Percent: in Farms	34	31	30
Total Cropland (acres)	983,321	927,616	862,749
Total Woodland (acres)	376,806	327,134	325,596
Total Other Land (acres)	226,519	240,872	217,961
Land in CRP and WRP Program (acres)	7,206	30,588	53,282
Number of Farms Enrolled: CRP and WRP Program	215	639	1,006
Total Number of Farms: Percent Enrolled	3	10	15
Land: Commercial Fertilizer Applied (acres)	458,253	439,753	460,257
Percent Total Land Area: Fertilizer Applied	10	9	10
Percent Total Cropland: Fertilizer Applied	47	47	53
Land: Herbicide Applied (acres)	256,127	292,123	285,178
Percent Total Land Area: Herbicide Applied	5	6	6
Percent Total Cropland: Herbicide Applied	26	31	33

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	7,573	6,658	6,679
Age of Operator (number of farms)			
Under 45 years	2,730	2,223	1,979
45 - 64 years	3,511	3,017	3,256
65 years and Over	1,324	1,418	1,442
Percent of Farms: Operators Age 65+	17	21	22
Principal Occupation (number of farms)			
Farming	4,277	3,686	3,082
Other	3,296	2,972	3,597
Percent of Farms Principal Occupation is Farming	56	55	46

Table 7 Continued:

St. Croix Sub-Basin Characteristics
(USGS Sub-Region Designator Number: **703**)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	7,573	6,658	6,679
Land Area in Farms (acres)	1,601,006	1,472,712	1,414,856
Total Land Area: Percent in Farms	34	31	30
Average Farm Size	211	221	212
1 - 499 Acre Farm Size			
Number of Farms	6,975	6,037	6,105
Percent of Total Number of Farms	92	91	91
Acreage in Farms	1,112,038	968,812	910,891
Percent of Land Area in Farms	NR	66	64
500 - 999 Acre Farm Size			
Number of Farms	480	506	448
Percent of Total Number of Farms	6	8	7
Acreage in Farms	307,713	331,013	294,268
Percent of Land Area in Farms	NR	22	21
1000 - 1999 Acre Farm Size			
Number of Farms	103	100	104
Percent of Total Number of Farms	1	2	2
Acreage in Farms	79,031	132,635	134,063
Percent of Land Area in Farms	NR	9	9
2000 Acres and Over Farm Size			
Number of Farms	10	11	20
Percent of Total Number of Farms	0	0	0
Acreage in Farms	28,539	23,464	47,176
Percent of Land Area in Farms	NR	2	3

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 7 Continued:

St. Croix Sub-Basin Characteristics
(USGS Sub-Region Designator Number: **703**)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	7,573	6,658	6,679
Land Area in Farms (acres)	1,601,006	1,472,712	1,414,856
Ownership: Individual/Sole Proprietorship			
Number of Farms	6,888	6,023	6,036
Percent of Total Number of Farms	91	90	90
Acreage in Farms	1,343,154	1,220,557	1,161,507
Percent of Land Area in Farms	84	83	82
Ownership: Partnership			
Number of Farms	528	449	392
Percent of Total Number of Farms	7	7	6
Acreage in Farms	119,480	146,819	129,685
Percent of Land Area in Farms	7	10	9
Ownership: Family Corporation			
Number of Farms	134	151	188
Percent of Total Number of Farms	2	2	3
Acreage in Farms	31,010	60,794	99,402
Percent of Land Area in Farms	2	4	7
Ownership: Other Corporation			
Number of Farms	6	13	21
Percent of Total Number of Farms	0	0	0
Acreage in Farms	1,327	2,308	1,532
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	15	19	39
Percent of Total Number of Farms	0	0	1
Acreage in Farms	1,063	1,274	2,989
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 8: Upper Mississippi - Black - Root Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 704)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	6,716,256	6,716,256	6,716,256
Land Area in Farms (acres)	4,713,027	4,554,048	4,566,225
Total Land Area*: Percent: in Farms	70	68	68
Total Cropland (acres)	3,428,516	3,342,428	3,311,470
Total Woodland (acres)	784,211	755,975	764,325
Total Other Land (acres)	490,430	500,306	455,646
Land in CRP and WRP Program (acres)	90,952	167,688	199,168
Number of Farms Enrolled: CRP and WRP Program	1,660	3,324	4,089
Total Number of Farms: Percent Enrolled	9	19	23
Land: Commercial Fertilizer Applied (acres)	1,806,397	1,856,818	1,884,519
Percent Total Land Area: Fertilizer Applied	27	28	28
Percent Total Cropland: Fertilizer Applied	53	56	57
Land: Herbicide Applied (acres)	1,307,726	1,481,938	1,584,877
Percent Total Land Area: Herbicide Applied	19	22	24
Percent Total Cropland: Herbicide Applied	38	44	48

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	19,348	17,781	17,639
Age of Operator (number of farms)			
Under 45 years	7,655	6,927	6,173
45 - 64 years	8,615	7,748	7,988
65 years and Over	3,077	3,103	3,479
Percent of Farms: Operators Age 65+	16	17	20
Principal Occupation (number of farms)			
Farming	13,372	11,962	10,474
Other	5,976	5,819	7,165
Percent of Farms Principal Occupation is Farming	69	67	59

Table 8 Continued: Upper Mississippi-Black-Root Sub-Basin Characteristics
(USGS Sub-Region Designator Number: **704**)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	19,348	17,781	17,639
Land Area in Farms (acres)	4,713,027	4,554,048	4,566,225
Total Land Area: Percent in Farms	70	68	68
Average Farm Size	244	256	259
1 - 499 Acre Farm Size			
Number of Farms	17,247	15,601	15,417
Percent of Total Number of Farms	89	88	87
Acreage in Farms	3,003,511	2,708,016	2,495,345
Percent of Land Area in Farms	NR	59	55
500 - 999 Acre Farm Size			
Number of Farms	1,727	1,718	1,623
Percent of Total Number of Farms	9	10	9
Acreage in Farms	1,143,205	1,146,318	1,090,515
Percent of Land Area in Farms	NR	25	24
1000 - 1999 Acre Farm Size			
Number of Farms	334	391	485
Percent of Total Number of Farms	2	2	3
Acreage in Farms	307,629	508,073	624,434
Percent of Land Area in Farms	NR	11	14
2000 Acres and Over Farm Size			
Number of Farms	45	72	113
Percent of Total Number of Farms	0	0	1
Acreage in Farms	102,271	184,604	319,992
Percent of Land Area in Farms	NR	4	7

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 8 Continued: Upper Mississippi-Black-Root Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 704)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	19,348	17,781	17,639
Land Area in Farms (acres)	4,713,027	4,554,048	4,566,225
Ownership: Individual/Sole Proprietorship			
Number of Farms	16,743	15,396	15,384
Percent of Total Number of Farms	87	87	87
Acreage in Farms	3,711,348	3,543,968	3,548,661
Percent of Land Area in Farms	79	78	78
Ownership: Partnership			
Number of Farms	2,158	1,858	1,649
Percent of Total Number of Farms	11	10	9
Acreage in Farms	639,770	720,970	681,783
Percent of Land Area in Farms	14	16	15
Ownership: Family Corporation			
Number of Farms	365	431	475
Percent of Total Number of Farms	2	3	3
Acreage in Farms	80,822	261,289	268,290
Percent of Land Area in Farms	1	7	8
Ownership: Other Corporation			
Number of Farms	22	38	52
Percent of Total Number of Farms	0	0	0
Acreage in Farms	1,903	2,262	5,341
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	58	60	81
Percent of Total Number of Farms	0	0	0
Acreage in Farms	11,097	4,360	7,851
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, and 1997 Census of Agriculture.

Table 9: Chippewa Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 705)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	5,927,530	5,927,530	5,927,530
Land Area in Farms (acres)	2,296,723	2,112,178	2,052,621
Total Land Area*: Percent in Farms	39	36	35
Total Cropland (acres)	1,446,485	1,359,431	1,283,468
Total Woodland (acres)	577,667	529,349	526,870
Total Other Land (acres)	239,908	272,579	226,227
Land in CRP and WRP Program (acres)	10,555	41,361	68,292
Number of Farms Enrolled: CRP and WRP Program	289	941	1,360
Total Number of Farms: Percent Enrolled	0	11	16
Land: Commercial Fertilizer Applied (acres)	765,036	731,551	724,956
Percent Total Land Area: Fertilizer Applied	13	12	12
Percent Total Cropland: Fertilizer Applied	53	54	56
Land: Herbicide Applied (acres)	362,726	401,453	407,921
Percent Total Land Area: Herbicide Applied	6	7	7
Percent Total Cropland: Herbicide Applied	25	30	32

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	9,528	8,613	8,393
Age of Operator (number of farms)			
Under 45 years	3,713	3,350	2,903
45 - 64 years	4,344	3,747	3,856
65 years and Over	1,473	1,513	1,637
Percent of Farms: Operators Age 65+	15	18	20
Principal Occupation (number of farms)			
Farming	7,168	6,181	5,308
Other	2,360	2,432	3,085
Percent of Farms Principal Occupation is Farming	75	72	63

Table 9 Continued:

Chippewa Sub-Basin Characteristics
(USGS Sub-Region Designator Number: **705**)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	9,528	8,613	8,393
Land Area in Farms (acres)	2,296,723	2,112,178	2,052,621
Total Land Area: Percent in Farms	39	36	35
Average Farm Size	241	245	245
1 - 499 Acre Farm Size			
Number of Farms	8,743	7,813	7,592
Percent of Total Number of Farms	92	91	90
Acreage in Farms	1,674,448	1,488,781	1,350,083
Percent of Land Area in Farms	NR	70	66
500 - 999 Acre Farm Size			
Number of Farms	668	676	640
Percent of Total Number of Farms	7	8	8
Acreage in Farms	339,404	434,107	418,722
Percent of Land Area in Farms	NR	21	20
1000 - 1999 Acre Farm Size			
Number of Farms	100	101	128
Percent of Total Number of Farms	1	1	2
Acreage in Farms	42,552	125,530	162,111
Percent of Land Area in Farms	NR	6	8
2000 Acres and Over Farm Size			
Number of Farms	18	17	30
Percent of Total Number of Farms	0	0	0
Acreage in Farms	51,411	35,415	73,209
Percent of Land Area in Farms	NR	2	4

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

Table 9 Continued:

Chippewa Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 705)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	9,528	8,613	8,393
Land Area in Farms (acres)	2,296,723	2,112,178	2,052,621
Ownership: Individual/Sole Proprietorship			
Number of Farms	8,540	7,692	7,523
Percent of Total Number of Farms	90	89	90
Acreage in Farms	1,892,619	1,728,129	1,669,304
Percent of Land Area in Farms	82	82	81
Ownership: Partnership			
Number of Farms	734	617	533
Percent of Total Number of Farms	8	7	6
Acreage in Farms	55,984	204,990	192,396
Percent of Land Area in Farms	2	10	9
Ownership: Family Corporation			
Number of Farms	226	257	280
Percent of Total Number of Farms	2	3	3
Acreage in Farms	24,577	152,190	155,747
Percent of Land Area in Farms	1	7	8
Ownership: Other Corporation			
Number of Farms	11	12	19
Percent of Total Number of Farms	0	0	0
Acreage in Farms	822	793	950
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	13	25	33
Percent of Total Number of Farms	0	0	0
Acreage in Farms	2,265	2,293	1,722
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 10: Upper Mississippi – Maquoketa - Plum Sub-Basin
 Characteristics (USGS Sub-Region Designator Number: 706)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	5,433,251	5,433,251	5,433,251
Land Area in Farms (acres)	4,666,304	4,532,645	4,445,591
Total Land Area: Percent in Farms	86	83	82
Total Cropland (acres)	3,490,579	3,402,947	3,328,742
Total Woodland (acres)	665,626	637,004	616,822
Total Other Land (acres)	500,023	510,105	492,696
Land in CRP and WRP Program (acres)	116,114	206,070	280,564
Number of Farms Enrolled: CRP and WRP Program	1,400	3,105	4,318
Total Number of Farms: Percent Enrolled	8	18	26
Land: Commercial Fertilizer Applied (acres)	1,835,301	1,963,892	1,901,950
Percent Total Land Area: Fertilizer Applied	34	36	35
Percent Total Cropland: Fertilizer Applied	53	58	57
Land: Herbicide Applied (acres)	1,204,590	1,358,587	1,487,576
Percent Total Land Area: Herbicide Applied	22	25	27
Percent Total Cropland: Herbicide Applied	35	40	45

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	18,231	17,155	16,420
Age of Operator (number of farms)			
Under 45 years	7,400	6,985	5,716
45 - 64 years	8,164	7,330	7,440
65 years and Over	2,667	2,836	3,266
Percent of Farms: Operators Age 65+	15	17	20
Principal Occupation (number of farms)			
Farming	13,852	12,500	10,418
Other	4,379	4,655	6,002
Percent of Farms Principal Occupation is Farming	76	73	63

Table 10 Continued: Upper Mississippi-Maquoketa-Plum Sub-Basin
 Characteristics (USGS Sub-Region Designator Number: 706)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	18,231	17,155	16,420
Land Area in Farms (acres)	4,666,304	4,532,645	4,445,591
Total Land Area: Percent in Farms	86	83	82
Average Farm Size	256	264	271
1 - 499 Acre Farm Size			
Number of Farms	16,099	14,940	14,146
Percent of Total Number of Farms	88	87	86
Acreage in Farms	3,001,031	2,745,612	2,483,992
Percent of Land Area in Farms	NR	61	56
500 - 999 Acre Farm Size			
Number of Farms	1,770	1,791	1,751
Percent of Total Number of Farms	10	10	11
Acreage in Farms	1,114,541	1,191,458	1,164,451
Percent of Land Area in Farms	NR	26	26
1000 - 1999 Acre Farm Size			
Number of Farms	328	386	447
Percent of Total Number of Farms	2	2	3
Acreage in Farms	223,496	493,653	581,681
Percent of Land Area in Farms	NR	11	13
2000 Acres and Over Farm Size			
Number of Farms	28	37	70
Percent of Total Number of Farms	0	0	0
Acreage in Farms	52,078	83,801	177,009
Percent of Land Area in Farms	NR	2	4

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 10 Continued: Upper Mississippi-Maquoketa-Plum Sub-Basin
 Characteristics (USGS Sub-Region Designator Number: 706)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	18,231	17,155	16,420
Land Area in Farms (acres)	4,666,304	4,532,645	4,445,591
Ownership: Individual/Sole Proprietorship			
Number of Farms	15,125	14,288	13,898
Percent of Total Number of Farms	83	83	85
Acreage in Farms	3,595,364	3,483,538	3,444,698
Percent of Land Area in Farms	77	77	77
Ownership: Partnership			
Number of Farms	2,622	2,343	1,878
Percent of Total Number of Farms	14	14	11
Acreage in Farms	789,795	741,785	647,871
Percent of Land Area in Farms	17	16	15
Ownership: Family Corporation			
Number of Farms	367	423	494
Percent of Total Number of Farms	2	2	3
Acreage in Farms	134,074	256,446	315,764
Percent of Land Area in Farms	3	6	7
Ownership: Other Corporation			
Number of Farms	29	36	41
Percent of Total Number of Farms	0	0	0
Acreage in Farms	8,534	2,752	12,035
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	84	61	98
Percent of Total Number of Farms	0	0	1
Acreage in Farms	15,030	4,356	12,485
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 11: Wisconsin Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 707)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	7,365,737	7,365,737	7,365,737
Land Area in Farms (acres)	3,494,494	3,244,908	3,141,026
Total Land Area: Percent in Farms	47	44	43
Total Cropland (acres)	2,181,844	2,062,499	1,974,303
Total Woodland (acres)	878,941	781,792	755,211
Total Other Land (acres)	408,612	433,707	404,073
Land in CRP and WRP Program (acres)	23,762	67,038	106,742
Number of Farms Enrolled: CRP and WRP Program	478	1,505	2,111
Total Number of Farms: Percent Enrolled	3	11	15
Land: Commercial Fertilizer Applied (acres)	1,204,115	1,181,599	1,117,627
Percent Total Land Area: Fertilizer Applied	16	16	15
Percent Total Cropland: Fertilizer Applied	55	57	57
Land: Herbicide Applied (acres)	599,735	706,650	666,974
Percent Total Land Area: Herbicide Applied	8	10	9
Percent Total Cropland: Herbicide Applied	27	34	34

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	15,226	13,968	13,692
Age of Operator (number of farms)			
Under 45 years	5,588	5,219	4,550
45 - 64 years	7,032	6,105	6,370
65 years and Over	2,608	2,642	2,771
Percent of Farms: Operators Age 65+	17	19	20
Principal Occupation (number of farms)			
Farming	10,902	9,446	8,108
Other	4,324	4,522	5,584
Percent of Farms Principal Occupation is Farming	72	68	59

Table 11 Continued: Wisconsin Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 707)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	15,226	13,968	13,692
Land Area in Farms (acres)	3,494,494	3,244,908	3,141,026
Total Land Area: Percent in Farms	47	44	43
Average Farm Size	230	232	229
1 - 499 Acre Farm Size			
Number of Farms	13,986	12,759	12,451
Percent of Total Number of Farms	92	91	91
Acreage in Farms	2,442,814	2,182,502	2,009,380
Percent of Land Area in Farms	NR	67	64
500 - 999 Acre Farm Size			
Number of Farms	1,007	945	937
Percent of Total Number of Farms	7	7	7
Acreage in Farms	659,449	618,068	617,732
Percent of Land Area in Farms	NR	19	20
1000 - 1999 Acre Farm Size			
Number of Farms	187	214	230
Percent of Total Number of Farms	1	2	2
Acreage in Farms	163,259	277,020	292,976
Percent of Land Area in Farms	NR	9	9
2000 Acres and Over Farm Size			
Number of Farms	40	48	67
Percent of Total Number of Farms	0	0	0
Acreage in Farms	121,836	150,158	212,907
Percent of Land Area in Farms	NR	5	7

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 11 Continued: Wisconsin Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 707)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	15,226	13,968	13,692
Land Area in Farms (acres)	3,494,494	3,244,908	3,141,026
Ownership: Individual/Sole Proprietorship			
Number of Farms	13,024	11,937	11,719
Percent of Total Number of Farms	86	85	86
Acreage in Farms	2,617,728	2,405,255	2,289,606
Percent of Land Area in Farms	75	74	73
Ownership: Partnership			
Number of Farms	1,655	1,460	1,259
Percent of Total Number of Farms	11	10	9
Acreage in Farms	426,753	447,855	402,114
Percent of Land Area in Farms	12	14	13
Ownership: Family Corporation			
Number of Farms	456	468	586
Percent of Total Number of Farms	3	3	4
Acreage in Farms	260,503	330,515	388,814
Percent of Land Area in Farms	7	10	12
Ownership: Other Corporation			
Number of Farms	33	52	53
Percent of Total Number of Farms	0	0	0
Acreage in Farms	16,253	3,294	18,251
Percent of Land Area in Farms	0	0	1
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	55	42	72
Percent of Total Number of Farms	0	0	1
Acreage in Farms	10,139	4,013	14,968
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 12: Upper Mississippi - Iowa - Skunk - Wapsipinicon
Sub-Basin Characteristics (USGS Sub-Region Designator Number: 708)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	14,556,217	14,556,217	14,556,217
Land Area in Farms (acres)	12,751,968	12,442,596	12,512,167
Total Land Area*: Percent in Farms	88	85	86
Total Cropland (acres)	11,275,211	11,073,695	11,032,010
Total Woodland (acres)	491,161	457,999	488,366
Total Other Land (acres)	991,783	985,593	910,895
Land in CRP and WRP Program (acres)	209,344	443,270	591,206
Number of Farms Enrolled: CRP and WRP Program	2,919	7,046	9,694
Total Number of Farms: Percent Enrolled	7	17	26
Land: Commercial Fertilizer Applied (acres)	5,811,526	6,408,180	6,265,514
Percent Total Land Area: Fertilizer Applied	40	44	43
Percent Total Cropland: Fertilizer Applied	52	58	57
Land: Herbicide Applied (acres)	6,299,378	7,106,999	7,283,884
Percent Total Land Area: Herbicide Applied	43	49	50
Percent Total Cropland: Herbicide Applied	56	64	66

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	44,322	39,944	37,886
Age of Operator (number of farms)			
Under 45 years	17,430	15,433	12,254
45 - 64 years	19,923	17,102	17,345
65 years and Over	6,966	7,407	8,276
Percent of Farms: Operators Age 65+	16	19	22
Principal Occupation (number of farms)			
Farming	30,898	26,916	22,933
Other	13,424	13,028	14,953
Percent of Farms Principal Occupation is Farming	70	67	61

Table 12 Continued: Upper Mississippi-Iowa-Skunk-Wapsipinicon Sub-Basin
 Characteristics (USGS Sub-Region Designator Number: 708)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	44,322	39,944	37,886
Land Area in Farms (acres)	12,751,968	12,442,596	12,512,167
Total Land Area: Percent in Farms	88	85	86
Average Farm Size	288	312	330
1 - 499 Acre Farm Size			
Number of Farms	36,372	31,701	29,489
Percent of Total Number of Farms	82	79	78
Acreage in Farms	6,144,097	5,442,508	4,794,093
Percent of Land Area in Farms	NR	44	38
500 - 999 Acre Farm Size			
Number of Farms	6,451	6,323	5,962
Percent of Total Number of Farms	15	16	16
Acreage in Farms	3,978,089	4,305,383	4,098,994
Percent of Land Area in Farms	NR	35	33
1000 - 1999 Acre Farm Size			
Number of Farms	1,384	1,740	2,142
Percent of Total Number of Farms	3	4	6
Acreage in Farms	907,038	2,210,375	2,775,933
Percent of Land Area in Farms	NR	18	22
2000 Acres and Over Farm Size			
Number of Farms	107	176	287
Percent of Total Number of Farms	0	0	1
Acreage in Farms	212,983	431,033	811,785
Percent of Land Area in Farms	NR	3	6

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 12 Continued: Upper Mississippi-Iowa-Skunk-Wapsipinicon Sub-Basin
 Characteristics (USGS Sub-Region Designator Number: 708)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	44,322	39,944	37,886
Land Area in Farms (acres)	12,751,968	12,442,596	12,512,167
Ownership: Individual/Sole Proprietorship			
Number of Farms	37,267	33,319	31,376
Percent of Total Number of Farms	84	83	83
Acreage in Farms	9,834,838	9,465,058	9,197,575
Percent of Land Area in Farms	77	76	74
Ownership: Partnership			
Number of Farms	4,666	4,167	3,389
Percent of Total Number of Farms	11	10	9
Acreage in Farms	1,541,738	1,504,267	1,320,607
Percent of Land Area in Farms	12	12	11
Ownership: Family Corporation			
Number of Farms	2,025	2,087	2,687
Percent of Total Number of Farms	5	5	7
Acreage in Farms	801,009	1,305,925	1,815,418
Percent of Land Area in Farms	6	10	15
Ownership: Other Corporation			
Number of Farms	133	159	162
Percent of Total Number of Farms	0	0	0
Acreage in Farms	24,285	19,155	19,620
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	210	192	249
Percent of Total Number of Farms	0	0	1
Acreage in Farms	46,466	21,952	30,669
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 13: Rock Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 709)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	6,907,011	6,907,011	6,907,011
Land Area in Farms (acres)	5,553,270	5,256,764	5,153,528
Percent: Total Land Area in Farms	80	76	75
Total Cropland (acres)	4,805,376	4,579,851	4,456,650
Total Woodland (acres)	298,659	271,711	271,347
Total Other Land (acres)	425,530	449,237	405,194
Land in CRP and WRP Program (acres)	42,461	113,144	163,470
Number of Farms: CRP and WRP Program	828	2,521	3,378
Total Number of Farms: Percent Enrolled	3	13	18
Land: Commercial Fertilizer Applied (acres)	3,039,515	3,138,249	3,061,448
Percent Total Land Area: Fertilizer Applied	44	45	44
Percent Total Cropland: Fertilizer Applied	63	69	69
Land: Herbicide Applied (acres)	2,173,346	2,468,389	2,627,243
Percent Total Land Area: Herbicide Applied	31	36	38
Percent Total Cropland: Herbicide Applied	45	54	59

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	21,904	19,710	18,670
Age of Operator (number of farms)			
Under 45 years	8,109	7,182	5,854
45 - 64 years	10,128	8,620	8,638
65 years and Over	3,667	3,906	4,179
Percent of Farms: Operators Age 65+	17	20	22
Principal Occupation (number of farms)			
Farming	15,405	13,216	11,207
Other	6,499	6,494	7,463
Percent of Farms Principal Occupation is Farming	70	67	60

Table 13 Continued: Rock Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 709)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	21,904	19,710	18,670
Land Area in Farms (acres)	5,553,270	5,256,764	5,153,528
Total Land Area*: Percent in Farms	80	76	75
Average Farm Size	254	267	276
1 - 499 Acre Farm Size			
Number of Farms	19,082	16,883	15,828
Percent of Total Number of Farms	87	86	85
Acreage in Farms	2,876,233	2,678,095	2,348,091
Percent of Land Area in Farms	NR	51	46
500 - 999 Acre Farm Size			
Number of Farms	2,222	2,062	1,971
Percent of Total Number of Farms	10	10	11
Acreage in Farms	1,498,873	1,403,239	1,349,519
Percent of Land Area in Farms	NR	27	26
1000 - 1999 Acre Farm Size			
Number of Farms	498	647	675
Percent of Total Number of Farms	2	3	4
Acreage in Farms	591,338	850,609	899,243
Percent of Land Area in Farms	NR	16	17
2000 Acres and Over Farm Size			
Number of Farms	93	108	189
Percent of Total Number of Farms	0	1	1
Acreage in Farms	253,927	317,300	542,070
Percent of Land Area in Farms	NR	6	11

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

Table 13 Continued: Rock Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 709)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	21,904	19,710	18,670
Land Area in Farms (acres)	5,553,270	5,256,764	5,153,528
Ownership: Individual/Sole Proprietorship			
Number of Farms	17,983	16,264	15,666
Percent of Total Number of Farms	82	83	84
Acreage in Farms	4,075,395	3,873,377	3,831,176
Percent of Land Area in Farms	73	74	74
Ownership: Partnership			
Number of Farms	3,160	2,638	2,038
Percent of Total Number of Farms	14	13	11
Acreage in Farms	1,045,473	968,360	846,446
Percent of Land Area in Farms	19	18	16
Ownership: Family Corporation			
Number of Farms	590	626	732
Percent of Total Number of Farms	3	3	4
Acreage in Farms	271,981	350,218	409,857
Percent of Land Area in Farms	5	7	8
Ownership: Other Corporation			
Number of Farms	52	70	76
Percent of Total Number of Farms	0	0	0
Acreage in Farms	10,083	12,136	15,658
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	116	96	155
Percent of Total Number of Farms	1	0	1
Acreage in Farms	17,966	12,881	19,585
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 14: Des Moines Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 710)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	9,149,748	9,149,748	9,149,748
Land Area in Farms (acres)	8,105,466	8,085,290	7,993,566
Total Land Area*: Percent: in Farms	89	88	87
Total Cropland (acres)	7,064,844	7,085,935	6,949,922
Total Woodland (acres)	281,830	265,845	292,660
Total Other Land (acres)	750,982	758,797	733,506
Land in CRP and WRP Program (acres)	133,151	270,260	357,193
Number of Farms Enrolled: CRP and WRP Program	1,878	4,083	5,311
Total Number of Farms: Percent Enrolled	7	18	25
Land: Commercial Fertilizer Applied (acres)	3,245,197	3,608,996	3,581,872
Percent Total Land Area: Fertilizer Applied	35	39	39
Percent Total Cropland: Fertilizer Applied	46	51	52
Land: Herbicide Applied (acres)	4,248,694	4,843,101	4,635,107
Percent Total Land Area: Herbicide Applied	46	53	51
Percent Total Cropland: Herbicide Applied	60	68	67

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	25,353	23,069	21,537
Age of Operator (number of farms)			
Under 45 years	9,736	8,795	6,864
45 - 64 years	11,513	9,735	9,723
65 years and Over	4,106	4,542	4,952
Percent of Farms: Operators Age 65+	16	20	23
Principal Occupation (number of farms)			
Farming	17,891	15,759	13,346
Other	7,462	7,310	8,191
Percent of Farms Principal Occupation is Farming	71	68	62

Table 14 Continued: Des Moines Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 710)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	25,353	23,069	21,537
Land Area in Farms (acres)	8,105,466	8,085,290	7,993,566
Percent: Total Land Area in Farms	89	88	87
Average Farm Size	320	350	371
1 - 499 Acre Farm Size			
Number of Farms	20,050	17,441	15,946
Percent of Total Number of Farms	79	76	74
Acreage in Farms	3,691,800	3,251,663	2,801,211
Percent of Land Area in Farms	NR	40	35
500 - 999 Acre Farm Size			
Number of Farms	4,281	4,319	3,971
Percent of Total Number of Farms	17	19	18
Acreage in Farms	2,884,815	2,955,951	2,756,025
Percent of Land Area in Farms	NR	37	34
1000 - 1999 Acre Farm Size			
Number of Farms	930	1,158	1,382
Percent of Total Number of Farms	4	5	6
Acreage in Farms	951,381	1,497,106	1,817,615
Percent of Land Area in Farms	NR	19	23
2000 Acres and Over Farm Size			
Number of Farms	92	143	232
Percent of Total Number of Farms	0	1	1
Acreage in Farms	215,973	359,057	610,411
Percent of Land Area in Farms	NR	4	8

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 14 Continued: Des Moines Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 710)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	25,353	23,069	21,537
Land Area in Farms (acres)	8,105,466	8,085,290	7,993,566
Ownership: Individual/Sole Proprietorship			
Number of Farms	21,761	19,696	18,275
Percent of Total Number of Farms	86	85	85
Acreage in Farms	6,546,123	6,405,268	6,183,361
Percent of Land Area in Farms	81	79	77
Ownership: Partnership			
Number of Farms	2,433	2,163	1,827
Percent of Total Number of Farms	10	9	8
Acreage in Farms	877,686	876,817	823,457
Percent of Land Area in Farms	11	11	10
Ownership: Family Corporation			
Number of Farms	949	1,008	1,241
Percent of Total Number of Farms	4	4	6
Acreage in Farms	326,266	689,907	876,887
Percent of Land Area in Farms	4	9	11
Ownership: Other Corporation			
Number of Farms	65	77	88
Percent of Total Number of Farms	0	0	0
Acreage in Farms	7,830	12,580	4,948
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	138	120	102
Percent of Total Number of Farms	1	1	0
Acreage in Farms	25,496	10,135	10,412
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 15: Upper Mississippi - Salt Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 711)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	6,330,367	6,330,367	6,330,367
Land Area in Farms (acres)	5,041,887	4,821,856	4,885,041
Percent: Total Land Area in Farms	80	76	77
Total Cropland (acres)	3,739,900	3,594,188	3,591,153
Total Woodland (acres)	659,818	609,933	657,083
Total Other Land (acres)	636,810	642,169	617,723
Land in CRP and WRP Program (acres)	113,234	256,267	389,781
Number of Farms: CRP and WRP Program	1,103	2,618	3,928
Total Number of Farms: Percent of Farms	7	19	28
Land: Commercial Fertilizer Applied (acres)	1,850,381	1,882,893	1,920,987
Percent Total Land Area: Fertilizer Applied	29	30	30
Percent Total Cropland: Fertilizer Applied	49	52	53
Land: Herbicide Applied (acres)	1,808,640	1,590,943	1,755,061
Percent Total Land Area: Herbicide Applied	29	25	28
Percent Total Cropland: Herbicide Applied	48	44	49

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	15,571	14,080	14,030
Age of Operator (number of farms)			
Under 45 years	5,243	4,516	3,909
45 - 64 years	6,686	5,834	6,169
65 years and Over	3,630	3,731	3,949
Percent of Farms: Operators Age 65+	23	26	28
Principal Occupation (number of farms)			
Farming	9,199	7,967	7,084
Other	6,372	6,113	6,946
Percent of Farms Principal Occupation is Farming	59	57	50

Table 15 Continued: Upper Mississippi - Salt Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 711)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	15,571	14,080	14,030
Land Area in Farms (acres)	5,041,887	4,821,856	4,885,041
Total Land Area*: Percent in Farms	80	76	77
Average Farm Size	324	342	348
1 - 499 Acre Farm Size			
Number of Farms	12,331	11,060	11,111
Percent of Total Number of Farms	79	79	79
Acreage in Farms	2,028,561	1,809,475	1,796,879
Percent of Land Area in Farms	NR	38	37
500 - 999 Acre Farm Size			
Number of Farms	2,276	1,991	1,818
Percent of Total Number of Farms	15	14	13
Acreage in Farms	1,554,514	1,368,734	1,265,613
Percent of Land Area in Farms	NR	28	26
1000 - 1999 Acre Farm Size			
Number of Farms	806	844	856
Percent of Total Number of Farms	5	6	6
Acreage in Farms	1,020,344	1,131,517	1,152,197
Percent of Land Area in Farms	NR	23	24
2000 Acres and Over Farm Size			
Number of Farms	145	182	234
Percent of Total Number of Farms	1	1	2
Acreage in Farms	397,673	507,516	667,628
Percent of Land Area in Farms	NR	8	11

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 15 Continued: Upper Mississippi - Salt Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 711)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	15,571	14,080	14,030
Land Area in Farms (acres)	5,041,887	4,821,856	4,885,041
Ownership: Individual/Sole Proprietorship			
Number of Farms	13,267	11,999	12,016
Percent of Total Number of Farms	85	85	86
Acreage in Farms	3,886,708	3,713,441	3,747,336
Percent of Land Area in Farms	77	77	77
Ownership: Partnership			
Number of Farms	1,898	1,623	1,371
Percent of Total Number of Farms	12	12	10
Acreage in Farms	858,863	749,009	668,055
Percent of Land Area in Farms	17	16	14
Ownership: Family Corporation			
Number of Farms	311	340	463
Percent of Total Number of Farms	2	2	3
Acreage in Farms	166,683	259,625	364,691
Percent of Land Area in Farms	3	5	7
Ownership: Other Corporation			
Number of Farms	28	39	36
Percent of Total Number of Farms	0	0	0
Acreage in Farms	2,711	6,023	6,356
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	59	81	132
Percent of Total Number of Farms	0	1	1
Acreage in Farms	8,742	2,124	13,716
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 16: Upper Illinois Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 712)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	6,942,312	6,942,312	6,942,312
Land Area in Farms (acres)	4,694,023	4,493,737	4,301,054
Total Land Area*:Percent in Farms	68	65	62
Total Cropland (acres)	4,322,971	4,182,505	3,981,648
Total Woodland (acres)	147,508	125,258	128,249
Total Other Land (acres)	191,143	223,567	185,971
Land in CRP and WRP Program (acres)	12,824	39,971	61,726
Number of Farms Enrolled: CRP and WRP Program	300	957	1,434
Total Number of Farms: Percent Enrolled	2	7	12
Land: Commercial Fertilizer Applied (acres)	2,721,171	2,773,093	2,761,580
Percent Total Land Area: Fertilizer Applied	39	40	40
Percent Total Cropland: Fertilizer Applied	63	66	69
Land: Herbicide Applied (acres)	2,663,570	2,993,888	2,788,956
Percent Total Land Area: Herbicide Applied	38	43	40
Percent Total Cropland: Herbicide Applied	62	72	70

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	15,684	13,461	12,267
Age of Operator (number of farms)			
Under 45 years	5,662	4,668	3,595
45 - 64 years	7,157	5,975	5,720
65 years and Over	2,857	2,824	2,955
Percent of Farms: Operators Age 65+	18	21	24
Principal Occupation (number of farms)			
Farming	9,919	8,198	7,042
Other	5,765	5,263	5,225
Percent of Farms Principal Occupation is Farming	63	61	57

Table 16 Continued: Upper Illinois Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 712)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	15,684	13,461	12,267
Land Area in Farms (acres)	4,694,023	4,493,737	4,301,054
Total Land Area*: Percent in Farms	68	65	62
Average Farm Size	299	334	351
1 - 499 Acre Farm Size			
Number of Farms	12,572	10,319	9,345
Percent of Total Number of Farms	80	77	76
Acreage in Farms	1,570,739	1,464,100	1,246,476
Percent of Land Area in Farms	NR	33	29
500 - 999 Acre Farm Size			
Number of Farms	2,286	2,114	1,846
Percent of Total Number of Farms	15	16	15
Acreage in Farms	1,479,278	1,462,262	1,292,148
Percent of Land Area in Farms	NR	33	30
1000 - 1999 Acre Farm Size			
Number of Farms	715	866	857
Percent of Total Number of Farms	5	6	7
Acreage in Farms	845,082	1,129,436	1,146,313
Percent of Land Area in Farms	NR	25	27
2000 Acres and Over Farm Size			
Number of Farms	101	144	207
Percent of Total Number of Farms	1	1	2
Acreage in Farms	278,740	421,761	606,473
Percent of Land Area in Farms	NR	9	14

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 16 Continued: Upper Illinois Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 712)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	15,684	13,461	12,267
Land Area in Farms (acres)	4,694,023	4,493,737	4,301,054
Ownership: Individual/Sole Proprietorship			
Number of Farms	12,993	11,019	9,969
Percent of Total Number of Farms	83	82	81
Acreage in Farms	3,521,460	3,305,835	3,148,542
Percent of Land Area in Farms	75	74	73
Ownership: Partnership			
Number of Farms	1,885	1,596	1,285
Percent of Total Number of Farms	12	12	10
Acreage in Farms	693,386	742,498	650,388
Percent of Land Area in Farms	15	17	15
Ownership: Family Corporation			
Number of Farms	642	685	821
Percent of Total Number of Farms	4	5	7
Acreage in Farms	265,657	373,445	438,199
Percent of Land Area in Farms	6	8	10
Ownership: Other Corporation			
Number of Farms	52	59	66
Percent of Total Number of Farms	0	0	1
Acreage in Farms	9,937	4,651	7,824
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	102	89	126
Percent of Total Number of Farms	1	1	1
Acreage in Farms	22,722	6,889	12,497
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 17: Lower Illinois Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 713)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	11,328,418	11,328,418	11,328,418
Land Area in Farms (acres)	10,075,241	9,534,638	9,588,691
Total Land Area*: Percent: in Farms	89	84	85
Total Cropland (acres)	8,848,935	8,439,141	8,450,774
Total Woodland (acres)	615,890	539,655	560,477
Total Other Land (acres)	577,439	610,428	555,843
Land in CRP and WRP Program (acres)	40,727	117,743	148,854
Number of Farms Enrolled: CRP and WRP Program	785	2,467	3,129
Total Number of Farms: Percent Enrolled	3	10	14
Land: Commercial Fertilizer Applied (acres)	4,820,818	5,057,038	5,035,791
Percent Total Land Area: Fertilizer Applied	43	45	44
Percent Total Cropland: Fertilizer Applied	54	60	60
Land: Herbicide Applied (acres)	5,532,149	6,177,886	5,845,429
Percent Total Land Area: Herbicide Applied	49	55	52
Percent Total Cropland: Herbicide Applied	63	73	69

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	28,429	24,650	22,809
Age of Operator (number of farms)			
Under 45 years	10,356	8,551	6,816
45 - 64 years	12,742	10,421	10,407
65 years and Over	5,328	5,683	5,582
Percent of Farms: Operators Age 65+	19	23	24
Principal Occupation (number of farms)			
Farming	19,345	15,939	13,905
Other	9,084	8,711	8,904
Percent of Farms Principal Occupation is Farming	68	65	61

Table 17 Continued: Lower Illinois Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 713)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	28,429	24,650	22,809
Land Area in Farms (acres)	10,075,241	9,534,638	9,588,691
Total Land Area*: Percent in Farms	89	84	85
Average Farm Size	354	387	420
1 - 499 Acre Farm Size			
Number of Farms	21,109	17,658	15,973
Percent of Total Number of Farms	74	72	70
Acreage in Farms	3,506,994	2,894,427	2,508,724
Percent of Land Area in Farms	NR	30	26
500 - 999 Acre Farm Size			
Number of Farms	5,442	4,755	4,283
Percent of Total Number of Farms	19	19	19
Acreage in Farms	3,444,362	3,322,764	3,036,190
Percent of Land Area in Farms	NR	35	32
1000 - 1999 Acre Farm Size			
Number of Farms	1,671	1,933	2,095
Percent of Total Number of Farms	6	8	9
Acreage in Farms	1,851,791	2,543,405	2,788,272
Percent of Land Area in Farms	NR	27	29
2000 Acres and Over Farm Size			
Number of Farms	185	295	448
Percent of Total Number of Farms	1	1	2
Acreage in Farms	501,824	761,833	1,255,504
Percent of Land Area in Farms	NR	8	13

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 17 Continued: Lower Illinois Sub-Basin Characteristics
(USGS Sub-Region Designator Number: 713)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	28,429	24,650	22,809
Land Area in Farms (acres)	10,075,241	9,534,638	9,588,691
Ownership: Individual/Sole Proprietorship			
Number of Farms	23,877	20,733	19,077
Percent of Total Number of Farms	84	84	84
Acreage in Farms	7,857,563	7,420,594	7,233,058
Percent of Land Area in Farms	78	78	75
Ownership: Partnership			
Number of Farms	3,552	2,921	2,520
Percent of Total Number of Farms	12	12	11
Acreage in Farms	1,513,805	1,316,037	1,376,997
Percent of Land Area in Farms	15	14	14
Ownership: Family Corporation			
Number of Farms	706	731	934
Percent of Total Number of Farms	2	3	4
Acreage in Farms	376,948	612,673	835,325
Percent of Land Area in Farms	4	6	9
Ownership: Other Corporation			
Number of Farms	49	76	69
Percent of Total Number of Farms	0	0	0
Acreage in Farms	8,239	24,920	19,498
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	238	188	212
Percent of Total Number of Farms	1	1	1
Acreage in Farms	36,805	20,429	31,844
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

Table 18: Upper Mississippi – Kaskaskia - Meramec Sub-Basin
 Characteristics (USGS Sub-Region Designator Number: **714**)

AGRICULTURAL LAND USE SUMMARY			
	1987	1992	1997
Approximate Land Area (acres)	10,684,351	10,684,351	10,684,351
Land Area in Farms (acres)	6,546,492	6,299,630	6,317,116
Total Land Area*: Percent in Farms	61	59	59
Total Cropland (acres)	5,033,668	4,916,658	4,867,358
Total Woodland (acres)	951,871	892,691	910,796
Total Other Land (acres)	538,964	560,950	490,275
Land in CRP and WRP Program (acres)	49,922	131,441	205,877
Number of Farms Enrolled: CRP and WRP Program	843	2,385	3,598
Total Number of Farms: Percent Enrolled	3	10	16
Land: Commercial Fertilizer Applied (acres)	2,777,485	3,086,014	3,114,917
Percent Total Land Area: Fertilizer Applied	26	29	29
Percent Total Cropland: Fertilizer Applied	55	63	64
Land: Herbicide Applied (acres)	2,503,780	2,631,629	2,641,317
Percent Total Land Area: Herbicide Applied	23	25	25
Percent Total Cropland: Herbicide Applied	50	54	54

FARM OPERATOR: AGE AND PRINCIPAL OCCUPATION			
	1987	1992	1997
Total Number of Farms	25,342	22,810	22,388
Age of Operator (number of farms)			
Under 45 years	8,644	7,280	6,389
45 - 64 years	11,266	10,033	10,346
65 years and Over	5,421	5,495	5,658
Percent of Farms: Operators Age 65+	21	24	25
Principal Occupation (number of farms)			
Farming	12,859	11,436	10,269
Other	12,483	11,374	12,119
Percent of Farms Principal Occupation is Farming	51	50	46

Table 18 Continued: Upper Mississippi-Kaskaskia-Meramec Sub-Basin
 Characteristics (USGS Sub-Region Designator Number: 714)

NUMBER OF FARMS AND FARM SIZE			
	1987	1992	1997
Total Number of Farms	25,342	22,810	22,388
Land Area in Farms (acres)	6,546,492	6,299,630	6,317,116
Total Land Area*: Percent in Farms	61	59	59
Average Farm Size	258	276	282
1 - 499 Acre Farm Size			
Number of Farms	21,620	19,134	18,785
Percent of Total Number of Farms	85	84	84
Acreage in Farms	3,119,652	2,798,700	2,643,544
Percent of Land Area in Farms	NR	44	42
500 - 999 Acre Farm Size			
Number of Farms	2,712	2,544	2,346
Percent of Total Number of Farms	11	11	10
Acreage in Farms	1,841,887	1,746,798	1,626,413
Percent of Land Area in Farms	NR	28	26
1000 - 1999 Acre Farm Size			
Number of Farms	840	933	994
Percent of Total Number of Farms	3	4	4
Acreage in Farms	809,187	1,230,536	1,329,053
Percent of Land Area in Farms	NR	20	21
2000 Acres and Over Farm Size			
Number of Farms	148	183	251
Percent of Total Number of Farms	1	1	1
Acreage in Farms	378,167	501,617	705,261
Percent of Land Area in Farms	NR	8	11

* Total Land Area includes **all** land, regardless of use.

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49.

Data Disclosure: In some instances, data reported at a detailed level (e.g. acreage in farms for each farm size category) will be under-reported. This phenomenon is due to data reporting within the 1997 Census of Agriculture. Instances where providing detailed information would disclose information about individual farms, thereby violating data privacy, the Census of Agriculture does not disclose the information. Therefore, totaling certain values (e.g. acreage in each farm size category) in these instances will result in a value LESS than the corresponding value reported for the basin as a whole.

NR = Not Reported

Table 18 Continued: Upper Mississippi-Kaskaskia-Meramec Sub-Basin
 Characteristics (USGS Sub-Region Designator Number: 714)

FARM OWNERSHIP			
	1987	1992	1997
Total Number of Farms	25,342	22,810	22,388
Land Area in Farms (acres)	6,546,492	6,299,630	6,317,116
Ownership: Individual/Sole Proprietorship			
Number of Farms	22,251	19,882	19,454
Percent of Total Number of Farms	88	87	87
Acreage in Farms	5,216,171	4,910,889	4,782,105
Percent of Land Area in Farms	80	78	76
Ownership: Partnership			
Number of Farms	2,449	2,186	1,981
Percent of Total Number of Farms	10	10	9
Acreage in Farms	896,881	874,946	843,361
Percent of Land Area in Farms	14	14	13
Ownership: Family Corporation			
Number of Farms	485	553	719
Percent of Total Number of Farms	2	2	3
Acreage in Farms	169,399	355,691	498,609
Percent of Land Area in Farms	3	6	8
Ownership: Other Corporation			
Number of Farms	38	42	48
Percent of Total Number of Farms	0	0	0
Acreage in Farms	3,270	2,048	9,963
Percent of Land Area in Farms	0	0	0
Ownership: Other (Estates, Trusts, etc)			
Number of Farms	116	126	181
Percent of Total Number of Farms	0	1	1
Acreage in Farms	23,786	11,083	15,509
Percent of Land Area in Farms	0	0	0

Note: Percentages have been rounded to the nearest whole number. Therefore 0% can range from 0 - 0.49. SOURCE: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture.

APPENDIX A: Notes on Agricultural Data Calculations for Hydrologic Units

Agricultural data for this report originated from various reporting years of the USDA Census of Agriculture, which reports its data by *county*. A major goal of this report, however, is to present such information at various *watershed* levels. In order to evaluate agricultural practices by watershed areas, therefore, two methods of assessing the data are utilized, both involving the use of a geographic information system (GIS). The first of these methods is a simple graphic overlay in which watershed boundaries are drawn on top of county-level thematic maps using a combination of GIS and graphics software. This method allows the reader to make a rudimentary visual assessment of agricultural information for a given watershed, based on patterns of thematic data represented in the underlying county-level map. Many of the maps in this report are of this type. This method is further enhanced through the use of map transparencies that contain additional layers of information. These removable sheets (found inside the back cover) can be placed on top of maps in this report to give the reader additional information with which to make assessments.

While the above method of visual interpretation is of certain value, it has its limitations. The major drawback is that the impressions gleaned from reading these maps are not immediately quantifiable, and so are difficult to interpret beyond the confines of this report. Additionally, interpretations are somewhat subjective, relying on the interpretive skills of the map reader. Therefore, in order to determine quantifiable data values for watersheds, a procedure called *areal interpolation* was undertaken for this report. This procedure utilizes GIS and database management software to produce mathematical estimates of attribute data values for USGS hydrologic cataloging units, based on data that were originally collected over the same geographic area (i.e., the UMRB) at the county level.

The procedure works this way: Using GIS software, the intersection of two geographic boundary files (i.e., counties and USGS hydrologic units) is calculated, resulting in a new geographic boundary file in which each new polygonal boundary unit nests completely within a singular county boundary, and also within a singular cataloging unit boundary. As a byproduct of this procedure, a data table is produced that contains unique identifiers for *both* of the original spatial boundaries. Raw data (i.e., extensive, or non-derived data) from the USDA Census of Agriculture, or another source, is then related to this intersected boundary table by a unique *county* identifier (i.e., FIPS code). A weight factor is next calculated that represents the percentage of the corresponding original county area occupied by each individual polygon produced through the intersection of geographic boundaries. (In theory, then, the sum of weight factors for all polygons falling within one county boundary is equal to one (i.e., 100 percent), though the actual value varies slightly due to computational anomalies.) Raw county-level data are then multiplied by this weight factor to produce an estimated value for each new polygon. These values are then summarized by watershed delineations (e.g., USGS hydrologic regions, sub-regions, or cataloging units) according to unique hydrologic unit designators in the table. Once these raw data are aggregated to a particular hydrologic unit, derived data values (percentages, ratios, densities, etc.) can then be calculated for use in tables, charts, graphs, maps, etc. Most of the maps in this report that show thematic data by USGS cataloging unit—as well as tabular data found in the back of the report—were produced using data derived in this manner.

While the areal interpolation method does not produce *exact* values for watershed-level data, the process results in numbers that closely approximate actual values in a non-arbitrary manner. In addition to mathematical tests for determining the effectiveness of the areal interpolation, a visual comparison of some of the maps found in this report helps to demonstrate the accuracy of the resulting data estimates. By visually comparing map pairs that display the same data theme for the same year, but for different spatial units (i.e., county versus cataloging unit), a similar distribution of values can be seen across the UMRB. These maps are: *Land In Farms*, *Farmland Consolidation*, *Fertilizer Application**, *Herbicide Use**, *CRP/CWP Participation*, *Family Corporate Farms**, and *Farmers Age 65 and Older*. Patterns on these maps will not be identical, partially due to differences in the size and shape of counties and hydrologic units; nonetheless, a map pair that passes the "squinted eye" test should be seen as a strong indication that the interpolated data estimates for hydrologic units closely approximate the source county-level data. The interpolation process, as well, helps to strengthen data estimates for hydrologic units by reducing the influence of county-level data from areas *outside* the Basin. The total land area of all counties that in part, or entirely, fall within the UMRB boundary is approximately 29 percent greater than the total land area of the Basin, itself. By physically removing those external areas from the data model—particularly from the large northern counties where little agricultural activity takes place—the interpolation procedure results in estimates for hydrologic units that better represent the original county-level data from the Census of Agriculture. This improvement is particularly significant for hydrologic units along the perimeter of the UMRB, and for the Basin as a whole.

Limitations to data accuracy result, in part, from the assumption of attribute homogeneity within the original county boundaries for which the source data was reported. The interpolation model used to calculate data by hydrologic unit for this report assumes that the phenomena being studied are evenly distributed across the counties in which they are originally reported. In reality, though, these phenomena are unlikely to have a completely even distribution, and could actually be concentrated entirely in one small corner of a county. As a result, some attribute drift occurs during the interpolation process, but a generally accurate basin-wide distribution of data values is achieved. It is important here to note that aggregation of data to increasingly-higher-order hydrologic units (i.e., cataloging units, sub-regions, regions...) increasingly helps to counteract the effects of any attribute drift resulting from the interpolation process. As a result of this phenomenon, data estimates for hydrologic units are best suited for overall regional analysis, rather than for use in localized, site-specific analysis and planning. While valuable for assessing general patterns and trends in the UMRB, and for directing general programmatic resources, it should not be forgotten that agricultural data reported by hydrologic unit in this document are strictly mathematical estimates of actual values and should be treated accordingly.

*All maps to be compared—except for *Fertilizer Application*, *Herbicide Use*, and *Family Corporate Farms*—are found on facing pages.

APPENDIX B: USGS Hydrologic Classification Scheme Definitions

A **region** is one of 21 major geographic areas within the U.S. or Caribbean area which contains either the drainage area of a major river or the combined drainage area of a series of rivers.

A **subregion** is a subdivision of a region and includes the area drained by a river system, a reach of a river and its tributaries in that reach, a closed basin, or a group of streams forming a coastal drainage area.

The **accounting units** nest within or are equivalent to the subregions. If the last two digits of this number are 00, the accounting unit and subregion are the same.

A **cataloging unit** is currently the smallest element in the hierarchy of hydrologic units, and represents part or all of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature. If the last two digits of this number are 00, the cataloging unit and accounting unit are the same. Cataloging units may also be referred to as watersheds.

Within the U.S. and Caribbean area there are 21 USGS hydrologic regions, 222 subregions, 352 accounting units, and 2150 cataloging units.

Within the UMR basin there are 14 subregions, 17 accounting units, and 131 cataloging units.

APPENDIX C: Geographic Data Files Used for this Report:

County Boundaries (countyp020)

Citation Information:

Originator: U.S. Geological Survey
Publication Date: 1998
Title: County Boundaries of the U.S.
Publication Information:
Publication Place: Reston, Virginia
Publisher: U.S. Geological Survey

Surface Hydrography (hydrogl020)

Citation Information:

Originator: U.S. Geological Survey
Publication Date: 199911
Title: Hydrography Features of the United States
Publication Information:
Publication Place: Reston, Virginia
Publisher: U.S. Geological Survey

USGS Hydrologic Unit Boundaries (hucs00m020)

Citation Information:

Originator: U.S. Geological Survey
Publication Date: 19990401
Title: 1:2,000,000-Scale Hydrologic Unit Boundaries
Edition: Version 2.0
Publication Information:
Publication Place: Reston, VA
Publisher: U.S. Geological Survey

Online Linkage: <http://www-atlas.usgs.gov/atlasftp.html>

Major Roads (roadtrl020)

Citation Information:

Originator: U.S. Geological Survey
Publication Date: 1997
Title: Major roads and trails of the U.S.
Publication Information:
Publication Place: Reston, Virginia
Publisher: U.S. Geological Survey

State Boundaries (statesp020)

Citation Information:

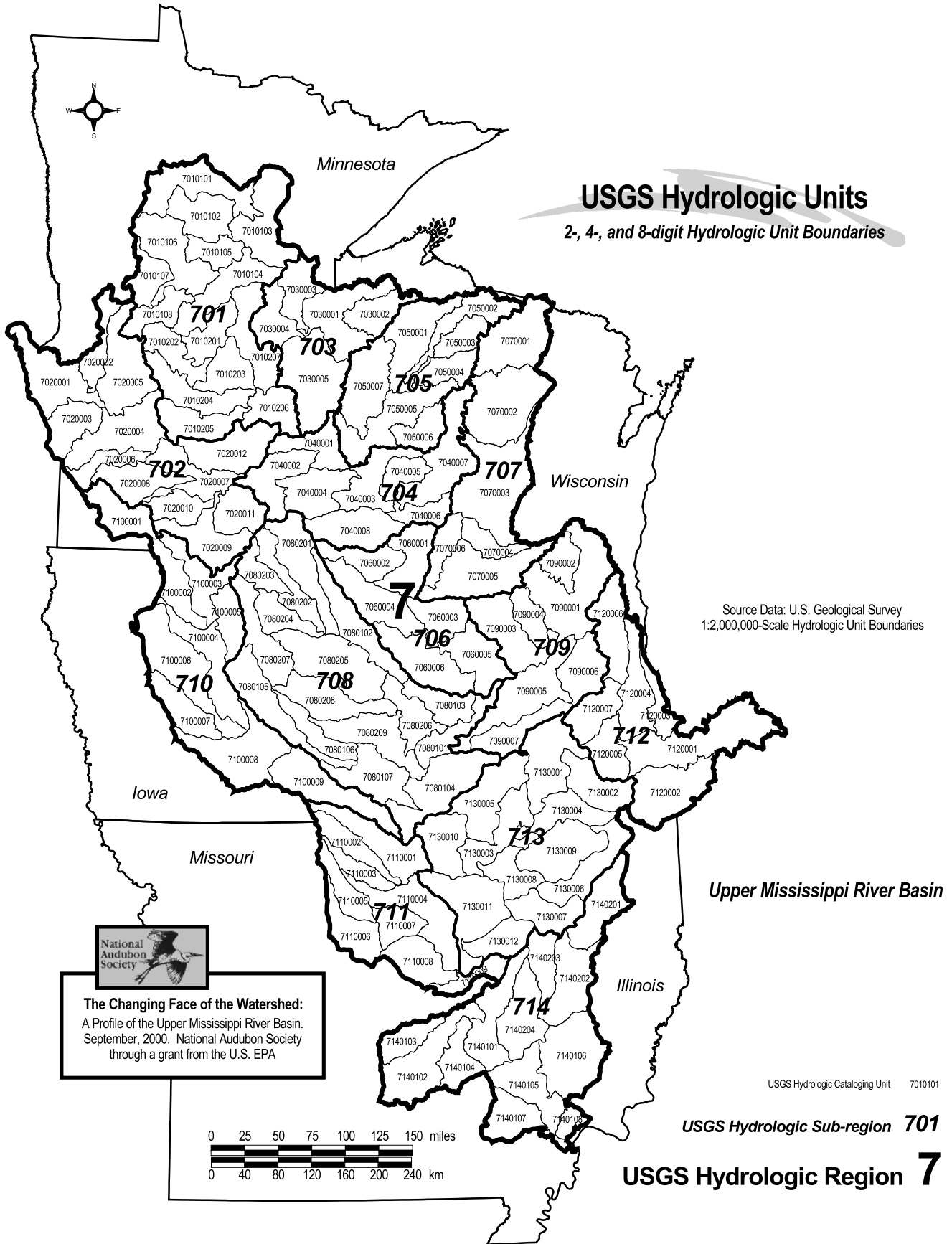
Originator: U.S. Geological Survey
Publication Date: 1997
Title: State Boundaries of the U.S.
Publication Information:
Publication Place: Reston, Virginia
Publisher: U.S. Geological Survey

Urban Areas (urbanap020)

Citation Information:

Originator: U.S. Geological Survey
Publication Date: 1998
Title: Urban Areas of the U.S.
Publication Information:
Publication Place: Reston, Virginia
Publisher: U.S. Geological Survey

APPENDIX D: USGS Hydrologic Unit Numbers



APPENDIX E: Numbering and Naming of UMR Basin Hydrologic Units (USGS classification system)

Region	Sub-region	Cataloging Unit	Cataloging Unit Name	Sub-region Name
7	701	7010101	Mississippi Headwaters. Minnesota.	Mississippi Headwaters
7	701	7010102	Leech Lake. Minnesota.	Mississippi Headwaters
7	701	7010103	Prairie-Willow. Minnesota.	Mississippi Headwaters
7	701	7010104	Elk-Nokasippi. Minnesota.	Mississippi Headwaters
7	701	7010105	Pine. Minnesota.	Mississippi Headwaters
7	701	7010106	Crow Wing. Minnesota.	Mississippi Headwaters
7	701	7010107	Redeye. Minnesota.	Mississippi Headwaters
7	701	7010108	Long Prairie. Minnesota.	Mississippi Headwaters
7	701	7010201	Platte-Spunk. Minnesota.	Mississippi Headwaters
7	701	7010202	Sauk. Minnesota.	Mississippi Headwaters
7	701	7010203	Clearwater-Elk. Minnesota.	Mississippi Headwaters
7	701	7010204	Crow. Minnesota.	Mississippi Headwaters
7	701	7010205	South Fork Crow. Minnesota.	Mississippi Headwaters
7	701	7010206	Twin Cities. Minnesota.	Mississippi Headwaters
7	701	7010207	Rum. Minnesota.	Mississippi Headwaters
7	702	7020001	Upper Minnesota. Minnesota, South Dakota.	Minnesota
7	702	7020002	Pomme De Terre. Minnesota.	Minnesota
7	702	7020003	Lac Qui Parle. South Dakota, Minnesota.	Minnesota
7	702	7020004	Hawk-Yellow Medicine. Minnesota.	Minnesota
7	702	7020005	Chippewa. Minnesota.	Minnesota
7	702	7020006	Redwood. Minnesota.	Minnesota
7	702	7020007	Middle Minnesota. Minnesota.	Minnesota
7	702	7020008	Cottonwood. Minnesota.	Minnesota
7	702	7020009	Blue Earth. Iowa, Minnesota.	Minnesota
7	702	7020010	Watonwan. Minnesota.	Minnesota
7	702	7020011	Le Sueur. Minnesota.	Minnesota
7	702	7020012	Lower Minnesota. Minnesota.	Minnesota
7	703	7030001	Upper St. Croix. Minnesota, Wisconsin.	St. Croix
7	703	7030002	Namekagon. Wisconsin.	St. Croix
7	703	7030003	Kettle. Minnesota.	St. Croix
7	703	7030004	Snake. Minnesota.	St. Croix
7	703	7030005	Lower St. Croix. Minnesota, Wisconsin.	St. Croix
7	704	7040001	Rush-Vermillion. Minnesota, Wisconsin.	Upper Mississippi-Black-Root
7	704	7040002	Cannon. Minnesota.	Upper Mississippi-Black-Root
7	704	7040003	Buffalo-Whitewater. Minnesota, Wisconsin.	Upper Mississippi-Black-Root
7	704	7040004	Zumbro. Minnesota.	Upper Mississippi-Black-Root
7	704	7040005	Trempealeau. Wisconsin.	Upper Mississippi-Black-Root
7	704	7040006	La Crosse-Pine. Minnesota, Wisconsin.	Upper Mississippi-Black-Root
7	704	7040007	Black. Wisconsin.	Upper Mississippi-Black-Root
7	704	7040008	Root. Iowa, Minnesota.	Upper Mississippi-Black-Root

7	705	7050001	Upper Chippewa. Wisconsin.	Chippewa
7	705	7050002	Flambeau. Michigan, Wisconsin.	Chippewa
7	705	7050003	South Fork Flambeau. Wisconsin.	Chippewa
7	705	7050004	Jump. Wisconsin.	Chippewa
7	705	7050005	Lower Chippewa. Wisconsin.	Chippewa
7	705	7050006	Eau Claire. Wisconsin.	Chippewa
7	705	7050007	Red Cedar. Wisconsin.	Chippewa
7	706	7060001	Coon-Yellow. Iowa, Minnesota, Wisconsin.	Upper Mississippi-Maquoketa-Plum
7	706	7060002	Upper Iowa. Iowa, Minnesota.	Upper Mississippi-Maquoketa-Plum
7	706	7060003	Grant-Little Maquoketa. Iowa, Wisconsin.	Upper Mississippi-Maquoketa-Plum
7	706	7060004	Turkey. Iowa.	Upper Mississippi-Maquoketa-Plum
7	706	7060005	Apple-Plum. Illinois, Iowa, Wisconsin.	Upper Mississippi-Maquoketa-Plum
7	706	7060006	Maquoketa. Iowa.	Upper Mississippi-Maquoketa-Plum
7	707	7070001	Upper Wisconsin. Michigan, Wisconsin.	Wisconsin
7	707	7070002	Lake Dubay. Wisconsin.	Wisconsin
7	707	7070003	Castle Rock. Wisconsin.	Wisconsin
7	707	7070004	Baraboo. Wisconsin.	Wisconsin
7	707	7070005	Lower Wisconsin. Wisconsin.	Wisconsin
7	707	7070006	Kickapoo. Wisconsin.	Wisconsin
7	708	7080101	Copperas-Duck. Illinois, Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080102	Upper Wapsipinicon. Iowa, Minnesota.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080103	Lower Wapsipinicon. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080104	Flint-Henderson. Illinois, Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080105	South Skunk. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080106	North Skunk. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080107	Skunk. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080201	Upper Cedar. Iowa, Minnesota.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080202	Shell Rock. Iowa, Minnesota.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080203	Winnebago. Iowa, Minnesota.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080204	West Fork Cedar. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080205	Middle Cedar. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080206	Lower Cedar. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080207	Upper Iowa. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon

7	708	7080208	Middle Iowa. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	708	7080209	Lower Iowa. Iowa.	Upper Mississippi-Iowa-Skunk-Wapsipinicon
7	709	7090001	Upper Rock. Illinois, Wisconsin.	Rock
7	709	7090002	Crawfish. Wisconsin.	Rock
7	709	7090003	Pecatonica. Illinois, Wisconsin.	Rock
7	709	7090004	Sugar. Illinois, Wisconsin.	Rock
7	709	7090005	Lower Rock. Illinois, Wisconsin.	Rock
7	709	7090006	Kishwaukee. Illinois, Wisconsin.	Rock
7	709	7090007	Green. Illinois.	Rock
7	710	7100001	Des Moines Headwaters. Minnesota.	Des Moines
7	710	7100002	Upper Des Moines. Iowa, Minnesota.	Des Moines
7	710	7100003	East Fork Des Moines. Iowa, Minnesota.	Des Moines
7	710	7100004	Middle Des Moines. Iowa.	Des Moines
7	710	7100005	Boone. Iowa.	Des Moines
7	710	7100006	North Raccoon. Iowa.	Des Moines
7	710	7100007	South Raccoon. Iowa.	Des Moines
7	710	7100008	Lake Red Rock. Iowa.	Des Moines
7	710	7100009	Lower Des Moines. Iowa, Missouri.	Des Moines
7	711	7110001	Bear-Wyaconda. Illinois, Iowa, Missouri.	Upper Mississippi-Salt
7	711	7110002	North Fabius. Iowa, Missouri.	Upper Mississippi-Salt
7	711	7110003	South Fabius. Missouri.	Upper Mississippi-Salt
7	711	7110004	The Sny. Illinois, Missouri.	Upper Mississippi-Salt
7	711	7110005	North Fork Salt. Missouri.	Upper Mississippi-Salt
7	711	7110006	South Fork Salt. Missouri.	Upper Mississippi-Salt
7	711	7110007	Salt. Missouri.	Upper Mississippi-Salt
7	711	7110008	Cuivre. Missouri.	Upper Mississippi-Salt
7	711	7110009	Peruque-Piasa. Illinois, Missouri.	Upper Mississippi-Salt
7	712	7120001	Kankakee. Illinois, Indiana, Michigan.	Upper Illinois
7	712	7120002	Iroquois. Illinois, Indiana.	Upper Illinois
7	712	7120003	Chicago. Illinois, Indiana.	Upper Illinois
7	712	7120004	Des Plaines. Illinois, Wisconsin.	Upper Illinois
7	712	7120005	Upper Illinois. Illinois.	Upper Illinois
7	712	7120006	Upper Fox. Illinois, Wisconsin.	Upper Illinois
7	712	7120007	Lower Fox. Illinois.	Upper Illinois
7	713	7130001	Lower Illinois-Senachwine Lake. Illinois.	Lower Illinois
7	713	7130002	Vermilion. Illinois.	Lower Illinois
7	713	7130003	Lower Illinois-Lake Chautauqua. Illinois.	Lower Illinois
7	713	7130004	Mackinaw. Illinois.	Lower Illinois
7	713	7130005	Spoon. Illinois.	Lower Illinois
7	713	7130006	Upper Sangamon. Illinois.	Lower Illinois
7	713	7130007	South Fork Sangamon. Illinois.	Lower Illinois
7	713	7130008	Lower Sangamon. Illinois.	Lower Illinois
7	713	7130009	Salt. Illinois.	Lower Illinois
7	713	7130010	La Moine. Illinois.	Lower Illinois

7	713	7130011	Lower Illinois. Illinois.	Lower Illinois
7	713	7130012	Macoupin. Illinois.	Lower Illinois
7	714	7140101	Cahokia-Joachim. Illinois, Missouri.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140102	Meramec. Missouri.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140103	Bourbeuse. Missouri.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140104	Big. Missouri.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140105	Upper Mississippi-Cape Girardeau. Illinois, Missouri.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140106	Big Muddy. Illinois.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140107	Whitewater. Missouri.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140108	Cache. Illinois.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140201	Upper Kaskaskia. Illinois.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140202	Middle Kaskaskia. Illinois.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140203	Shoal. Illinois.	Upper Mississippi-Kaskaskia-Meramec
7	714	7140204	Lower Kaskaskia. Illinois.	Upper Mississippi-Kaskaskia-Meramec

NOTE TO READER:

IF YOU DOWNLOADED THIS REPORT FROM THE INTERNET OR HAVE RECEIVED AN ELECTRONIC VERSION BY ANOTHER MEANS, IT IS NECESSARY TO MANUALLY INSERT THE FOLLOWING INFORMATION BETWEEN THE APPROPRIATE MAPS.

FOLDING AND/OR CUTTING THE PAGE IN HALF VERTICALLY WILL ALLOW EASIER VIEWING OF EACH SET OF FACING MAPS.

The information on each of these inserts will assist you in interpreting and understanding the data presented.

Map 4: Land in Farms by County
Map 5: Land in Farms by
Cataloging Unit

INTERPRETATION

The darkest areas on the map indicate the most intensively farmed land areas in the UMR basin. Compare these areas to the Figure 1: Potential Natural Vegetation. Notice how the most intensively farmed areas were once dominated by prairie, savanna and forested prairie landscapes.

IMPLICATIONS

Counties and/or hydrologic units (watersheds) that have a high percentage of their land area under cultivation also have the most altered pre-settlement landscapes. Run-off and erosion of topsoil are concerns in these areas. Best management agricultural practices need to be implemented in these areas to counteract the loss of soil-holding and nutrient-absorbing prairie grasses. Wetland losses in these areas are generally extremely high, with very few of the original wetlands remaining to act as sediment and nutrient traps, and moderators of river flows.

Map 6: Farm Size by County
Map 7: Farm Density by County

INTERPRETATION

Areas with the largest average farm size are generally correspond with those areas in which the total percentage of land area farmed (previous Map 4) is the highest (i.e. southwest Minnesota, northeast and central Iowa, and central Illinois).

The farm density map provides another way of looking at farm size; the larger the average farm size, the fewer farms per square mile.

IMPLICATIONS

For the greatest impact, educational and land stewardship messages should reflect the character of the farming operations within a given watershed. Operators of very large farms have needs that are different from small farmers and so approach their farming operations quite differently.

Map 8: Large Farms, 1000+ Acres by County

Map 9: Percentage of Large Farms, 1000+ Acres by County

INTERPRETATION

These two maps show where the largest farms are generally concentrated. Table 2, Average Farm Size in the UMR Five State Basin, indicates a constantly increasing average farm size. Much of this growth in farm size is occurring among farms that are already quite large (i.e. 500 or more acres).

IMPLICATIONS

Knowing how many exceptionally large farms are located in a given watershed has implications for how educational and informational campaigns should be conducted. For example, brochures and reports that use images of farming activities that are not characteristic of farming operations in the watershed may be taken less seriously by farm operators. If the images portray farm equipment (e.g. open tractors pulling 4 row planters or 4 row cultivators) no longer in use by the vast majority of farming operations, farm operators may feel the proponents of conservation techniques are “out of touch”. The operator will have a difficult time identifying with the message being communicated because it does not represent his/her current state of farming operations.

Map 10: Farmland Consolidation by County

Map 11: Farmland Consolidation by Cataloging Unit

INTERPRETATION

These two maps can be used to locate the concentrations of farming operations 1000 or more acres in size. High percentages of farmland in farms 1000+ acres in size equate to just a few farm operators controlling a large portion of a given county or watershed.

IMPLICATIONS

Knowing where the concentrations of large scale farms are occurring and how much land is being controlled by just a few farm operators has implications for how effective a personal, one-on-one contact campaign with farm operators might be. In watersheds where a large percentage of land area is controlled by a relatively few farmers, this translates into just a few personal contacts that, in turn, maximizes the amount of land area that could be potentially affected by farming operation changes. The manpower and time needed to contact and develop relationships with, for example, 100 farmers controlling 50 percent of the farmland area in a watershed is much less than the manpower and time needed to reach the remaining 200 farmers who control the other 50 percent.

Map 12: Fertilizer Application by County, 1954

Map 13: Fertilizer Application by County, 1997

INTERPRETATION

These two maps clearly show the growth in commercial fertilizer application across the UMR basin. 1954 was the first year that the Census of Agriculture recorded commercial fertilizer use. Comparing the two maps, growth in fertilizer use seems to have grown outward from, and remains concentrated around, those areas where commercial fertilizer use was first adopted by farm operators.

IMPLICATIONS

Certainly not all farmers misapply commercial fertilizer. However, excessive rainfall events and/or excessive fertilizer use (as well as other factors) can increase the likelihood that nutrient-laden runoff will enter streams and rivers, as well as groundwater. Excessive nitrogen runoff has been linked to the presence of the hypoxia zone in the Gulf of Mexico. These maps can be used to identify areas where commercial fertilizer use is concentrated. Special attention can then be paid to assuring that fertilizer use is within guidelines for healthy crops and protection of water resources. Additionally, if land stewardship efforts are minimal at best within these areas of high commercial fertilizer use, efforts should be undertaken to correct the situation.

**Map 14: Fertilizer Application by
Cataloging Unit, 1954**

**Map 15: Fertilizer Application by
Cataloging Unit, 1997**

INTERPRETATION

These two maps are analogous to the previous two maps, except that the data is displayed by hydrologic cataloging unit (watershed). Here again, growth in fertilizer use seems to have grown outward from, and remains concentrated around, those areas where commercial fertilizer use was first adopted by farm operators.

IMPLICATIONS

See implications from the previous two maps 12 and 13.

Map 16: Herbicide Use by County, 1964

Map 17: Herbicide Use by County, 1997

INTERPRETATION

These two maps clearly show the growth in herbicide application across the UMR basin. 1964 was the first year that the Census of Agriculture recorded herbicide use. Comparing the two maps, growth in herbicide use seems to have begun in two separate regions of the UMR basin and grown outward from there. Note that the early adopters of herbicide use are also within the same areas in which the largest percentage of land area in farms 1000+ acres (Map 10) also occurs. Also note that the current use of herbicide remains concentrated within these same areas.

IMPLICATIONS

Certainly not all farmers misapply herbicides. Excessive rainfall events and/or excessive herbicide use (as well as other factors) can increase the likelihood of polluted runoff entering streams and rivers, as well as groundwater. These maps can be used to identify areas where herbicide use is concentrated and where special attention should be paid to assuring that use is within guidelines for healthy crops and protection of water resources. Additionally, if educational and informational land stewardship efforts are lacking within these high-use herbicide use areas, efforts should be undertaken to correct the situation.

**Map 18: Herbicide Use by
Cataloging Unit, 1964**

**Map 19: Herbicide Use by
Cataloging Unit, 1997**

INTERPRETATION

These two maps clearly show the growth in herbicide application across the UMR basin, based on a hydrologic cataloging unit (watershed) basis. 1964 was the first year that the Census of Agriculture recorded herbicide use. Comparing the two maps, growth in herbicide use seems to have begun in two separate regions of the UMR basin and grown outward from there. Note that the early adopters of herbicide use are also within the same areas in which the largest percentage of land area in farms 1000+ acres (Map 10) also occurs. Also note that the current use of herbicide remains concentrated within these same areas as well.

IMPLICATIONS

Certainly not all farmers misapply herbicides. Excessive rainfall events and/or excessive herbicide use (as well as other factors) can increase the likelihood of polluted runoff entering streams and rivers, as well as groundwater. These maps can be used to identify areas where herbicide use is concentrated and where special attention should be paid to assuring that use is within guidelines for healthy crops and protection of water resources. Additionally, if educational and informational land stewardship efforts are minimal at best within these high-use herbicide use areas, efforts should be undertaken to correct the situation.

Map 20: CRP/WRP Participation by County

Map 21: CRP/WRP Participation by Cataloging Unit

INTERPRETATION

Notice that the highest CRP/WRP participation rates are in areas where the percentage of total land farm in farms (Map 4 or 5) is 83% or less. Areas with the highest percentage of total land in farms have lower participation rates.

IMPLICATIONS

From a water resource management perspective, an analysis of factors causing the above phenomenon is worth exploring further. Is the message to participate in the program not being received or is the land just too valuable to be removed from active agricultural production?

**Map 22: Family Corporate Farms
by County, 1987**

**Map 23: Family Corporate Farms
by County, 1997**

INTERPRETATION

These two maps show the percentage of total land area under family farm corporations in 1987 and 1997. Notice the steady growth in land under family corporate farm ownership over the past decade.

IMPLICATIONS

As more family corporations are formed and more land brought under their control, targeted land stewardship and water resource protection messages should be tailored to this unique farm management system. In this case, making arrangements to augment personal, one-on-one contacts, paying special attention to family corporation operators as a *group* would be worthwhile. Resource managers would learn how to better serve family corporation decision-making and better affect positive land stewardship actions.

**Map 24: Family Corporate Farms
by Cataloging Unit, 1987**

**Map 25: Family Corporate Farms
by Cataloging Unit, 1997**

INTERPRETATION

Similar data as displayed on maps 22 and 23. Data is displayed here by cataloging unit rather than county. Notice the steady growth in land under family corporate farm ownership over the past decade.

IMPLICATIONS

Similar to maps 22 and 23, as more family corporations are formed and more land brought under their control, targeted land stewardship and water resource protection messages should be tailored to this unique farm management system. In this case, making arrangements to augment personal, one-on-one contacts paying special attention to family corporation operators as a *group* would be worthwhile. Resource managers would learn how to better serve family corporation decision-making and better affect positive land stewardship actions.

Map 26: Non-Family Corporate Farms by County, 1997

Map 27: Farming as Principal Occupation by County, 1997

INTERPRETATION

Non-Family Corporate Farms, Map 26, Farmland under the control of corporations other than family farm corporations is relatively small.

Principal Occupation, Map 27: Notice that the highest percentage of full-time farmers coincides with the areas of the UMR basin that also have the largest farm sizes (Map 6) and highest percentage of total land area in farms (Map 4).

IMPLICATIONS

Non-Family Corporate Farms, Map 26: The total number of farms and the land under non-family corporate control is much less than most people (especially urban dwellers) understand or believe. Many states prohibit agri-business corporations from owning land.

Principal Occupation, Map 27: Part-time farmers conduct their farming operations from entirely different perspectives than large-scale, full-time farmers. Special attention should be paid to the needs and reasons each group has for being in farming so that informational and educational messages are best managed and delivered.

**Map 28: Farmers Age 65 and Older
by County, 1997**

**Map 29: Farmers Age 65 and Older
by Cataloging Unit, 1997**

INTERPRETATION

Note the concentrations of older farm operators in northeast Missouri and eastward into Illinois. Notice that the region of the UMR basin most intensively farmed (Map 6) also has the fewest number of farm operators age 65 years and older.

IMPLICATIONS

Farm operators age 65 and older are likely to retire within a few short years. This provides an opportunity and a challenge. The opportunity: retiring farmers may be more willing to put land in permanent conservation easements as a “legacy” for the future. The challenge: new farm operators (after the farm has changed hands) may need new or additional services in the form of conservation and land stewardship education. Watershed managers should make an effort to personally contact soon-to-be retiring farmers to assure successful continuation of conservation efforts.

**Map 30: Swine Density by County,
1997**

**Map 31: Turkey Density by County,
1997**

INTERPRETATION

Large concentrations of animals generally indicate that confined animal feeding operations are being conducted.

IMPLICATIONS

Confined animal operations are generators of massive amounts of manure wastes. Safe and effective manure management methods are necessary to assure that water quality is not compromised and odor is controlled. Confined animal operations near population centers will likely find themselves embroiled in public debate over odors that are a result of the operation.

Map 32: Poultry Density by County, 1997

INTERPRETATION

Large concentrations of animals generally indicate that confined animal feeding operations are being conducted.

IMPLICATIONS

Confined animal operations are generators of massive amounts of manure wastes. Safe and effective manure management methods are necessary to assure that water quality is not compromised and odors controlled. Confined animal operations near population centers will likely find themselves embroiled in public debate over odors that are a result of the operation.