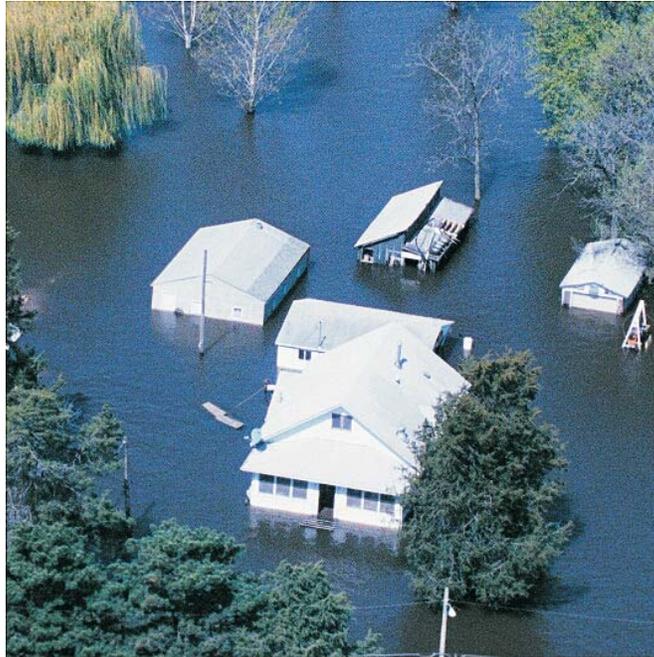


Upper Mississippi River

C O M P R E H E N S I V E P L A N



Existing Economic Conditions

T E N N E S S E E V A L L E Y A U T H O R I T Y



Upper Mississippi River

# Comprehensive Plan

Existing Economic Conditions

Prepared for  
**Rock Island District**  
U.S. Army Corps of Engineers

**M A Y 2 0 0 4**

Prepared by  
**Navigation & Hydraulic Engineering**

**T E N N E S S E E V A L L E Y A U T H O R I T Y**

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John P. Carr

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# 1

## Upper Mississippi Study Area

The purpose of this study is to provide the framework for understanding the relative importance and significance of the economic impacts of various proposed actions within the study area.

The study area is large, as shown in Figure 1–1, stretching along the Mississippi River from Minneapolis-St. Paul to the southeast corner of Missouri past St. Louis as well as along the Illinois River and up to counties in Illinois adjacent to the Chicago metropolitan area. The area is also diverse, ranging from large metropolitan areas to highly rural areas.

This study area is divided into four subareas, each including the counties around a specific river segment. As shown in Figure 1–2, some subareas within the study area overlap. These subareas are as follows:

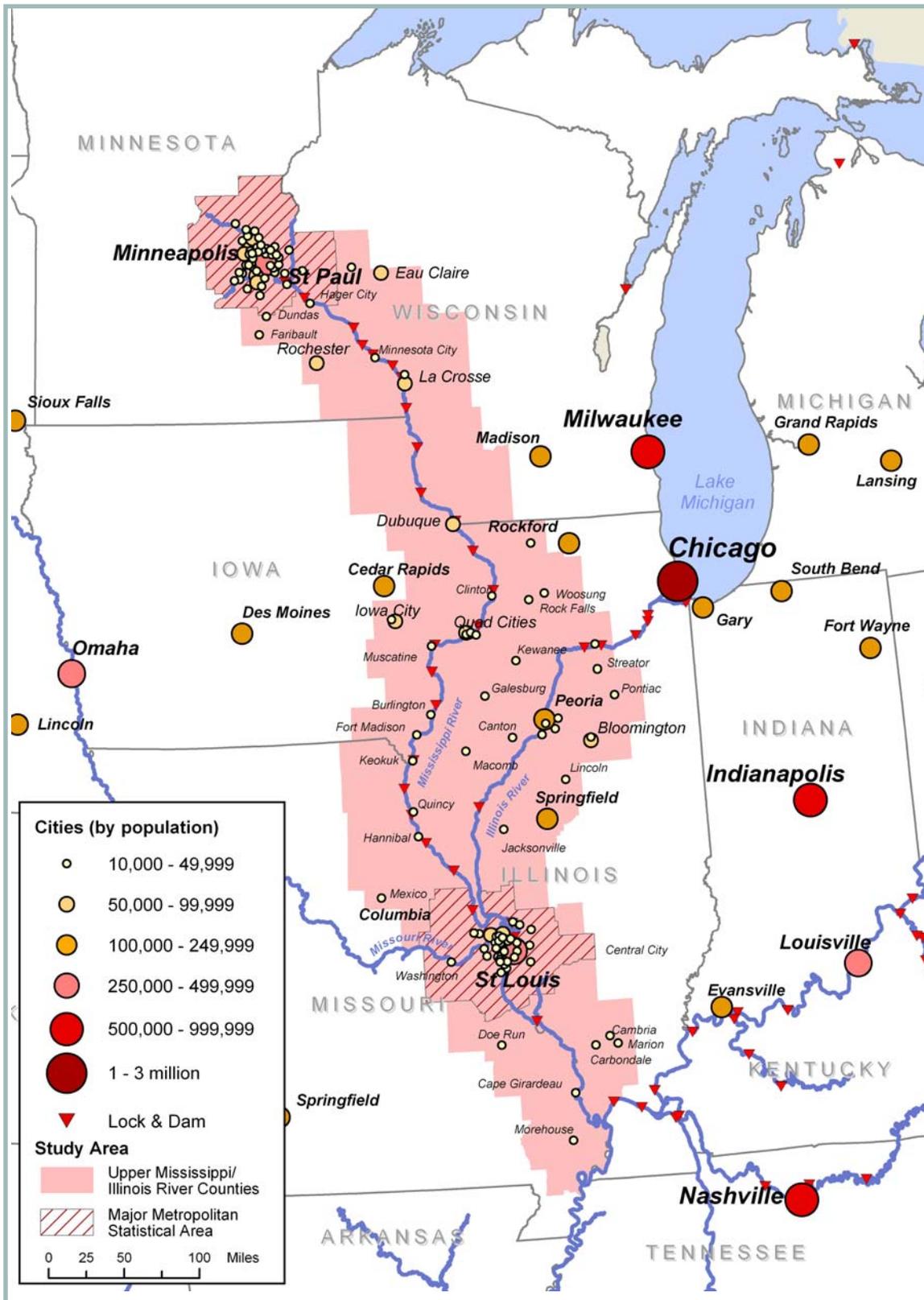
- Upper Subarea between Anoka, Minnesota, and Dubuque, Iowa
- Middle Subarea between Dubuque, Iowa, and Quincy, Illinois
- Lower Subarea between Quincy, Illinois, and Thebes, Illinois
- Illinois Subarea Grafton, Illinois, and the Des Plaines/Kankakee confluence

In general, the geographic area analyzed for each of these subareas is two counties around each of these river stretches. However, the Chicago metropolitan area was excluded entirely in order to provide a more meaningful description of the economy of the area immediately along the waterway.

The study area is located in the agricultural heart of the nation, part of the Interior Plains region. Two of the nation's largest population concentrations are in the area: St. Louis on the south and Minneapolis-St. Paul on the north. Chicago lies to the east, adjacent to the study area.

The terrain of this area is generally flat-to-rolling, but with varied topography. However, the modest relief of the plains occasionally gives way to loess hills and karst topography along the Mississippi River, low moraine ridges in some areas, and gentle slopes and hills created by rivers and streams. In the northern part of the study area, some landscape features were created by the actions of glacial forces. This area has productive soils that generally formed under conditions of moderate moisture under forest cover, although some in the area formed under grasses. Only relatively modest farming practices are required to retain the productivity of these soils. As a result, much of this area is well suited for farming.

Figure 1-1: The Study Area





# 2

## Demographics of the Study Area

In 2000, the population in the study area was over 9.7 million, an increase of 8.2 percent from 1990 as shown in Figures 2–1 and 2–2 and Table A–1. Population in the subareas varied in 2000 from about 1.5 million in the Middle Subarea to almost 4.1 million in the Upper Subarea. Growth in the study area was lower than the national rate of 13.2 percent and also lower than all five of the study area states except Iowa. With growth varying widely between the subareas, the Upper Subarea grew 14.1 percent with the total population being almost 4.1 million. Other subareas grew much more slowly, well below the study area, the nation, and any of the five study-area states.

As defined by the U.S. Census Bureau, the area is more rural than the nation with 24.3 percent of its population living in rural areas, compared to 21 percent nationally as shown in Figures 2–3, 2–4, and in Table A–2. Again, these rates varied greatly among the subareas, ranging from 39.8 percent rural in the Middle Subarea to 19.7 percent rural in the Illinois Subarea.

The U.S. Census Bureau classifies as rural all population not located in an urbanized area or an urban cluster. Urban areas and urban clusters encompass densely settled territory, which consists of core areas (Census blocks or block groups) with a population density of at least 1,000 persons per square miles and surrounding Census blocks with an overall density of at least 500 persons per square mile. Under certain conditions, less densely settled territory may be part of an urban area or urban cluster. However, the population in such a territory would generally be small.

Demographically, the study area is less diverse than the nation as shown in Figures 2–5, 2–6, and Table A–3. The nonwhite population in the study area is 13.2 percent of the total, considerably lower than the nation's 24.9 percent. As shown in Figure 2–5, the Hispanic or Latino population was only 2.4 percent of the total, compared to 12.5 percent nationally. High school graduation levels for the population 25 and older are higher than the national average, 85.4 percent of the population being high school graduates compared to 80.4 percent nationally. Again, the subareas varied widely, with the nonwhite population ranging from 6 percent of the total in the Middle Subarea to 18.1 percent in the Lower Subarea. The Hispanic or Latino population ranged from 1.4 percent in the Lower Subarea to 3.4 in the Middle Subarea. The percent who were high school graduates ranged from 81.5 percent in the Lower Subarea to 89.2 percent in the Upper Subarea.

The relative size of nonwhite and Hispanic populations varies widely among counties in the study area and in each of the subareas, as can be see in Figures 2–6 and 2–7.

The population of the study area is very similar to the nation in its age distribution, but has a slightly smaller share of persons in the 25 through 64 age ranges, offset by slightly larger shares in the 18 to 24 and the 65 and older groups as shown in Figure 2–9 and Table A–4. However, the Upper Subarea follows a different pattern, with higher than average population in all age groups below 50 years of age and lower than average for 50 and older age groups. In contrast, the other three subareas have higher than average shares in the 50 and older ranges and lower than average in most of the under 50 age groups.

Figure 2–1: Total Population by County in the Study Area in 2000

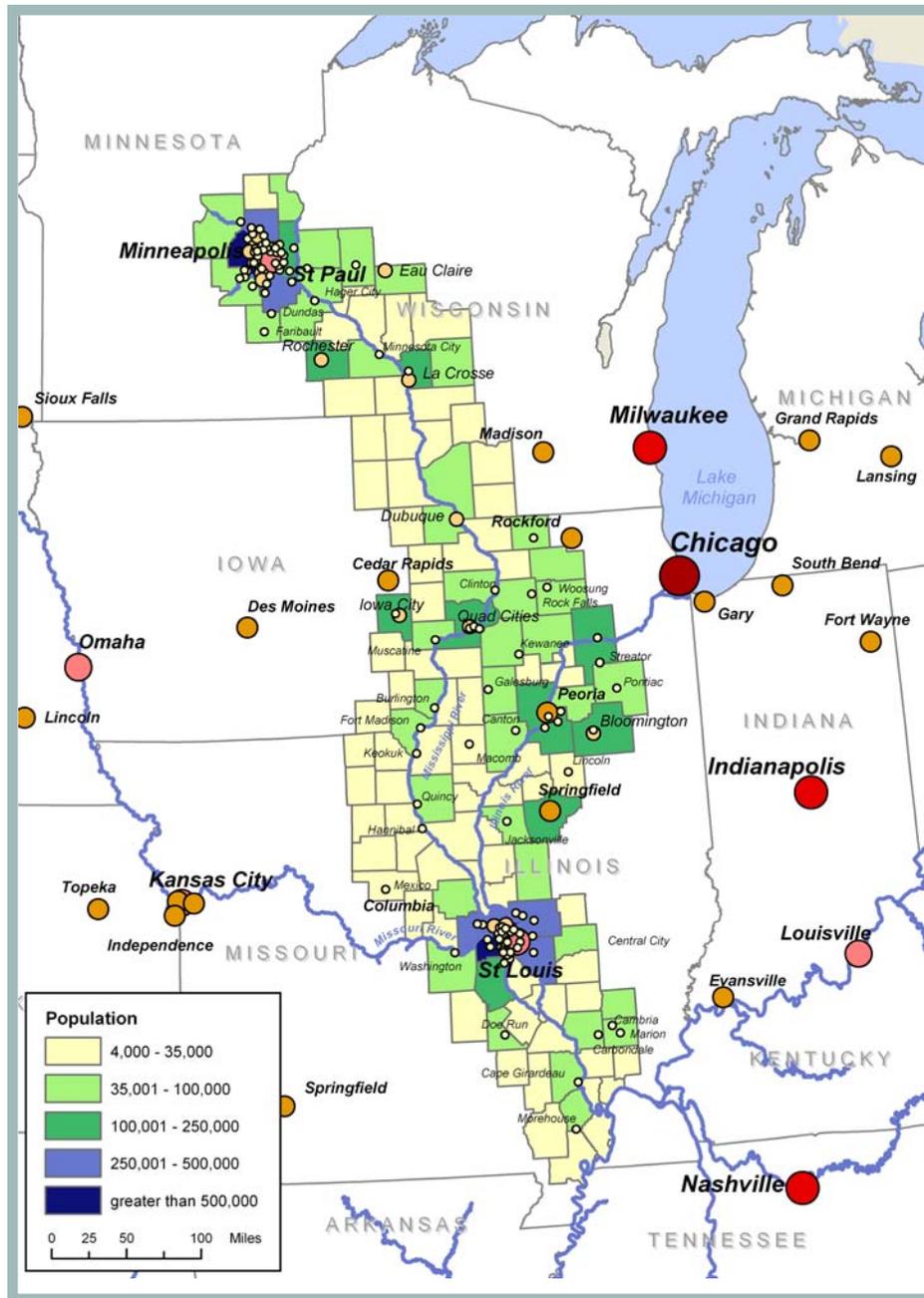


Figure 2–2: Population in 2000

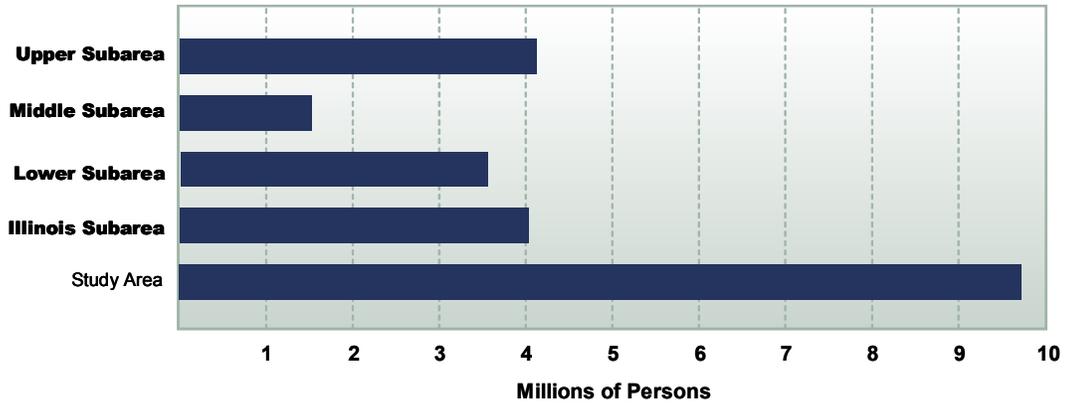


Figure 2–3: Population Increase, 1990–2000

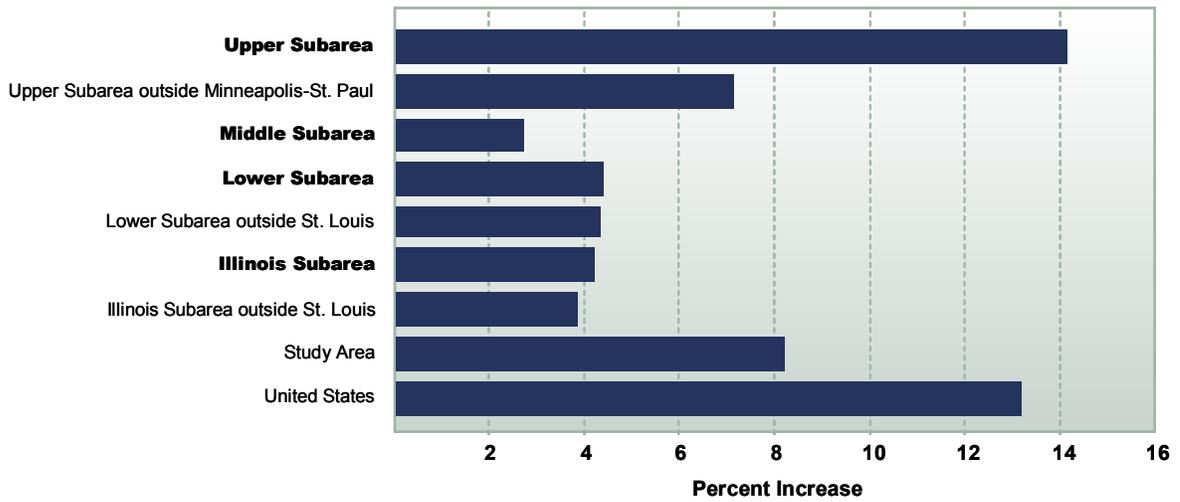
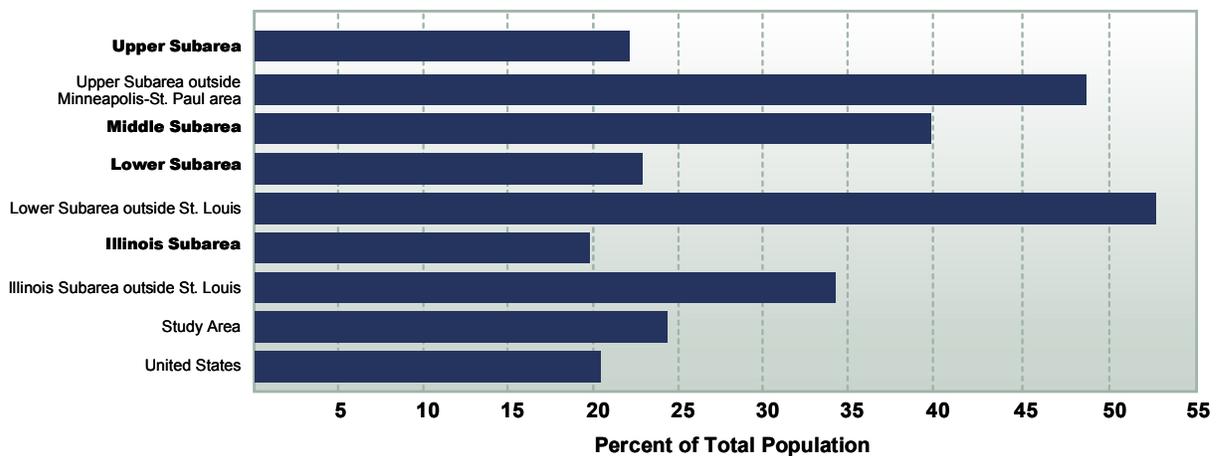


Figure 2–4: Rural Population (Percent of Total) in 2000



**Figure 2–5: Minority Population (Percent of Total) in 2000**

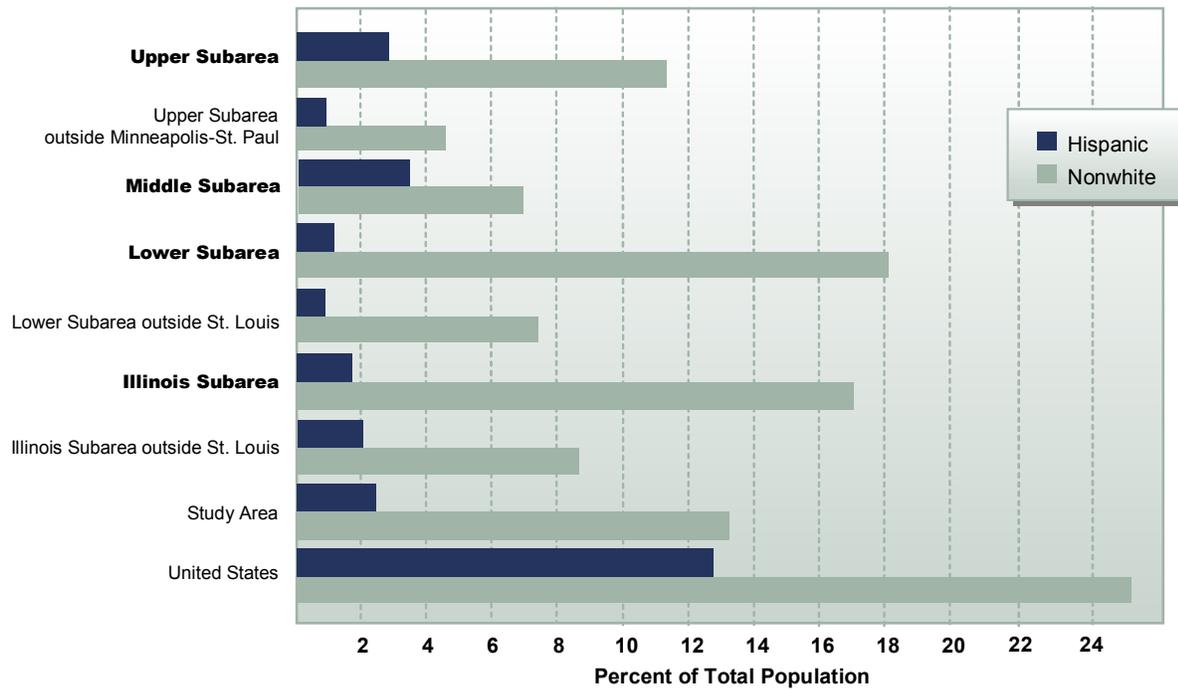


Figure 2-6: Nonwhite Population (Percent of Total) in 2000

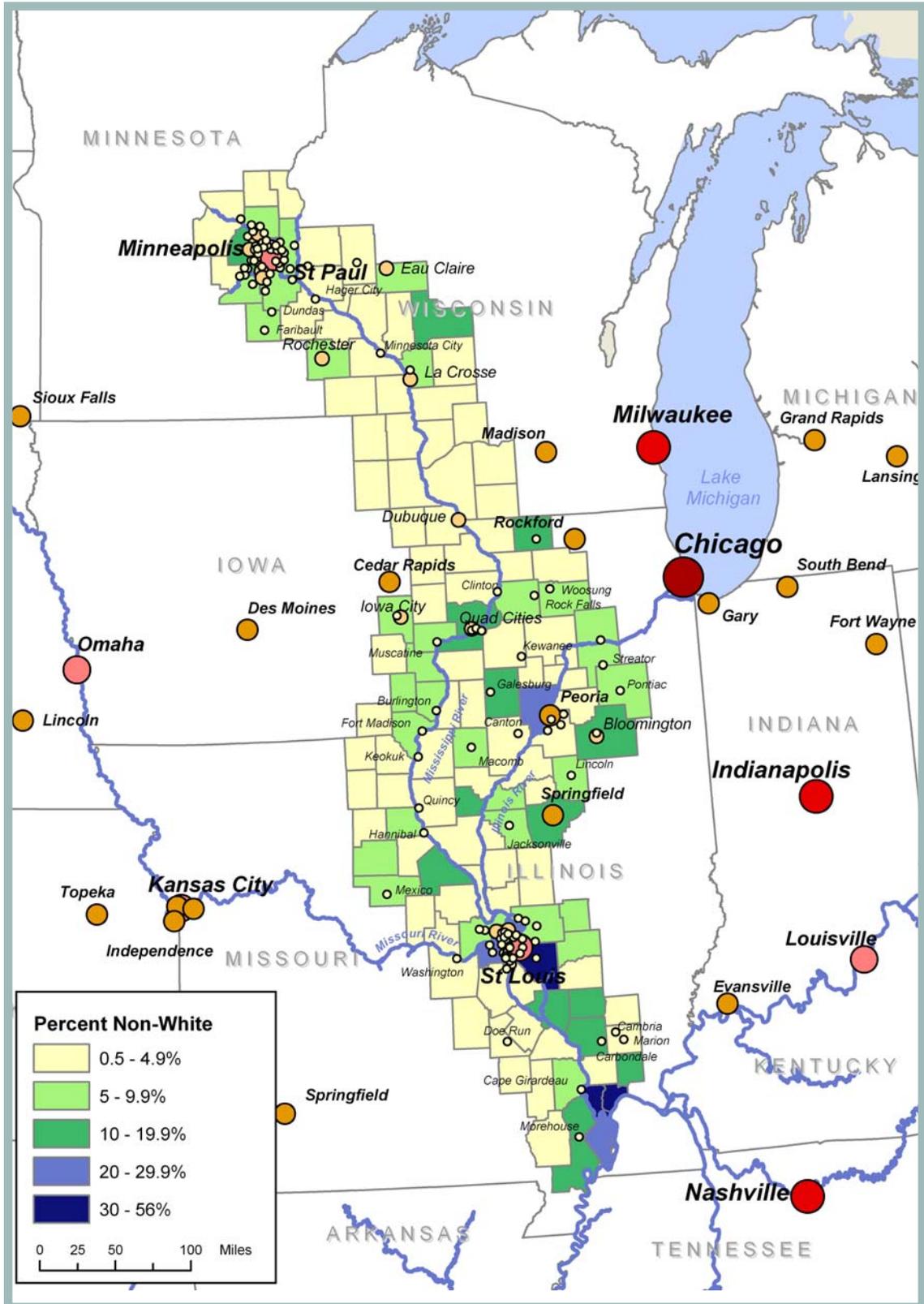


Figure 2-7: Hispanic Population (Percent of Total) in 2000

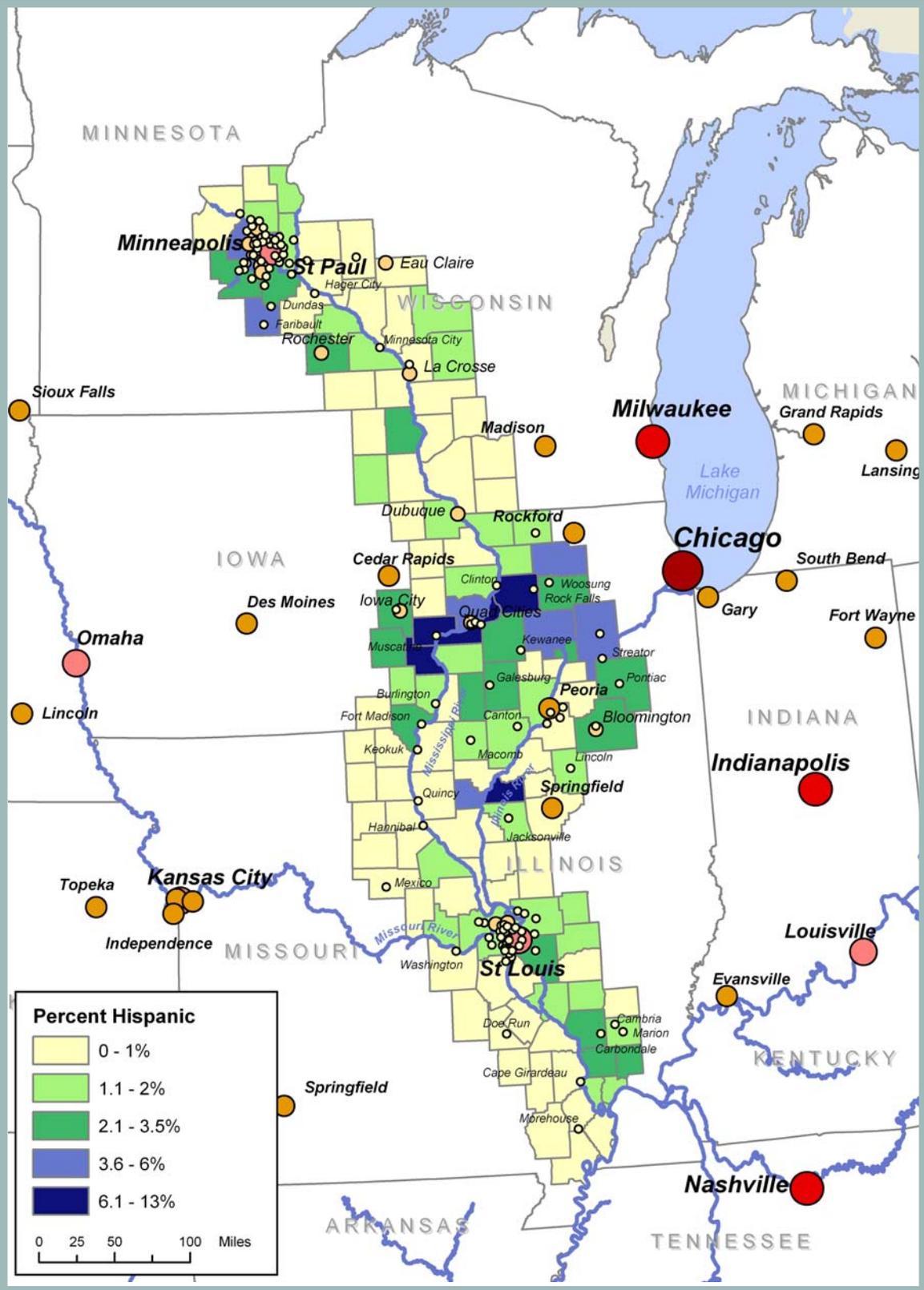


Figure 2-8: High School Graduates in 2000

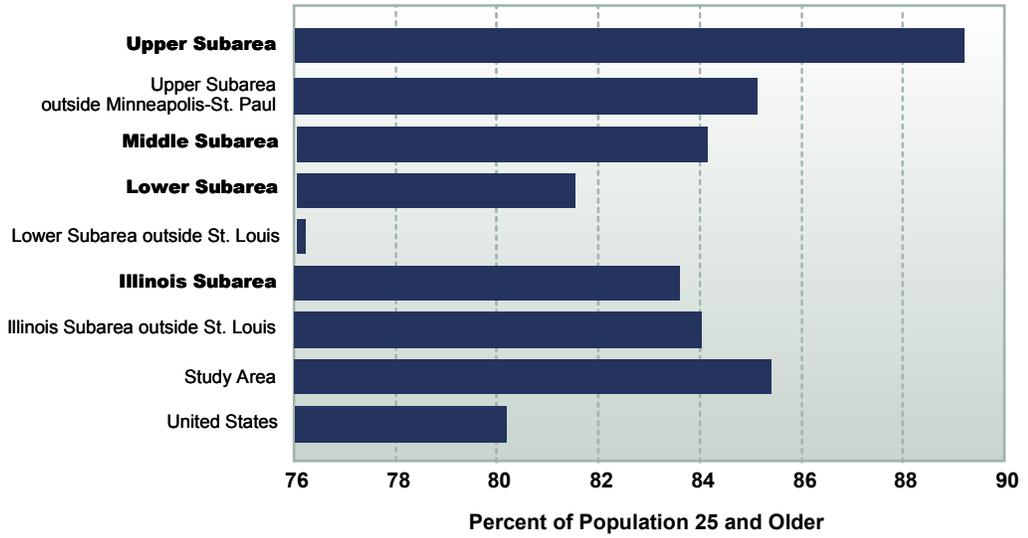
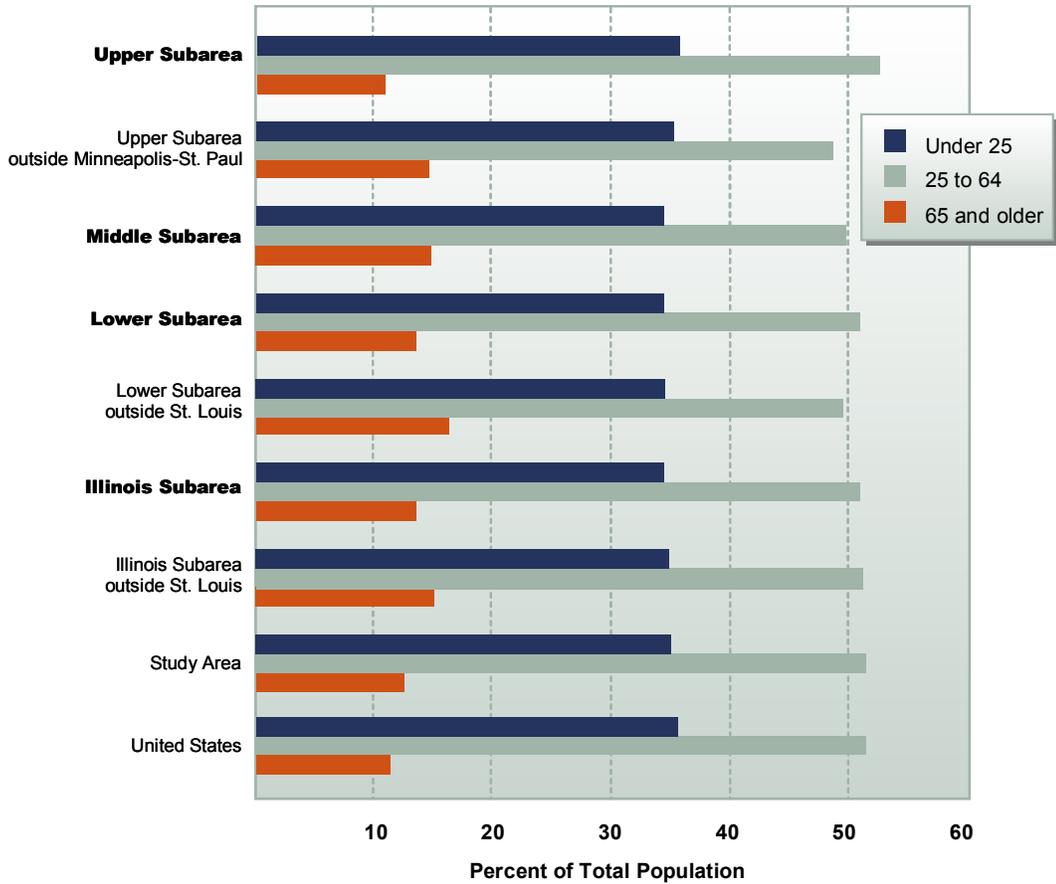


Figure 2-9: Population by Age in 2000

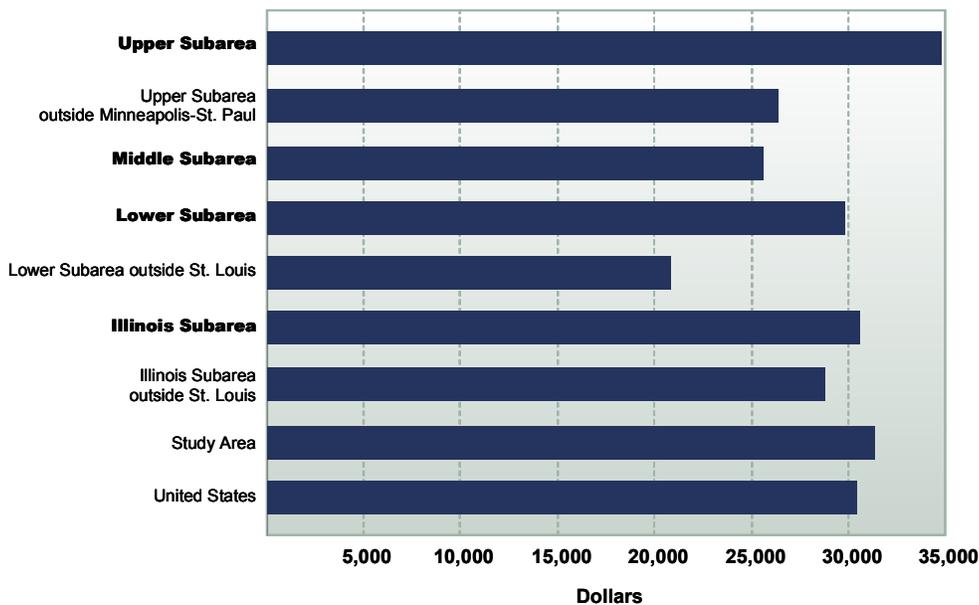


# The Economy of the Study Area

## Income and Poverty

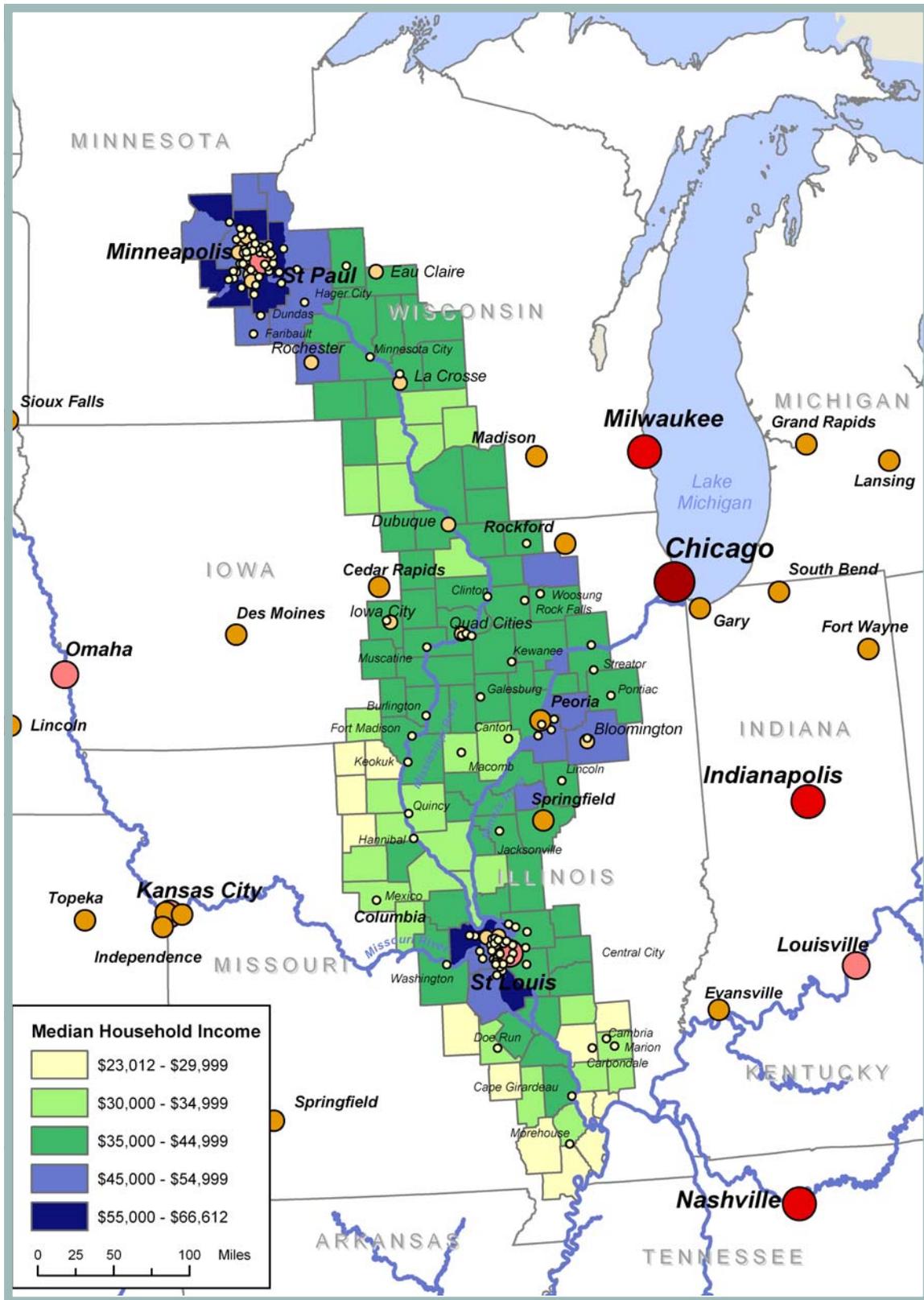
Per capita personal income within the study area in 2001 was \$31,376, close to the national average, exceeding it by about 3 percent as shown in Figures 3–1, 3–2, and Table A–5. However, there is significant variation among the subareas, with the Upper Subarea highest at \$34,783, more than 14 percent higher than the national average. On the other hand, the Middle Subarea was much lower, \$25,604, almost 16 percent lower than the national average. The two other subareas were close to the national average, with the Lower Subarea less than 2 percent below the national average and the Illinois Subarea less than 1 percent higher. Median household income for 1999, based on the 2000 Census of Population, displays a similar pattern as compared to the nation. Household incomes vary widely among counties, as shown in Figure 3–2.

Figure 3–1: Per Capita Income in 2001

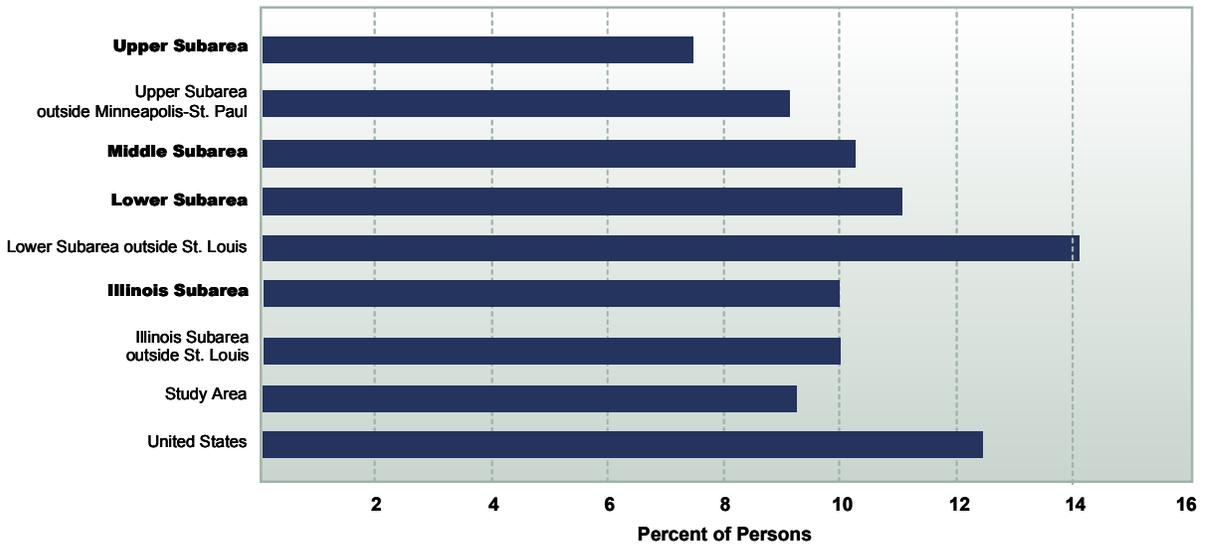


Poverty levels in the study area in 1999 were lower than the national average, 9.2 percent in the study area and 12.4 nationally as shown in Figures 3–3, 3–4, and Table A–5. The Upper Subarea had the lowest

Figure 3–2: Median Household Income in 1999



**Figure 3–3: Persons Below Poverty Level (Percent of Total Population) in 1999**



poverty level at 7.4 percent of the population. However, all of the subareas had poverty rates lower than the national average, with the Lower Subarea the highest at 11 percent. Poverty levels vary widely among counties similar to household income as shown in Figure 3–4.

### Unemployment Rates

Unemployment rates in the study area and in all of the subareas were lower than the national average in 2002 as shown in Figure 3–5, and Table A–5. The unemployment rate in the study area was 4.9 percent, compared to the national rate of 5.8 percent. The unemployment rate in the Upper Subarea was only 4.4 percent, while the unemployment rate in the other subareas ranged from 5.2 to 5.4 percent. The total labor force in the study area was about 5.4 million as shown in Table A–5, over 3.7 percent of the nation’s labor force. The Upper Subarea had a labor force of almost 2.5 million, and the Illinois Subarea slightly less at 2.1 million. The others were smaller with 1.8 million in the Lower Subarea and 800,000 in the Middle Subarea.

## Employment and Earnings

Both farming and manufacturing are relatively more important to the study area’s economy than to the national economy. Nationally, 1.8 percent of total full-time and part-time employment (self-employed and wage and salary employees) was in farming in 2001 as shown in Figure 3–6 and Table A–6. In contrast, farming accounted for 2.6 percent of total employment in the study area. In the Middle Subarea, farming accounted for 5.8 percent of total employment. However, in the Illinois Subarea, it was only 1.9 percent, essentially the same as the national average. In the Upper and Lower Subareas farming accounted for 2.4 and 2.2 percent respectively. Figure 3–7 shows percent of work force in farming by county within the study area.

Proprietors (self-employed farmers) account for a larger share of farm employment in the study area than in the nation as a whole. Nationally, almost 72 percent of persons who work on farms are proprietors (as opposed to employees), while almost 84 percent in the study area are proprietors. This share is similar in all of the subareas, ranging from slightly more than 82 percent in the Illinois Subarea to slightly more than 86 percent in the Middle Subarea.

As shown in Figure 3–6, manufacturing accounted for 11.3 percent of total full-time and part-time employment in the study area, compared to 10.2 percent in the nation. The Middle Subarea also had the largest share of its employment in manufacturing, as it did in farming, 14.3 percent. The Upper Subarea had 11.6 percent, only slightly higher than the study area average. In manufacturing, the Lower and Illinois Subareas were more similar to the national pattern with 10.4 and 10.2 percent respectively.

Average earnings in both farming and manufacturing were below the national average. In the study area, average earnings in farming were only \$8,016, less than 62 percent of the national average. The highest average earnings in the study area were in the Middle Subarea, with an average of \$10,019, about 77 percent of the national average, followed closely by the Illinois Subarea, at \$9,927, about 76 percent of the national average. Average farm earnings in the Upper Subarea were much lower, at \$6,515, only about 50 percent of the national average as shown in Figure 3–8. These relatively low average earnings are probably a reflection of the large number of persons engaged only in part-time farming, either as proprietors or as employees, as well as the seasonal nature of much of the work.

In contrast, average manufacturing earnings in the study area were almost as high as the national average, at \$47,949, over 98 percent of the national average. Both the Upper and Illinois Subareas had average manufacturing earnings slightly above the national average. In the Lower subarea, the average was about the same as in the study area, about 98 percent of the national average. In contrast, the average in the Middle Subarea was lower, \$40,719, almost 84 percent of the national average.

Figure 3-4: Poverty Levels in the Study Area in 1999

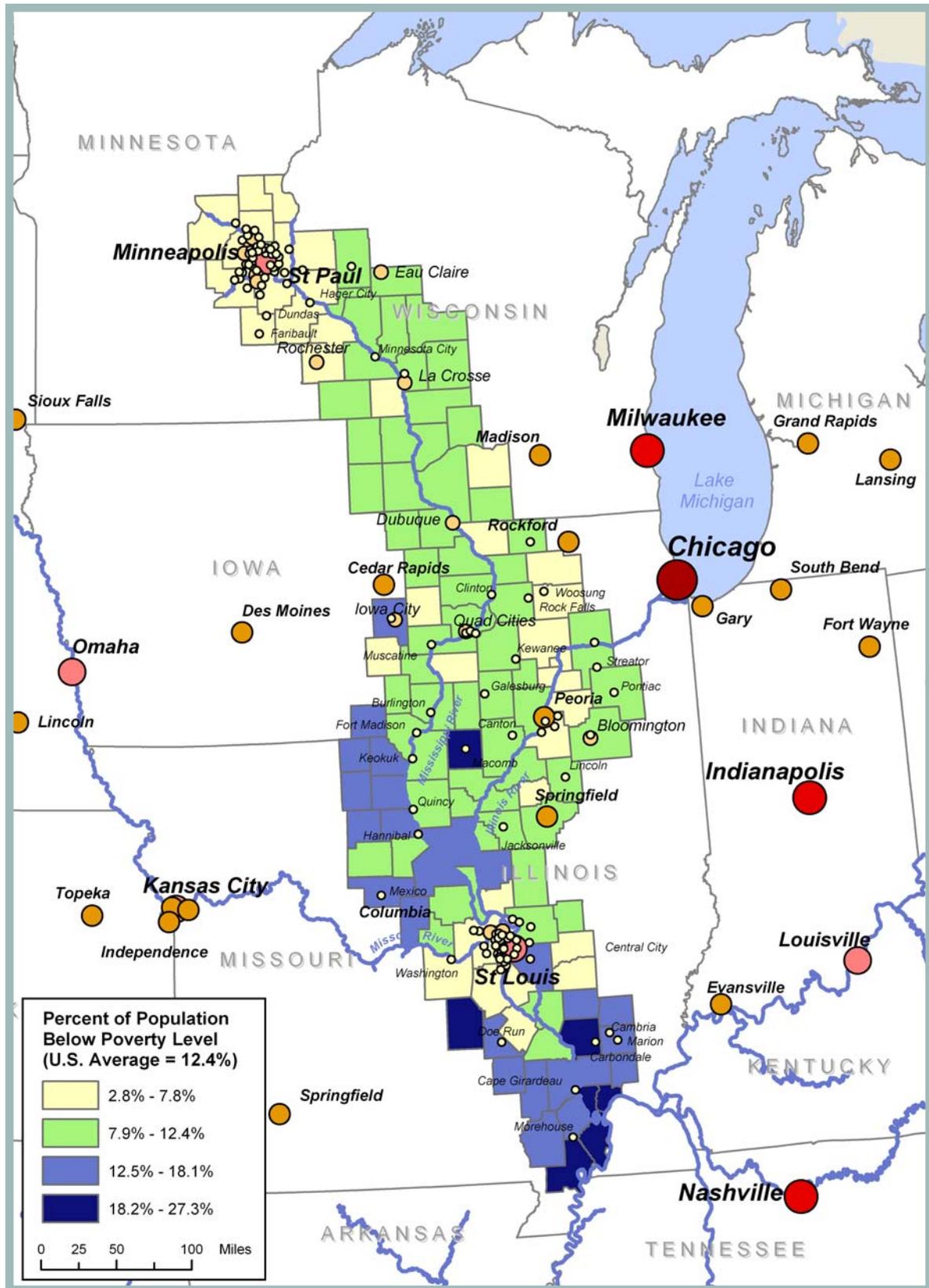


Figure 3–5: Unemployment Rate in 2002

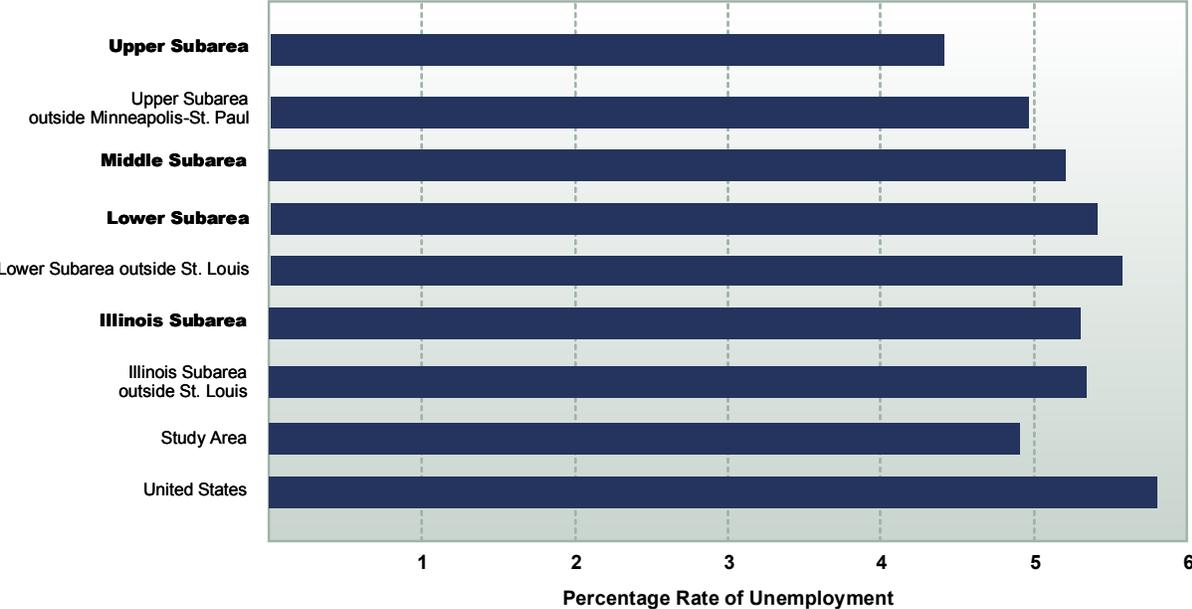


Figure 3–6: Farming and Manufacturing Employment in 2001

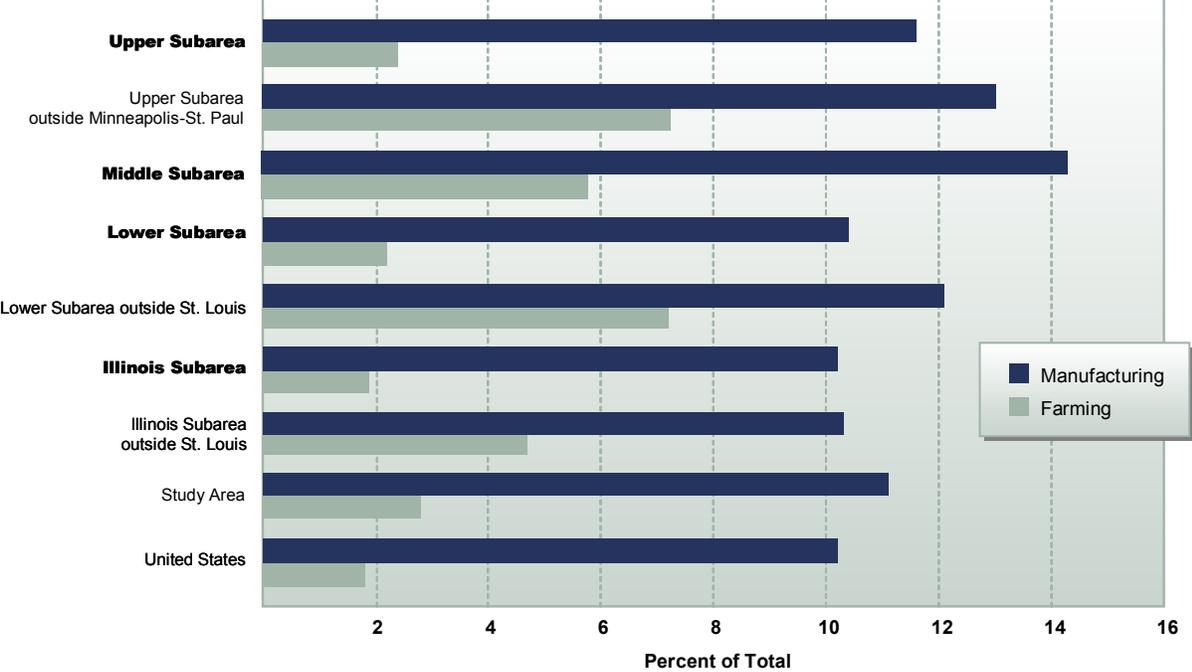


Figure 3-7: Percent of Work Force in Farming

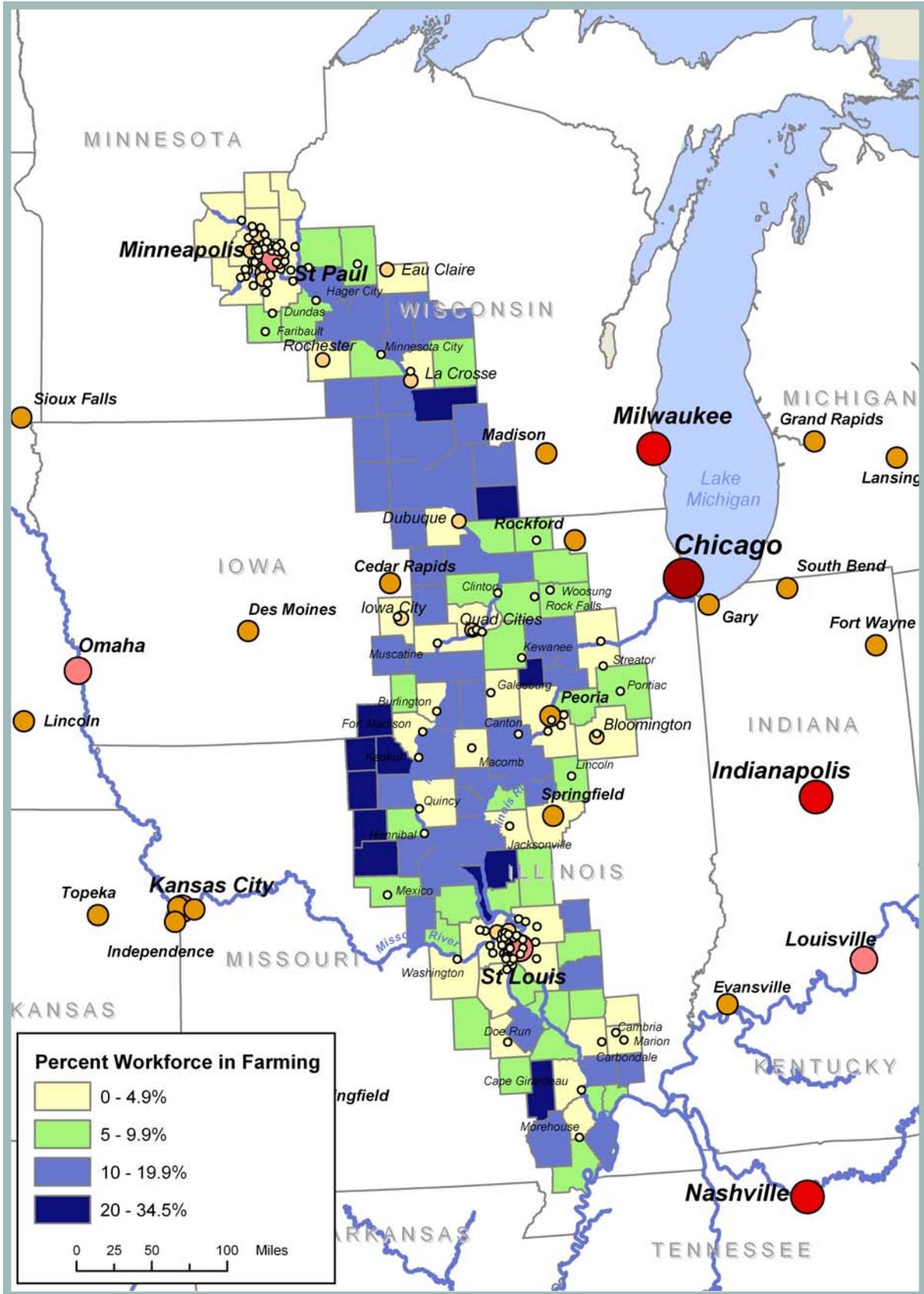
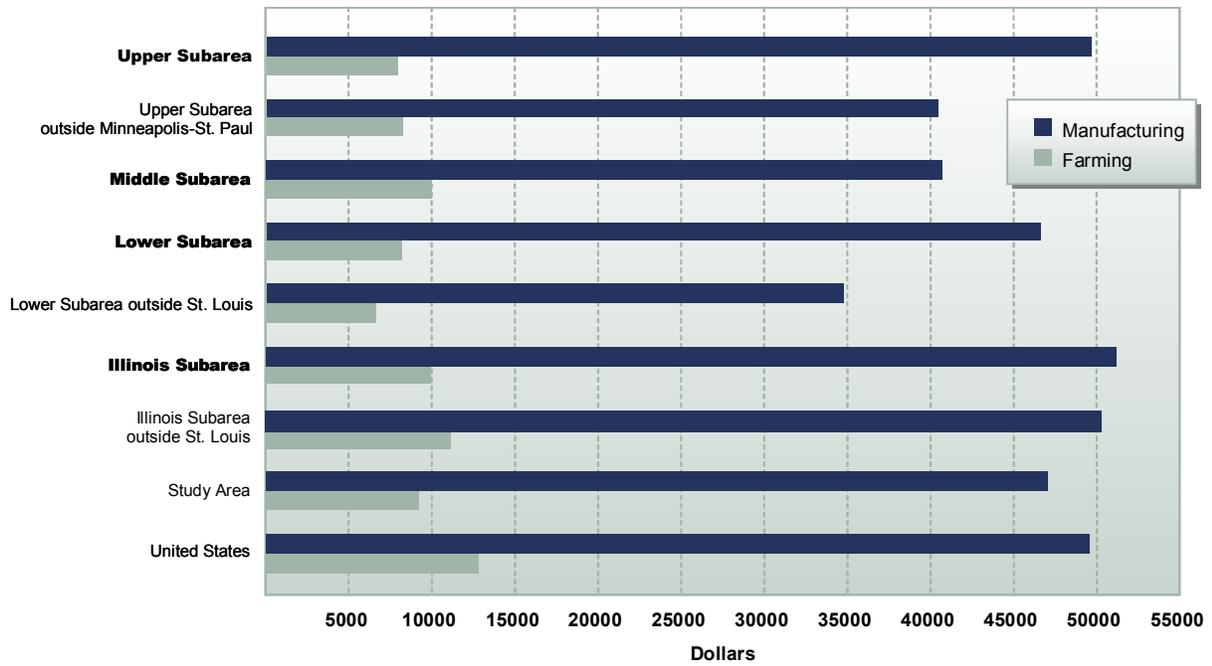
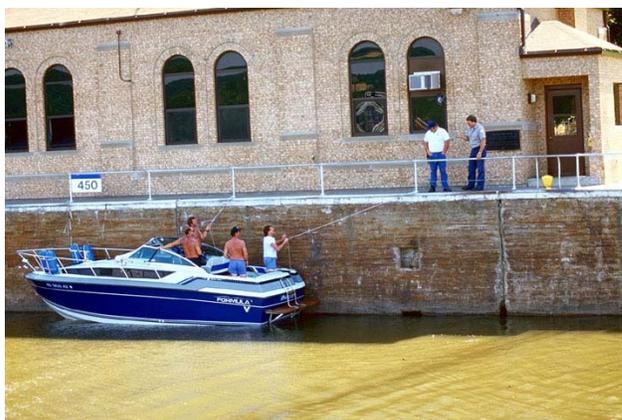


Figure 3–8: Average Farming and Manufacturing Earnings in 2001



The Mississippi River is one of the world's major river systems, not only in size, but in terms of other characteristics such as the diversity of its physical environment and its habitat. The pools created by the locks and dams on the Upper Mississippi River System provide many recreational opportunities such as fishing, swimming, boating, hunting, and sight-seeing. Boating is a popular activity on the pools above the various locks and dams, and is often associated with other recreational activities. Boat trips on the Upper Mississippi River-Illinois Waterway average about 5 hours per trip, but active time on the water averages about 3 hours (Carlson, Bartell, and Campbell, 2000). The U.S. Army Corps of Engineers operates and maintains recreational areas and provides basic stewardship of the natural resources on their project lands and waters. In addition, recreational facilities, services, and management of natural resources are provided by various federal and state government entities and by the private sector.

**Figure 4–1: Recreational Lockage at Lock and Dam 26**



At many locations along the Upper Mississippi River, fee-owned lands above locks and dams are subject to inundation by normal river overflows, providing habitat for aquatic life and wildlife and opportunities for recreational activities such as hunting, fishing, bird watching, hiking, and photography.

For example, facilities at Pool 26 (Melvin Price Locks and Dam at Alton, Illinois, and West Alton, Missouri) provide boating opportunities, including boat ramps, as well as bank fishing, bird watching, hiking, sight-seeing, picnicking,

and hunting. In 2001, 2,233 recreational vessels, such as in Figure 4–1, locked through this location. However, most recreational boats do not travel between pools. It is estimated that in 2000, over 150,000 recreational boat trips were taken on Pool 26 (Carlson, Bartell, and Campbell, 2000). Undoubtedly, many of these boaters enjoyed other recreational activities as well, such as picnicking or fishing. In addition to these recreational activities, an aquatic area provides educational and research opportunities for lake-habitat studies.

The Smith's Island Recreational Area, located near Lock and Dam 14, is a unique area providing many opportunities to visitors. Two picnic shelters with electrical outlets, water, and grills are available for public

**Figure 4–2: Fishing at Smith Island**



use. Fishing, bird watching, and just enjoying nature are all available at this site. A fishing pier near the parking lot makes fishing convenient. However, there are other spots around the shoreline of the channel and the LeClaire Canal that provide good fishing for various species, including Large Mouth Bass, Walleye, Bluegill, Crappie, Bullhead, and Channel Catfish. Heron, gulls, hawks, and other birds are common in the area. Boating is a popular activity too; 5,580 recreation vessels passed through Lock 14 in 2001. An estimated 75,000 recreational boat trips occurred during 2000 on this pool (Carlson, Bartell, and Campbell). The Smith's Island Nature Trail, just upstream

of the lock, provides opportunities to spot numerous species of wildlife and plants. The trail is over a mile long, hosting a mix of upland and river-bottom tree species, along with spring wildflowers and frequent sightings of turtles and ducks (and maybe a snake). Annual bald eagle watches attract thousands of visitors from across the Midwest. In addition to its scenic value, this trail draws school children for its historic resources and natural history.

Numerous recreational sites are located throughout the study area providing various combinations of opportunities for recreational activities. Together, they are an important resource to all the people of the area and to visitors from outside the area.

A 1995 study of recreational impacts on the Upper Mississippi River system (Carlson, et al) estimated that over 2.3 million recreational party trips were made to developed areas, sight-seeing/visitor areas, marinas, and permitted docks during the study period (around 1990). These group trips equate to over 12 million visitor days. Developed areas accounted for more than 60 percent of these visits. Boating, fishing, and sight-seeing were the most popular activities, with half of all visitors boating.

Nearby residents accounted for most of the visits, ranging generally from two-thirds to three-fourths of all visits, depending on the type of access. About three-fourths of all trips were single day trips, as opposed to trips involving overnight stays.

Total spending by visitors was estimated to be over \$190 million on items consumed on trips and an additional \$150 million for durable items. Most of the spending for items consumed on trips was for food, gas, lodging, and boating expenses. Durable goods purchased consisted largely for boating equipment, camping vehicles, and fishing gear. Average spending per visitor per day was \$15.84 for items consumed on trips and \$12.54 per visitor per day for durable goods. An estimated one-third of all this spending in the area was by nonresidents, about \$115 million.



# Transportation

## Role of Transportation in the Economy

The study area has access to and utilizes all modes of transportation—highway, rail, waterway, air, and pipeline. This section includes a discussion of each mode and the commodities moved by that mode (where available) for the study area and for each subarea. Because of the concentration of economic activity within the study area’s two largest urban areas, St. Louis and Minneapolis-St. Paul, additional information excluding the Metropolitan Statistical Area (MSA) of these cities are provided where appropriate. Please note that adding miles, tons, and number of facilities, etc, will not equal study-area totals because of subarea overlaps (see Figure 1–2).

A brief discussion of the transportation related trends in the region and a summary of findings conclude this section.

## Road Transportation

### Highway Systems

According to the Bureau of Transportation Statistics (BTS) National Transportation Atlas Database (NTAD), the study area is currently accessible by over 20,000 miles of federal, state, and local highways, over 2,500 miles of which are part of the National Interstate Highway System (NTAD, 2003).

There are roughly similar numbers of overall highway miles among the four subareas, but there is considerable difference in interstate accessibility as shown in Table 5–1. For example, while the Middle Subarea is transected

**Table 5–1: Study Area Highway Miles**

	Entire Study Area		Excluding Major MSAs	
	Interstate	All Highways*	Interstate	All Highways*
Upper Subarea	592	7300	265	4655
Middle Subarea	395	5238	395	5238
Lower Subarea	807	5657	411	3560
Illinois Subarea	1047	6407	674	4427

\*Includes interstate, federal, state, and county highways.  
Source: BTS NTAD, 2003.

by 395 interstate miles, the Illinois Subarea contains over 1,000 interstate miles. The Upper and Lower Subareas contain 592 and 807 interstate miles, respectively. If one excludes the Minneapolis-St. Paul and St. Louis MSAs, interstate miles are about half of the total for the Upper, Lower, and Illinois Subareas.

Clearly, being inclusive of or proximate to a major population center influences the number of highway miles within a subarea since this is typically where interstate highways intersect as shown in Figure 5–1. The Upper Subarea, anchored at the northern end by the “twin cities” of Minneapolis, and St. Paul, Minnesota, includes the intersection of Interstate 35 which runs north-south from Duluth, Minnesota to Laredo, Texas, and Interstate 94, which runs east-west from Port Huron, Michigan, to Billings, Montana. This subarea is flanked much of its length by these two interstates. The only other interstate highway that traverses this subarea is Interstate 90, a major east-west corridor that diverges from Interstate 94 just east of La Cross, Wisconsin, and exits the subarea southwest of Rochester, Minnesota. Interstate 80, another major east-west route, lies just to the south of the Upper Subarea as shown in Figure 5–2.

The Middle Subarea does not contain a single major population center—Quad Cities area (Davenport and Bettendorf, Iowa, and Moline and Rock Island, Illinois) serves that function and is the location of the intersection of Interstate 80 connecting New York City with San Francisco, and Interstate 74 connecting Peoria, Illinois, with Interstate 80, and Interstate 88 connecting the Quad Cities to Chicago is shown as Figure 5–3. Interstate 72 links Quincy, Illinois, with the state capital Springfield and Interstate 55 at the southern end of the Middle Subarea.

The Lower Subarea is dominated by Interstate 55 running north-south and Interstate 70 running east-west. These two highways intersect at St. Louis, the subarea’s geographic center as shown in Figure 5–4. Interstate 64 enters the subarea from the east, and Interstate 44 enters from the southwest; both terminate at St. Louis. Interstate 57 skirts the region along its southeastern edge. Quincy enjoys access to the interstate system in the northern portion of the subarea via Interstate 172 to Interstate 72 and east to Springfield.

The Illinois Subarea has arguably the best road access of the four subareas, contains one major population center to the south (St. Louis, Missouri), and is quite close to another (Chicago, Illinois) at its northern end as shown in Figure 5–5. Interstate 55 is a heavily trafficked north-south transportation corridor which connects Chicago with St. Louis and south to Memphis, Tennessee, and New Orleans, Louisiana. Interstate 55 marks the eastern edge of the subarea. Interstate 80 and Interstate 70, two heavily traveled east-west routes, cut through the northern and southern portions of the subarea, respectively. Additionally, Interstate 44 heads off to the southwest from St. Louis; Interstate 74 cuts across the northern half of the subarea from Champaign, Illinois, through Peoria, and then north to Davenport; Interstate 39 flows north from Bloomington, Illinois, to Wausau, Wisconsin; and Interstate 72 connects Champaign, just outside the subarea to the east, to Springfield, and west to Quincy. Interstate 64 enters St. Louis from the east.

## Truck Movements

The U.S. Department of Transportation’s (USDOT) Federal Highway Administration (FHWA) traffic count data, the Highway Performance Monitoring System (HPMS), allows for estimations to be made of daily and annual truck counts for the study area. The data supply traffic counts per highway segment and the percentage of

Figure 5-1: Study Area Highway Network





Figure 5-3: Middle Subarea Highway Network

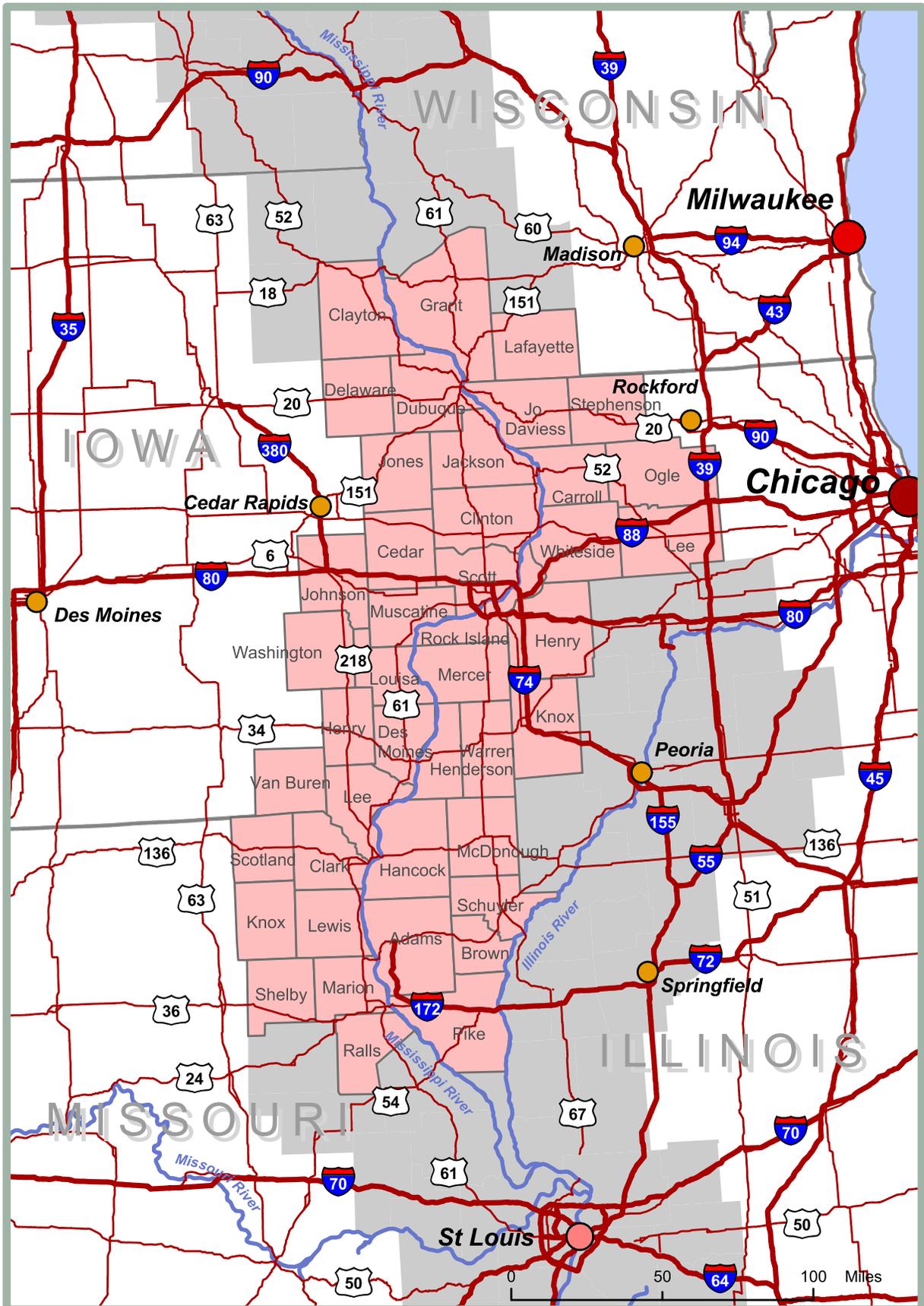
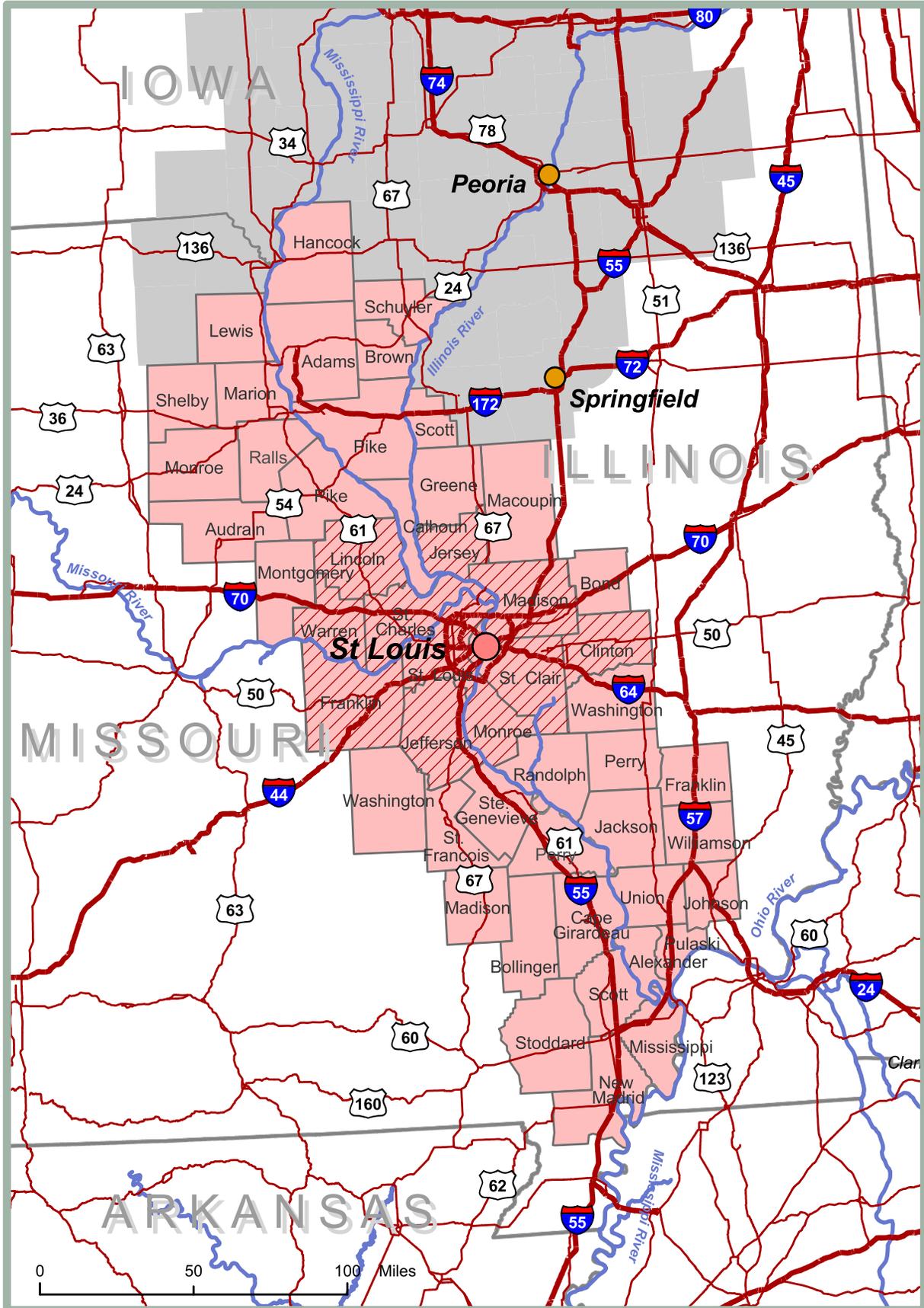


Figure 5-4: Lower Subarea Highway Network





truck traffic on a sample basis. To avoid double counting, the average count per county was used. Information about commodities moving by truck is not available at the county level.

In 2001, daily truck traffic for the entire study area was, on average, 4.6 million single- and multi-axle trucks per day. Figure 5–6 shows how the multi-axle truck traffic was distributed across the region. The heaviest concentration of total truck traffic occurred in the St. Louis metropolitan area, with St. Louis County, at an estimated 644,000 trucks per day. The second largest multi-county concentration was in the Minneapolis-St. Paul metropolitan area. Here, Hennepin County averaged 318,000 trucks per day in 2001.

Johnson County, south of Cedar Rapids, Iowa, appears to have truck traffic comparable to Hennepin County. While Interstates 80 and 380 intersect in this county, and truck traffic is expected to be higher in a county with interstates, there are an inordinately high number of Interstate 80 highway segments in the sample for this county. Thus, high truck-traffic counts in Johnson County, as reported in the 2001 HPMS, seem to be a function of misrepresentative sampling rather than actual traffic volume, producing multiple counts of the same trucks. Discussions with Iowa’s

Department of Transportation personnel confirm that the average annual traffic counts for Johnson County are unreasonably high in the 2001 HPMS data. (Bunting, personal communication, 2003)

Table 5–2 shows truck traffic counts by subarea. The truck counts rank in the same order as the total highway miles per subarea shown previously in Table 5–1. Notable is the Middle Subarea, with the lowest average daily truck count and the fewest total highway miles.

**Table 5–2: Average Annual Daily Truck Traffic**

	<b>Average Annual Daily Truck Traffic</b>	<b>Average Annual Daily Truck Traffic Excluding Major MSAs</b>
Upper Subarea	1,371,289	680,895
Middle Subarea	937,549	937,549
Lower Subarea	1,061,565	266,276
Illinois Subarea	1,275,059	516,100

Source: FHA, HPMS, 2003.

## Rail Transportation

### Major Rail Systems

The study area as a whole contains slightly over 9000 miles of active rail network as shown in Figure 5–7. The Federal Railway Administration (FRA) identifies 41 different railroads (ownership) in the region, with 5 of the 11 Class I railroads represented. Four Class I rail companies dominate the rail industry in the region in terms of miles of track. The Burlington Northern Santa Fe Railway (BSNF) is the largest railroad in the region with some 2500 miles of active track. The Union Pacific (UP) owns 2000 miles of track and is the second biggest operator in the area. The Norfolk Southern (NS) owns 760 miles of track in the region, and the Canadian National Railway Company (CN) Railroad rounds out the top four with 650 miles of track. A regional line, the Iowa, Chicago & Eastern, known as I C & E (formerly the I & M Rail Link, or IMRL), is the fifth largest rail company in the study area with about 500 miles of track. These companies may have trackage-use agreements with other Class I, regional, or shortline rail carriers in the area. In other words, track ownership does not necessarily mean exclusive use. Miles of track and predominant carriers in the four subareas are identified in Table 5–3.

Figure 5-6: Average Annual Daily Multi-Axle Truck Traffic in the Study Area

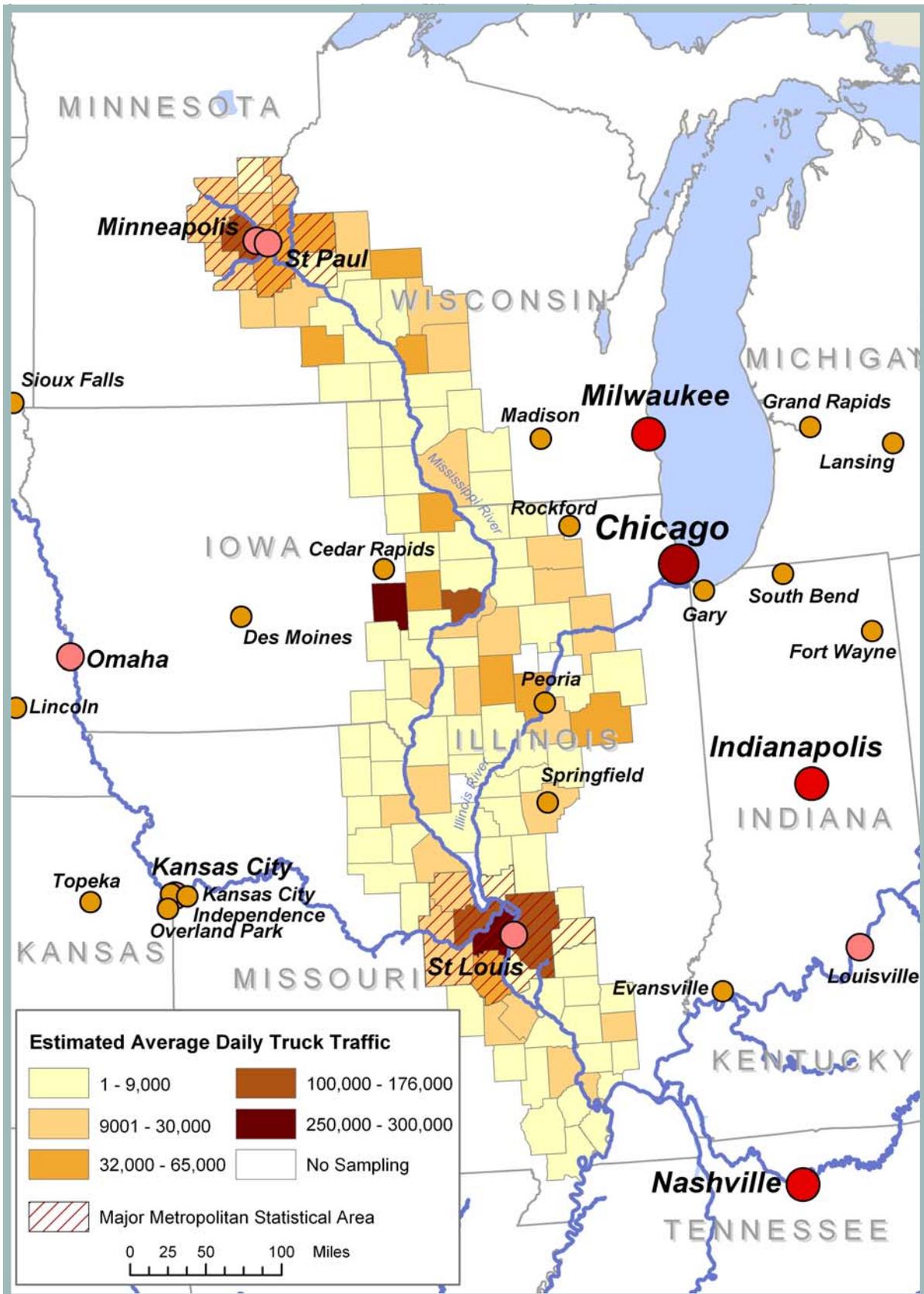
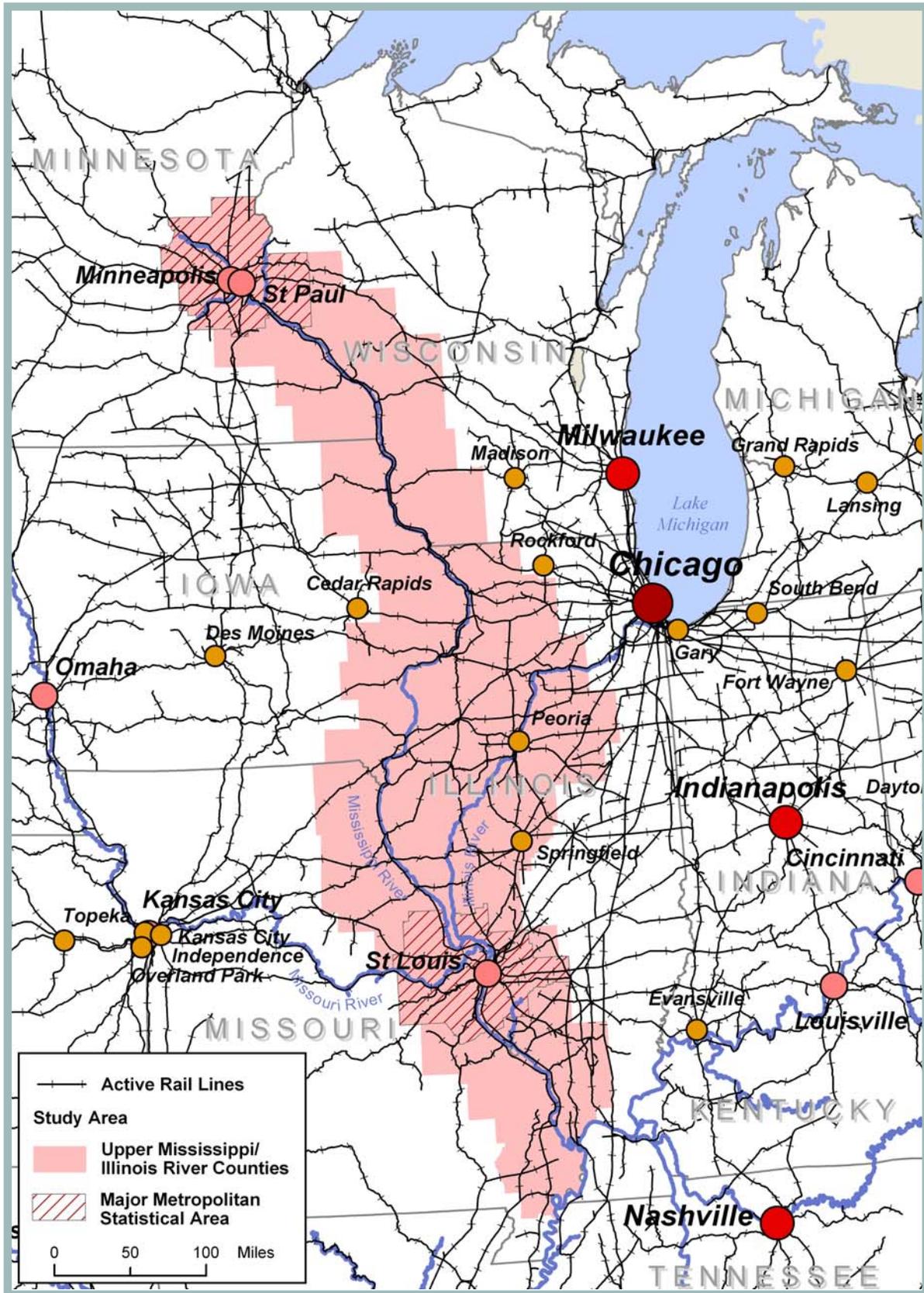


Figure 5-7: Study Area Rail Network



**Table 5-3: Rail Statistics by Subarea**

	Miles of Track in Study Area	Miles of Track Excluding MSAs	Carrier
Upper Subarea	2561	1395	BNSF (630 miles)
Middle Subarea	2394	2494	BNSF (1100 miles)
Lower Subarea	3385	1983	UP (980 miles)
Illinois Subarea	3840	2432	BNSF (1150 miles)

Source: NTAD, 2003.

## Commodity Movements by Rail

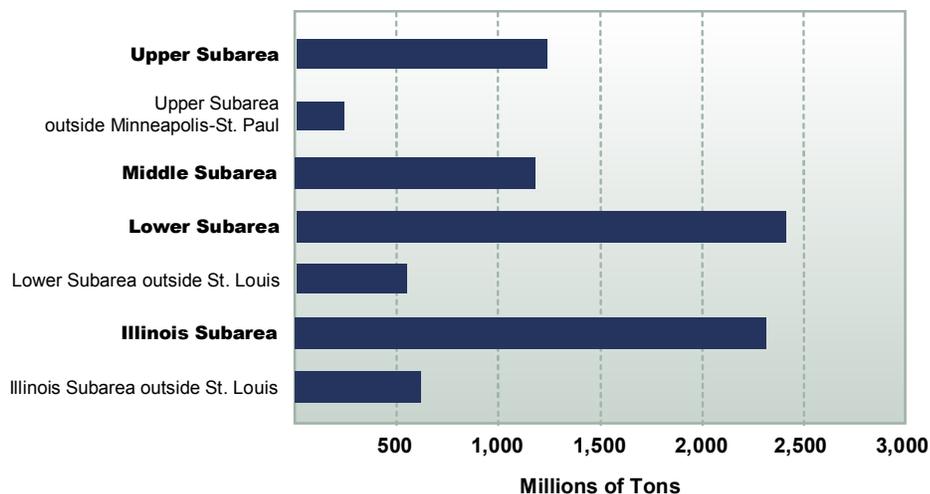
The Surface Transportation Board's (STB) Carload Waybill Sample (CWS) identifies rail traffic originating or terminating by county. For this study, this information has been aggregated to the subarea level. In 2001, 4.2 billion tons of commodities either originated or terminated by rail in the study area. About 8 percent of that traffic, or 363 million tons, was intraregional. Coal was the dominant intraregional commodity with almost 240 million tons,

two-thirds of the intraregional movements by rail. Other large intraregional rail movements included farm products (21 million tons), food products (20 million tons), and 20 million tons of chemicals.

Rail traffic with origins or destinations outside of the study area totaled 3.8 billion tons in 2001. Again, coal was the predominant commodity (1.97 billion tons) accounting for 51 percent of all movements. Other commodities moved into or out of the study area by rail included 344 million tons of food products, 328 million tons of farm products, 292 million tons of chemicals, 154 million tons of transportation equipment, and 129 million tons of primary metals.

Subarea rail traffic is identified in Figure 5-8. The Upper Subarea had 1.2 billion tons of inbound and outbound rail traffic, but only 172 million of that occurred outside of the counties in the Minneapolis-St. Paul metropolitan area. Middle Subarea traffic totaled 1.2 billion tons in 2001. The Lower Subarea was the origin or destination for 2.4 billion tons of rail traffic, 544 million tons of which occurred outside the St. Louis metropolitan area. The Illinois Subarea had 2.3 billion tons of rail traffic in 2001, some 625 million tons of which took place outside of the St. Louis metropolitan area.

**Figure 5-8: Study Area Rail Tonnage in 2001**



Coal was the number one commodity in all subareas for both originating and terminating rail traffic. Farm products, chemicals, and food products are other important commodities in all subareas. The top ten commodities for each subarea by direction (originating and terminating) are detailed in Table A–7 through A–10 in Appendix A. (Ten commodities captures 94.6 percent to 98.7 percent of all traffic depending on the subarea and direction of traffic.)

The study area is one of the most heavily rail-trafficked areas in the country. Traffic is particularly dense in the southernmost two-thirds of the study area as shown in Figure 5–9, much of which is through traffic.

## River Transportation

### Description of the System

The study area is bisected by the Mississippi River, the main artery in the national Inland Waterway System. The Mississippi River flows about 2000 miles from its source in Minnesota to its mouth south of New Orleans. The Illinois River transits the eastern portion of the study area and is a tributary of the Mississippi River, flowing southwest from Chicago to the Mississippi just north of St. Louis. The Sanitary and Ship Canal in Chicago connects the Illinois River with Lake Michigan, other Great Lakes, and the Atlantic Ocean via St. Lawrence Seaway.

The study area has 1420 miles of navigable waterway on the Mississippi, Illinois, Missouri, Kaskaskia, Minnesota, and St. Croix Rivers with 35 main locks and 7 auxiliary locks. Four of these locks are on the Illinois River, and one on the Kaskaskia River. There are 29 navigation locks on the Mississippi River between Minneapolis-St. Paul and St. Louis as shown in Figures 5–11 through 5–14.

**Table 5–4: Inland Waterway Statistics by Subarea**

	Miles of Navigable Waterway	All Terminals	Barge Terminals
Upper Subarea	397	148	48
Middle Subarea	431	137	80
Lower Subarea	704	252	149
Illinois Subarea	627	298	184

Source: U.S. Army Corps of Engineers, Waterway Data CD, 2003.

According to USACE’s Waterway Data, there are almost 600 waterway facilities in the study area. These include ferry landings, U.S. Coast Guard and USACE docks, fleeting areas, dry docks, and other noncargo related moorings and docks. Of the 600 terminals, almost half are terminals where commodities are loaded and unloaded. Information regarding the waterway and terminals located in each subarea are shown in Table 5–4, waterway density and commodities are shown in Figures 5–15 through 5–23, and waterborne freight is shown in Tables A–11 through A–14.

### Major Shipments

The Mississippi and Illinois Rivers are major arterials in the National Inland Waterway System. The USACE Waterborne Commerce Statistics Center (WCSC) data provided information about all commerce on the inland waterways, including terminal of origin and destination, commodity, tonnage, and route. Total tons moved by study area waterways in 2001 are shown in Figure 5–10.

Figure 5-9: Study Area Rail Freight Density in 2001

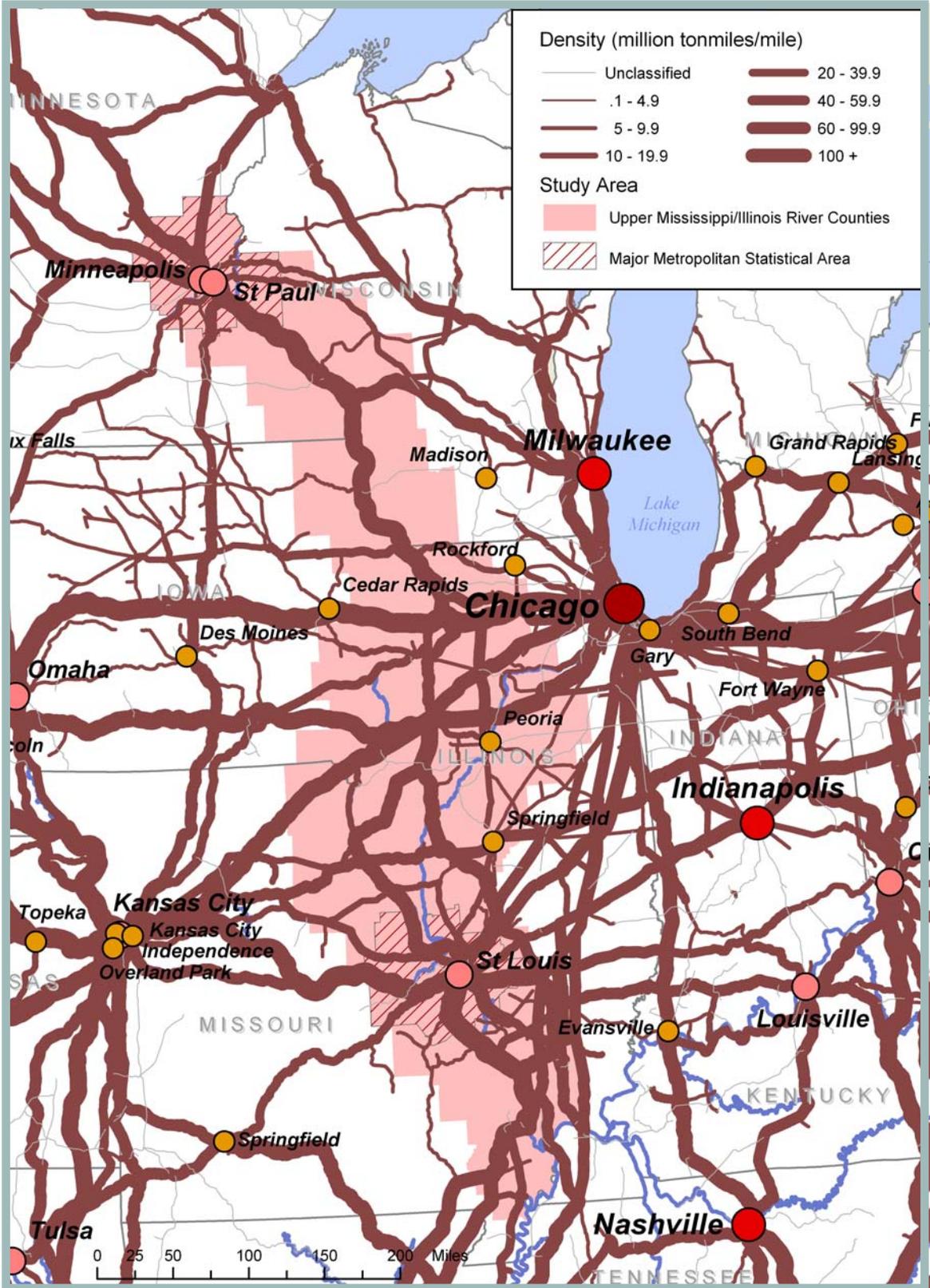
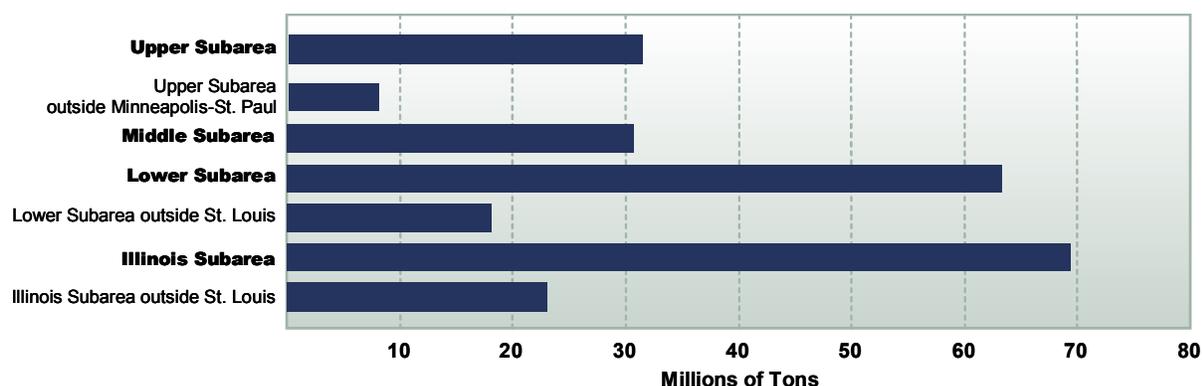


Figure 5–10: Waterway Tons in 2001



In 2001, WCSC data indicate that 114 million tons either originated or terminated on the waterways in the study area. Figures 5–16 through 5–23 show the distribution of originating and terminating tons in the study area by waterway link or reach. Waterway traffic is much more dense on the links downstream of St. Louis.

The commodities moved into and out of the study area in 2001 include (by USACE commodity groupings) 47 million tons of grain; 24 million tons of coal; 16 million tons of aggregates; 13 million tons of “all other” (a miscellaneous category that includes such cargoes as wood and wood products, cement, asphalt, newsprint, and machinery); 6 million tons of chemicals; 3 million tons of petroleum fuels, 3 million tons of iron and steel, and 2.7 million tons of ores and minerals. Again, grain traffic predominates in this mode of transport, representing 41 percent of all waterway freight. Coal was 21 percent of total traffic in 2001.

Waterborne commerce by commodity for each subarea for 2001 are shown in Tables A–11 through A–14. Terminals in the Illinois Subarea handled a total of 69.4 million tons of commodities. The Lower Subarea had 63.3 million tons of barge freight commerce in the Upper Subarea totalling 31.4 million tons, and the Middle Subarea terminals moved 30.6 million tons in 2001. Figures 5–16 through 5–23 show where the barge traffic originates and terminates within each subarea by commodity mix and volume.

## Air Transportation

### Major Airports

The study area has 18 airports that offer commercial (passenger or cargo) service. The largest of these, by number of scheduled operations, is the Minneapolis-St. Paul International Airport, followed by the St. Louis International Airport, with 430,000 and 376,000 scheduled flights annually respectively (inbound plus outbound), according to the BTS NTAD 2003.

The next largest airports have considerably less service available. These airports are the Quad Cities International Airport in Rock Island, Illinois, with 12,600 commercial flights; the Southeast Iowa Regional Airport in Burlington, Iowa, with 12,300 commercial flights; and the Capital Airport at Springfield, Illinois, with 11,700 flights annually. The 13 remaining airports in the region all handle less than 10,000 commercial

**Table 5–5: Airports with Commercial Service Within the Study Area**

	Airports	Annual Flights	Largest Airport	Excluding Major MSAs	
				Airports	Annual Flights
Upper Subarea	5	454,000	Minneapolis-St. Paul International	3	17,000
Middle Subarea	4	35,105	Quad Cities International	4	35,105
Lower Subarea	8	383,000	St. Louis International	4	6,545
Illinois Subarea	8	402,000	St. Louis International	4	26,000

Source: BTS NTAD 2003.

flights per year. Table 5–5 indicates the number of commercial airports per subarea and the largest airport in each subarea. Figures 5–24 through 5–28 show the locations of airports within the study area and each subarea. Note that the Chicago area airports, including Chicago-O’Hare with almost 700,000 commercial flights annually, lie just outside the eastern edge of the study area and are convenient to the Middle and Illinois Subareas.

### Destinations Served

As one would expect, both the Minneapolis-St. Paul and the St. Louis International airports provide service to just about anywhere nationally and abroad. According to the BTS Office of Airline Information, the Quad Cities International Airport also offers service to most major destinations nationally.

## Pipeline Transportation

Pipeline transportation is commodity specific. Three major pipeline networks provide service in and near the study area for crude oil, petroleum products, and anhydrous ammonia. The crude and petroleum pipeline networks are fairly extensive throughout the study area as shown in Figure 5–29, with Minneapolis-St. Paul and St. Louis as major hubs in the study area and Chicago just to the east of the study area. The pipelines cross the study area typically in a southwest to northeast direction. The area that is poorly covered by these pipelines is on the Mississippi River between Dubuque, Iowa, and Minneapolis-St. Paul in the upper part of the Middle Subarea.

The anhydrous ammonia pipeline has a less extensive network, but is of great importance to agriculture in the region. The pipeline that bisects the study area from the Missouri boot heel to Ft. Madison, Iowa, with offshoots to the east and west at St. Louis, originates in Louisiana. Anhydrous ammonia, or NH<sub>3</sub>, is an 80 percent nitrogen compound derived from natural gas. It is primarily used as an injected fertilizer or may be further processed into urea and other nitrogen based fertilizers.

Anhydrous ammonia is trucked from pipeline terminals to the farm up to about 200 miles. It may also be moved by barge or rail from either a pipeline terminal or the production source and then trucked to individual farms.

Figure 5–11: Upper Subarea Barge Terminals



Figure 5-12: Middle Subarea Barge Terminals

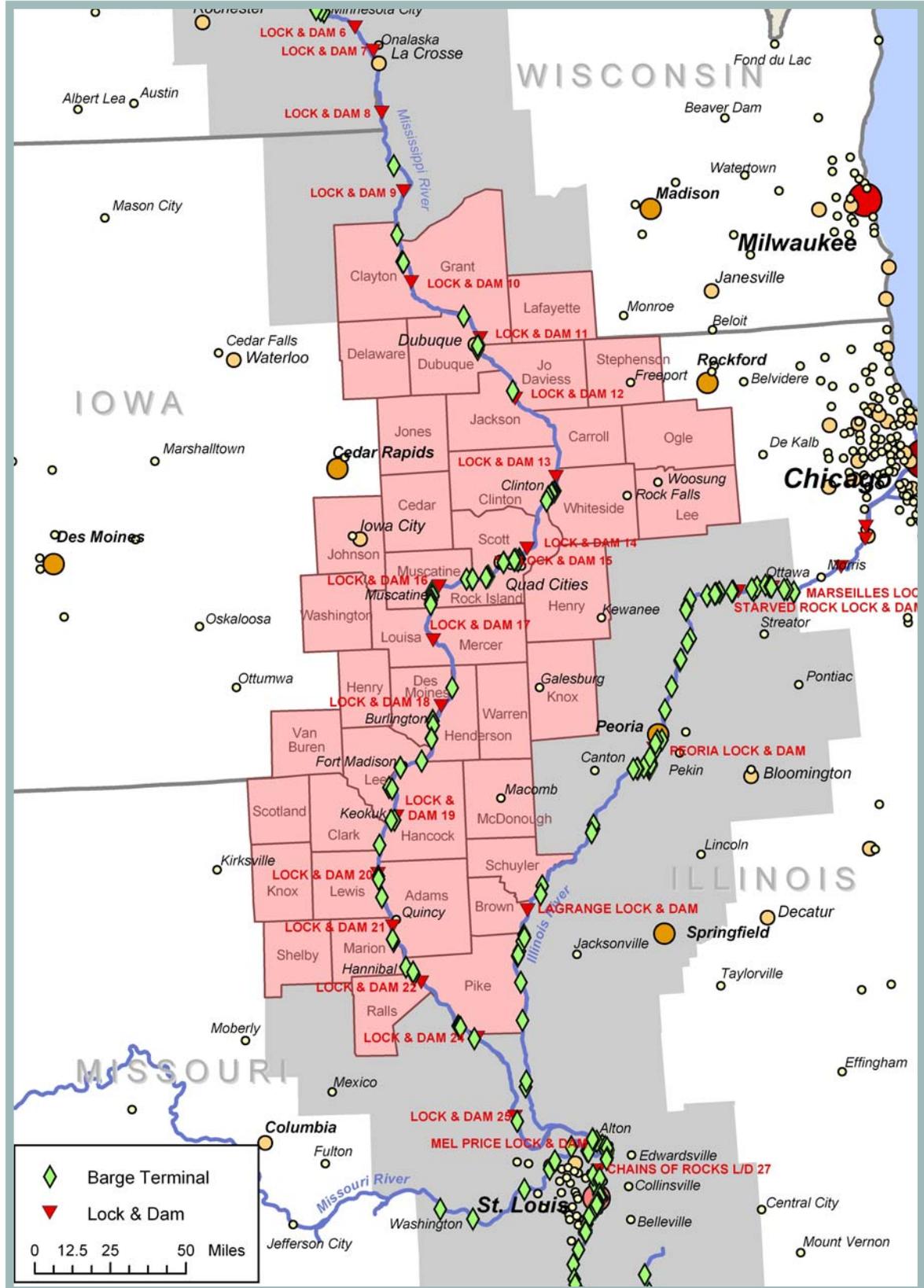




Figure 5-14: Illinois Subarea Barge Terminals

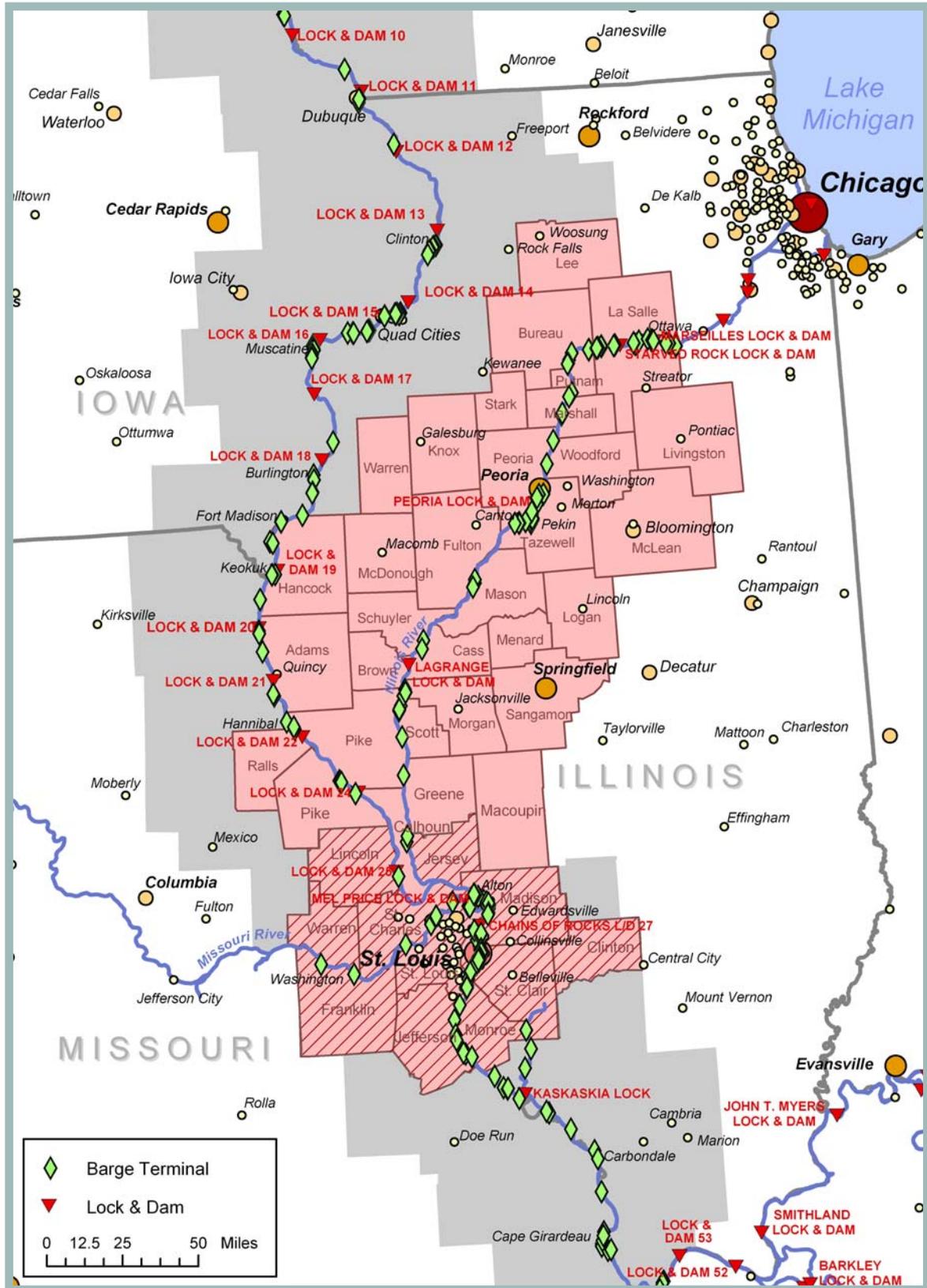


Figure 5-15: Waterway Freight Density in 2001



Figure 5-16: Waterborne Commerce Originating in the Upper Subarea in 2001

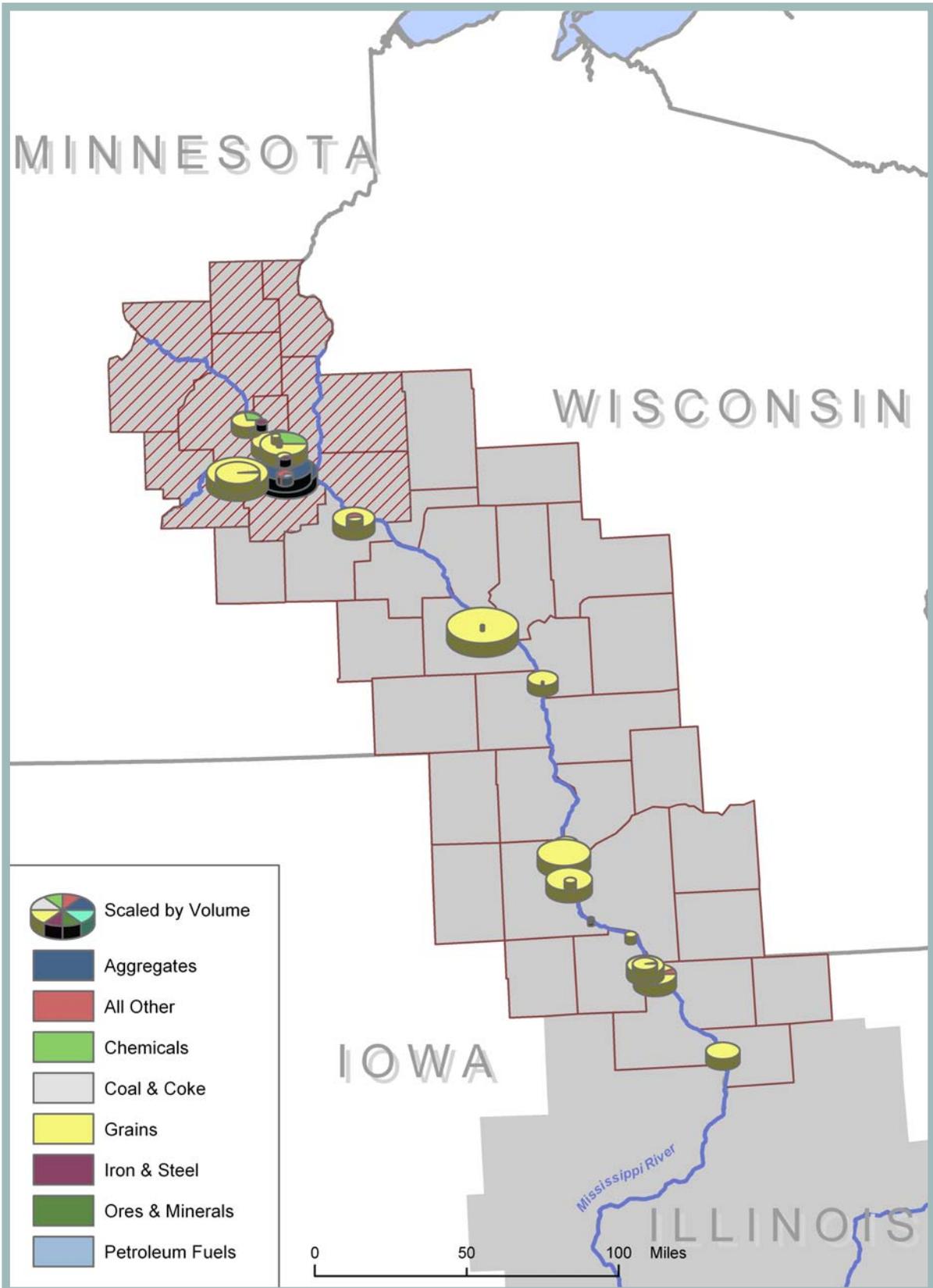


Figure 5-17: Waterborne Commerce Terminating in the Upper Subarea in 2001

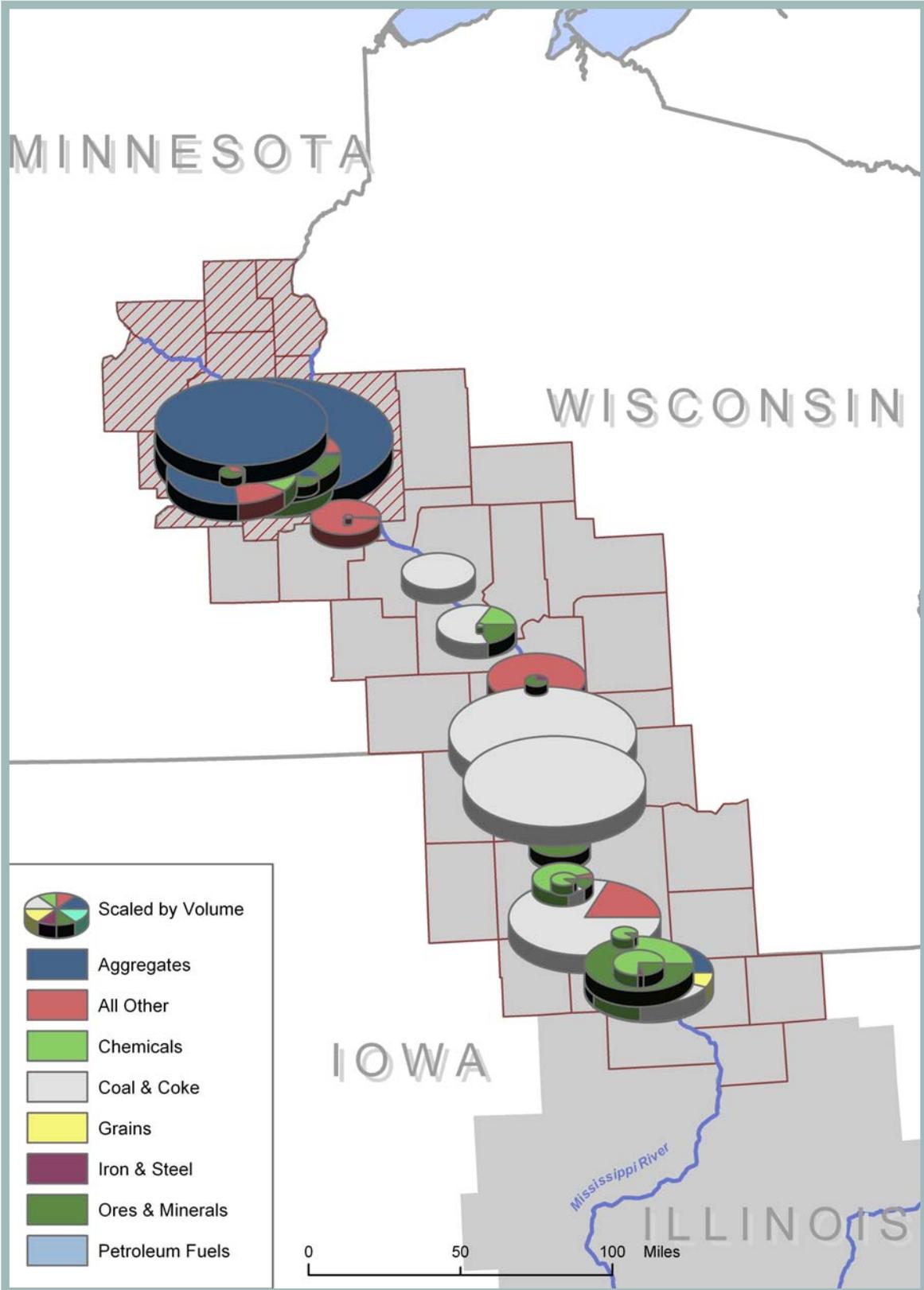


Figure 5-18: Waterborne Commerce Originating in the Middle Subarea in 2001

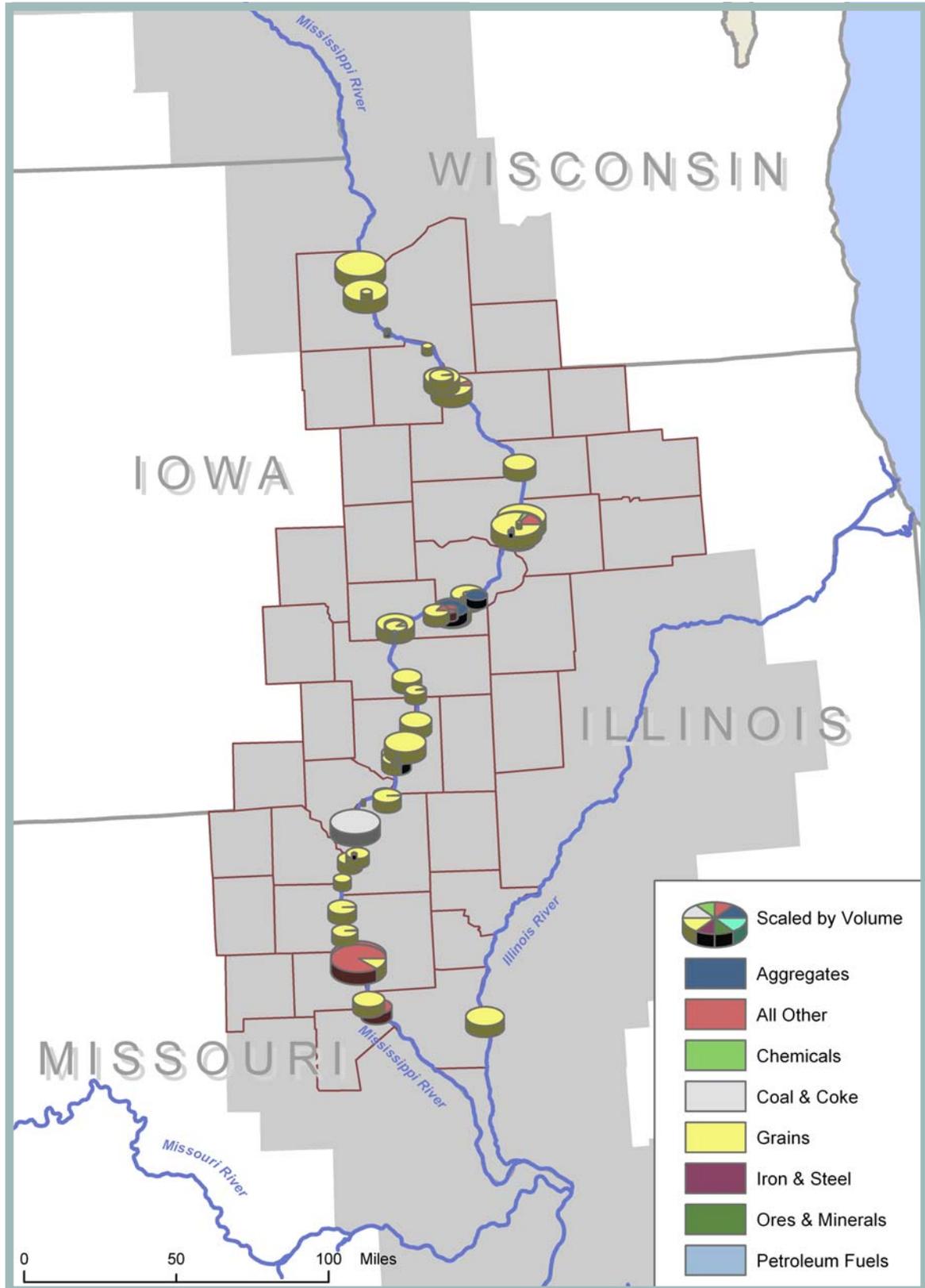


Figure 5-19: Waterborne Commerce Terminating in the Middle Subarea in 2001

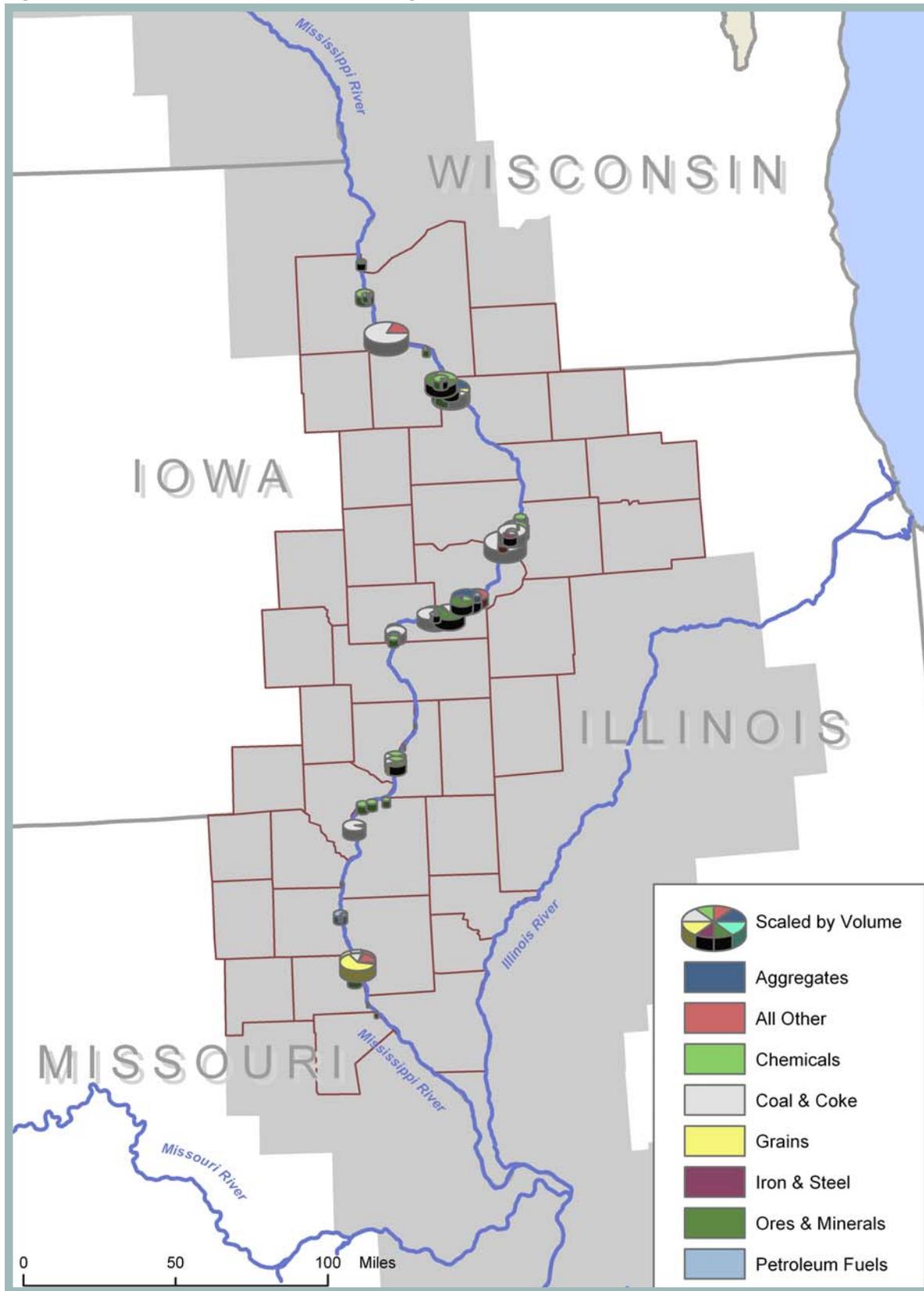


Figure 5-20: Waterborne Commerce Originating the the Lower Subarea in 2001

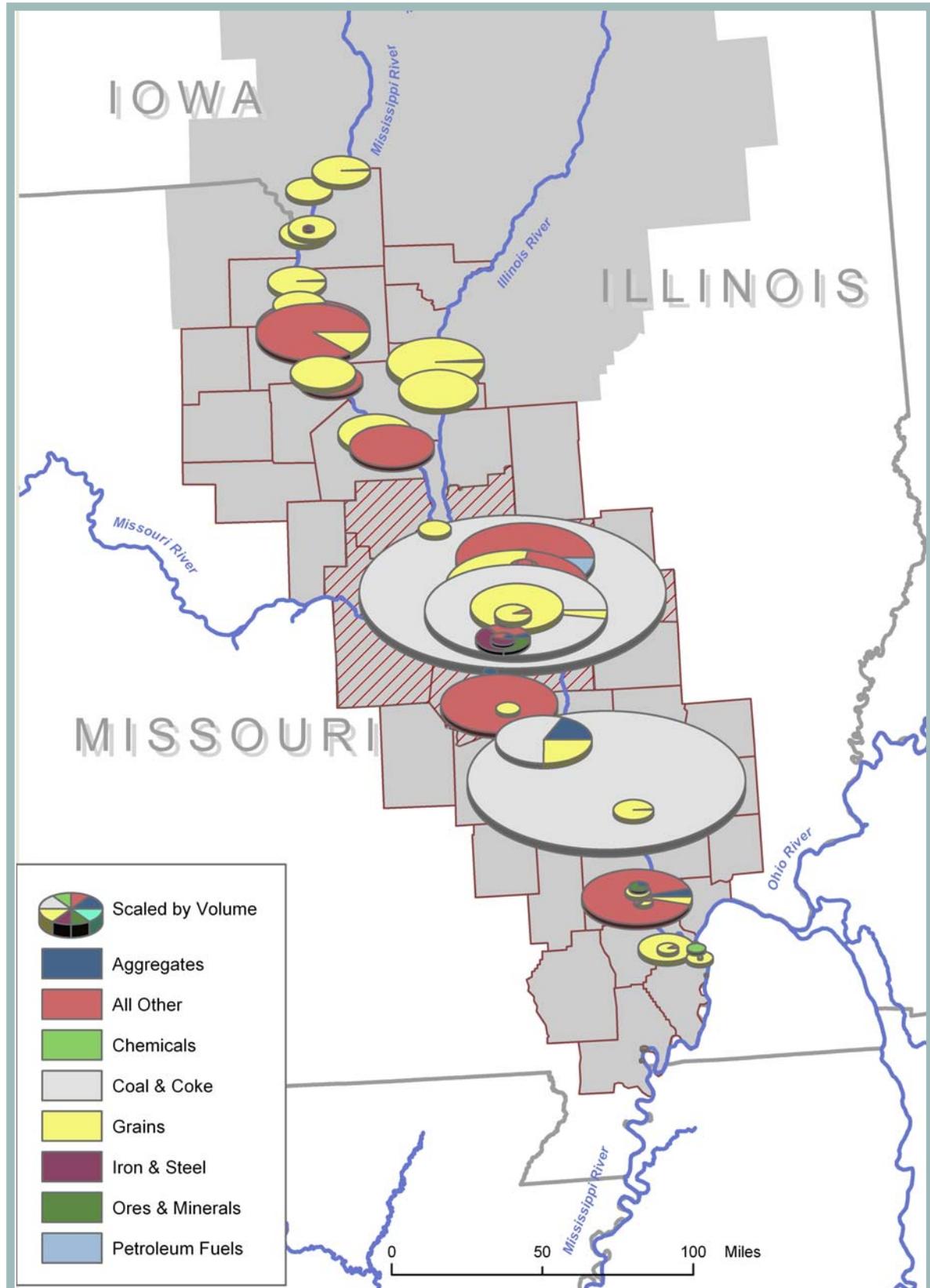


Figure 5-21: Waterborne Commerce Terminating in the Lower Subarea in 2001

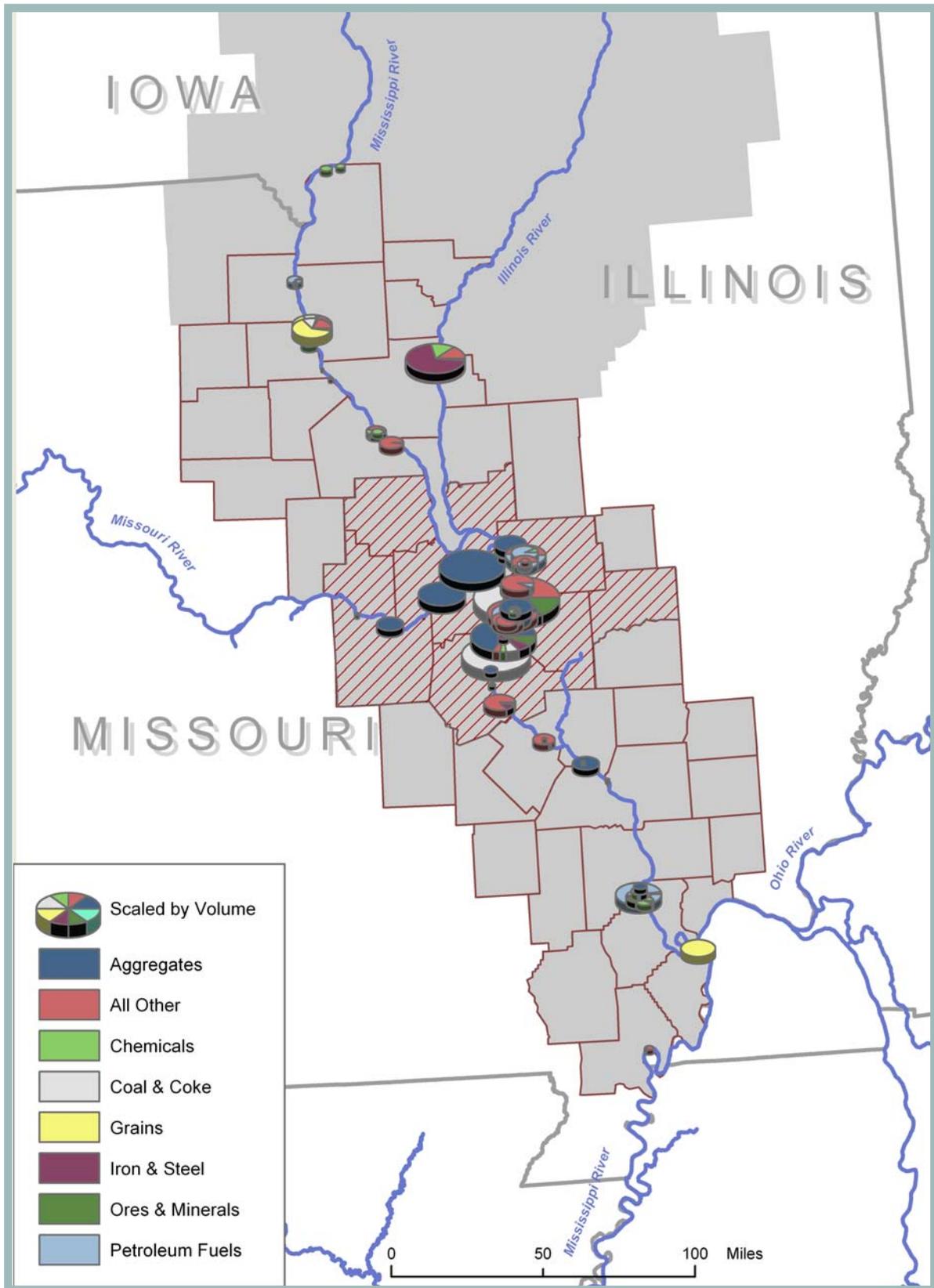


Figure 5-22: Waterborne Commerce Originating in the Illinois Subarea in 2001

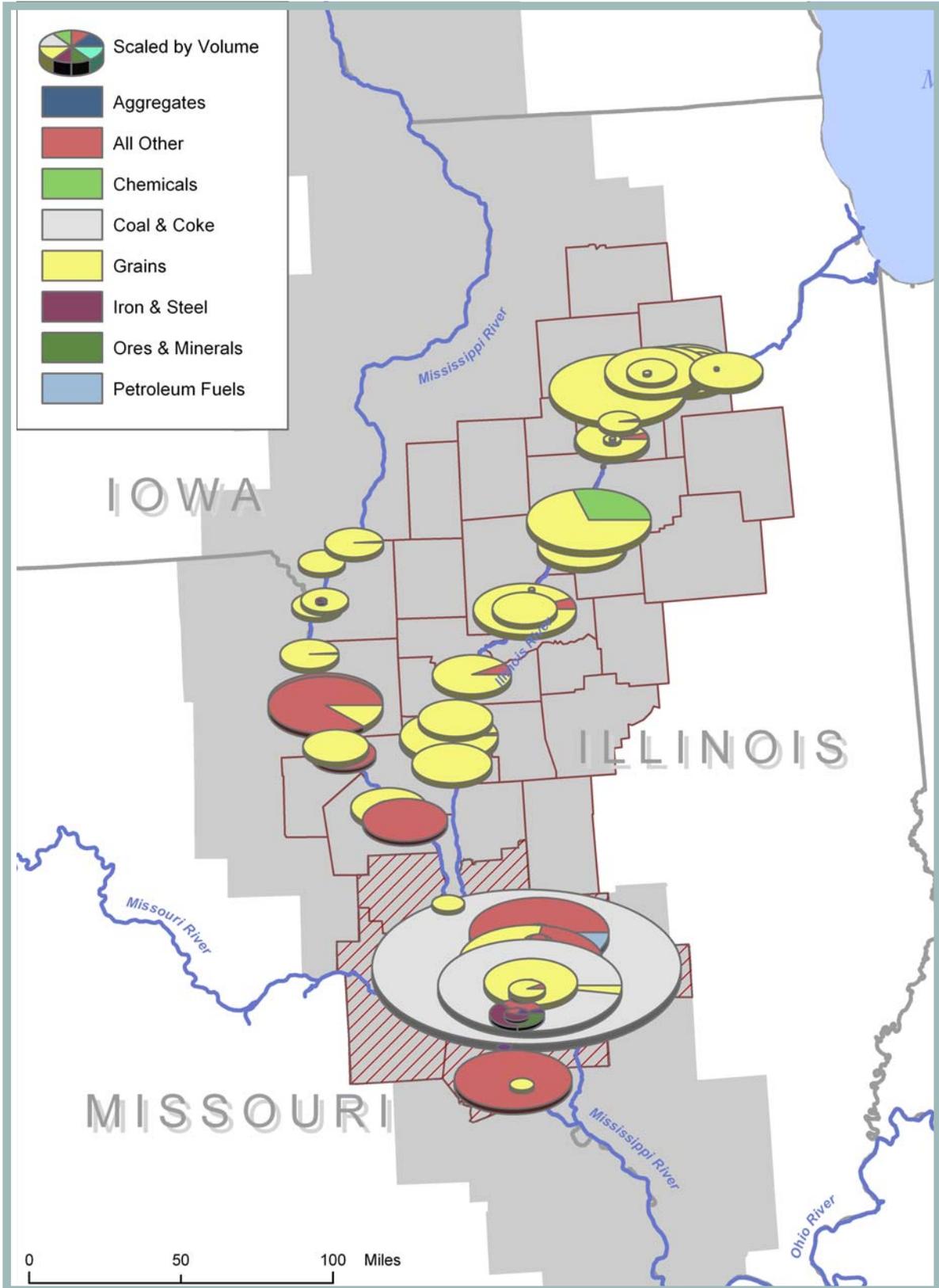


Figure 5-23: Waterborne Commerce Terminating in the Illinois Subarea in 2001

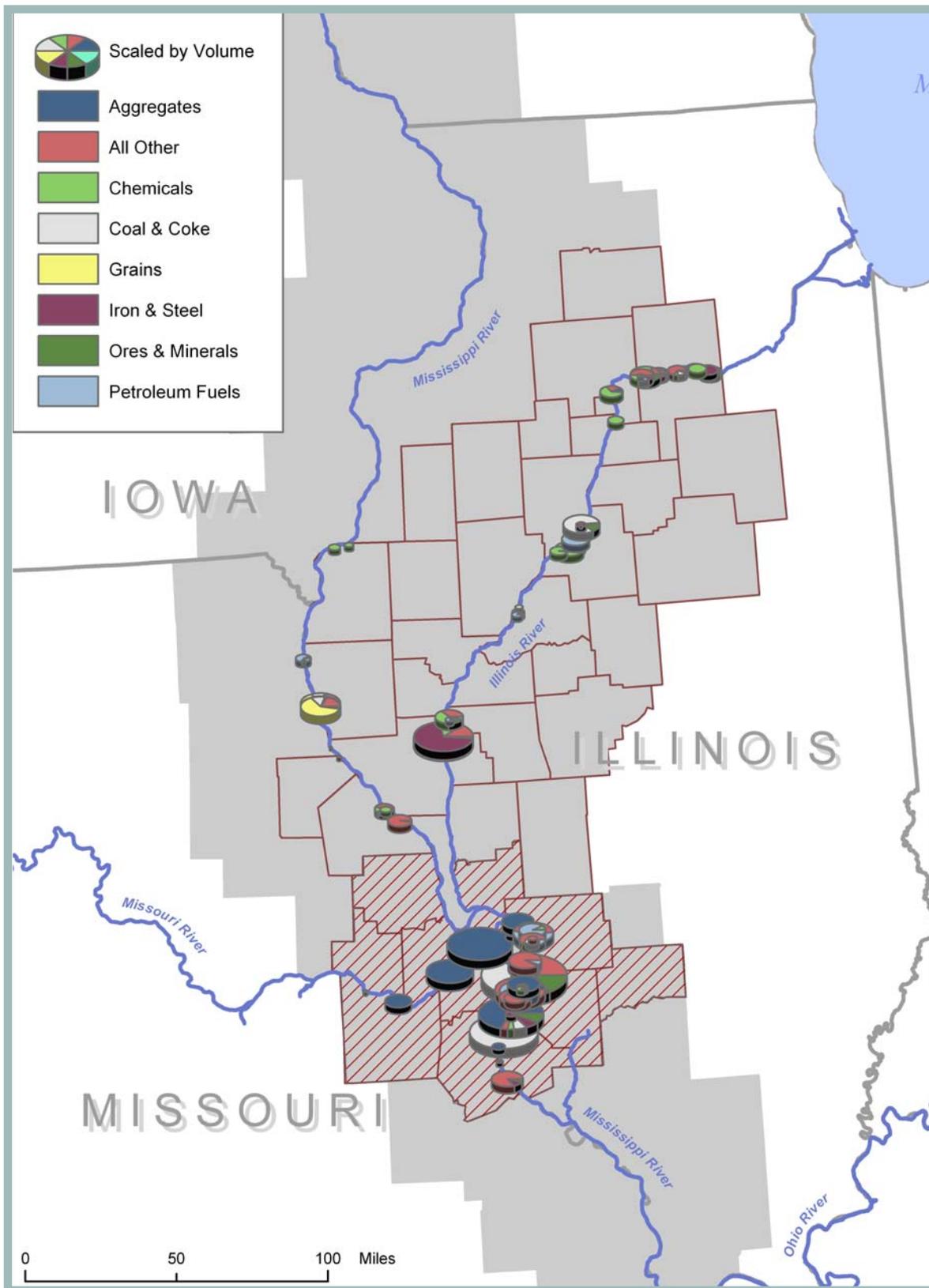


Figure 5-24: Study Area Commercial Airports



Figure 5-25: Upper Subarea Commercial Airports



Figure 5-26: Middle Subarea Commercial Airports

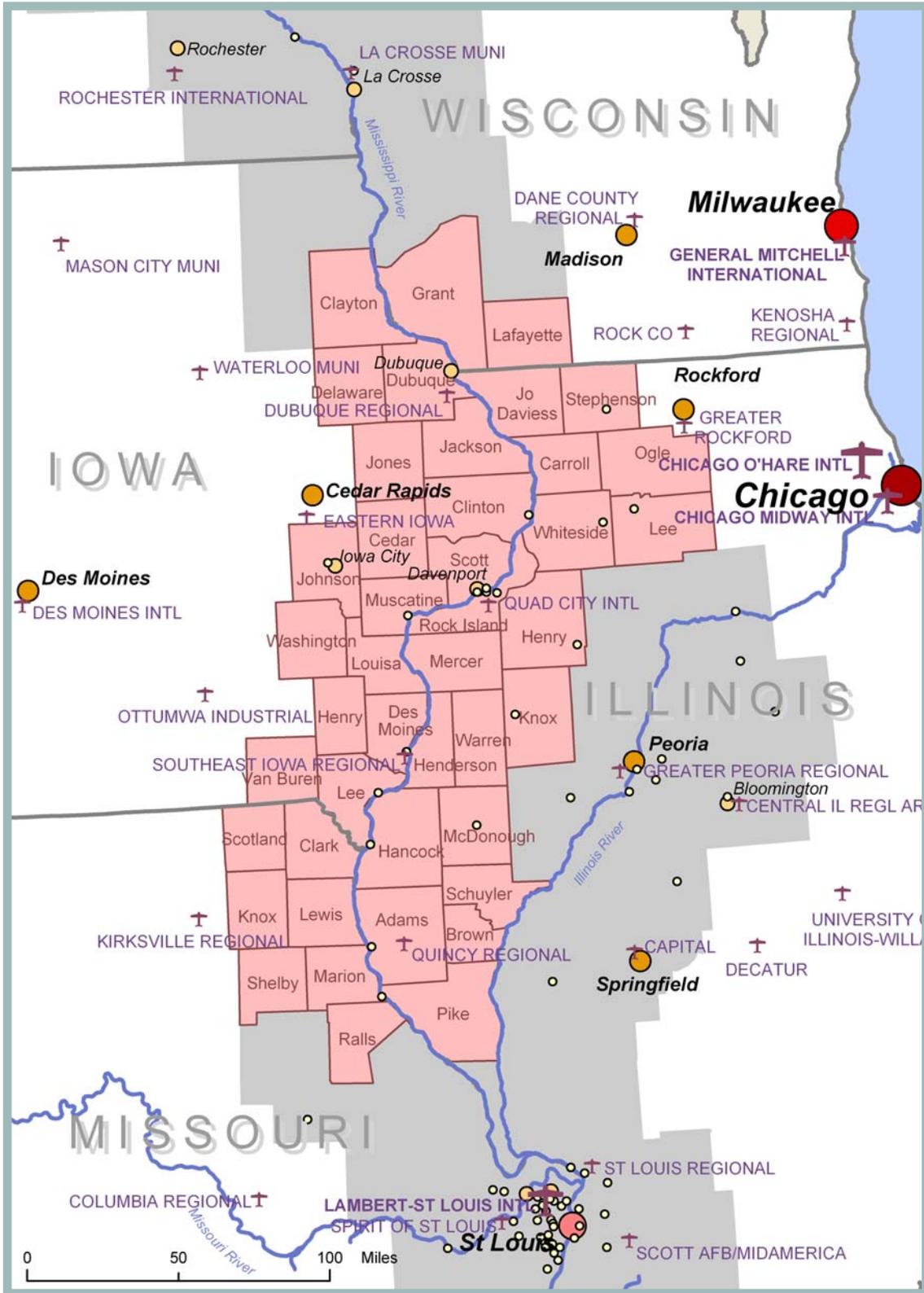
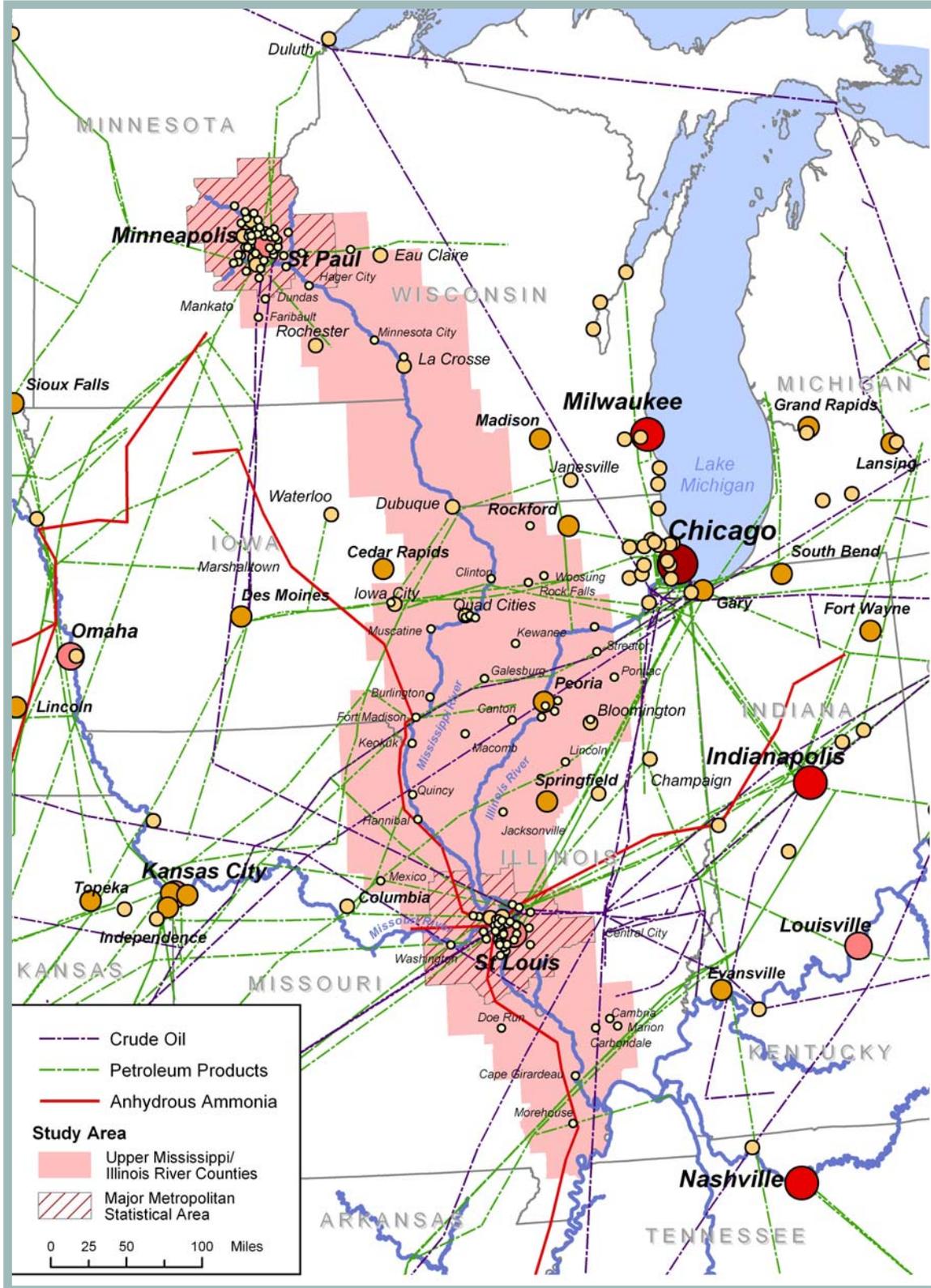




Figure 5-28: Illinois Subarea Commercial Airports



Figure 5-29: Study Area Pipeline Network



## Regional Trends in Transportation

In the summer of 2003, TVA conducted field interviews of barge terminal operators on the Upper Mississippi and Illinois Rivers and attended public meetings in the context of developing primary data for the study area analysis. Barge terminal operators, people from development and levee districts, and corn growers were surveyed. From these meetings and interviews, TVA collected some interesting observations and anecdotal evidence regarding the evolving agricultural business environment. This subsection chronicles those observations as they relate to transportation.

More grain farmers, particularly east of the Mississippi River, are building their own on-site grain storage. With on-site storage, the farmer may wait until later in the year to sell that year's harvest or sell some portion of the yield periodically over the course of the year. In conjunction with building their own silos, farmers are buying and using their own tractor-trailer trucks, working the farm in good weather, and doing the trucking in poor weather or the off-season. There are several reasons for the development of this trend. First, there is considerable reluctance on the part of the Class I railroads to provide less-than-unit train service in the region to haul grain either to a river port or to a rail yard for inclusion in a unit train (TVA, 2001). (Shortline railroads still provide this service north of Davenport, Iowa.)

Second, while some farmers still sell directly to the local grain elevator, many farmers have taken over the marketing and sales of their own grain allowing them a greater measure of control over the prices they receive. There are a number of options for farmers, particularly those with on-farm storage and their own truck. Local truck hires are typically economical only to about 35 miles from the farm, but owning their own truck allows farmers to take full advantage of all the options, including trucking around lock closures or ice in the winter. Those options include the local grain elevator or cooperative, or selling directly to a transload facility either on- or off-river, many of which are owned by large agribusiness interests like Archer Daniels Midland (ADM), Bunge, or Cargill. Ethanol plants are another option. Farmers gain a typical net premium of 5 cents per bushel by providing their own transportation.

There are several implications of this trend. The obvious is that there are more big trucks on the roads traveling greater distances from the farm. Weight and speed limits constrain the routes that these trucks can take, and increase wear and tear on those roads they can travel. In fact, for counties from the earlier Mid-America Port Study (TVA 2001) that had HPMS counts in both 1997 and 2001, truck traffic had increased significantly in most counties.

There is declining rail traffic to barge terminals and increasing truck traffic, although the farmer has the option of bypassing any lock closures or the river entirely if conditions are not favorable. In other words, the farmer's situation is strengthened, but the river terminal's situation has become more tenuous. This can only be exacerbated by aging waterway infrastructure, small lock chambers relative to today's tow size, and increasing delays at locks in the study area.

## Summary

The study area has all modes of transportation available—highway, rail, waterway, air, and pipeline. Access to modes varies slightly among the subareas, with the Middle Subarea having the least access and the Illinois Subarea having the greatest access.

The major commodities moved are agricultural products and coal. The Illinois Subarea ships and receives more than double the freight by rail as the other subareas. The Illinois Subarea also dominates in commodities moved by barge, although the Lower Subarea utilized the waterway almost as much in 2001. The Upper and Middle Subareas shipped or received less than half the volume of traffic via the waterway than the Illinois and Lower Subareas.

The Class I railroads, streamlined in the wake of mergers and track abandonment, carry a lot of cargo across the region and have become reluctant to pick up less than unit trainloads (65–150 cars). Shortline railroads continue to serve the farming community and provide rail-to-river service above Davenport, Iowa. However, there is a decline in rail-to-river service below Davenport. There is an increase in off-river transload facilities, particularly east of the Mississippi River.

Trucks fill the gap left by the railroads and, with on-farm storage, provide farmers with more options when marketing their grain. Increased truck traffic puts greater pressure on highway infrastructure in an area where alluvial soils and the climate already necessitate heavy annual investment. River terminals face increasing competition for grain traffic from truck-to-rail, multi-modal facilities and ethanol plants.



## Appendix

**Table A-1: Study Area Population**

	1990	2000	Percent Increase 1990-2000
Study Area	8,978,466	9,712,271	8.2
<b>Upper Subarea</b>	<b>3,591,427</b>	<b>4,098,649</b>	<b>14.1</b>
Upper Subarea outside Minneapolis-St. Paul	1,052,593	1,129,843	7.3
<b>Middle Subarea</b>	<b>1,474,916</b>	<b>1,514,235</b>	<b>2.7</b>
<b>Lower Subarea</b>	<b>3,379,395</b>	<b>3,527,386</b>	<b>4.4</b>
Lower Subarea outside St. Louis	886,870	923,779	4.2
<b>Illinois Subarea</b>	<b>3,854,411</b>	<b>4,016,779</b>	<b>4.2</b>
Illinois Subarea outside St. Louis	1,361,886	1,413,172	3.8
Illinois	11,430,602	12,419,293	8.6
Iowa	2,776,755	2,926,324	5.4
Minnesota	4,375,099	4,919,479	12.4
Missouri	5,117,073	5,595,211	9.3
Wisconsin	4,891,769	5,363,675	9.6
United States	248,709,873	281,421,906	13.2

Source: U.S. Department of Commerce, Bureau of the Census, Census of Population, 1990 and 2000.

**Table A-2: Rural Population in 2000**

	<b>Total Population</b>	<b>Rural Population</b>	<b>Percent Rural</b>
Study Area	9,712,271	2,360,325	24.3
<b>Upper Subarea</b>	<b>4,098,649</b>	<b>903,614</b>	<b>22.0</b>
Upper Subarea outside Minneapolis-St. Paul	1,129,843	544,499	48.2
<b>Middle Subarea</b>	<b>1,514,235</b>	<b>602,129</b>	<b>39.8</b>
<b>Lower Subarea</b>	<b>3,527,386</b>	<b>803,762</b>	<b>22.8</b>
Lower Subarea outside St. Louis	923,779	489,464	53.0
<b>Illinois Subarea</b>	<b>4,016,779</b>	<b>791,844</b>	<b>19.7</b>
Illinois Subarea outside St. Louis	1,413,172	477,546	33.8
Illinois	12,419,293	1,509,773	12.2
Iowa	2,926,324	1,138,892	38.9
Minnesota	4,919,479	1,429,420	29.1
Missouri	5,595,211	1,711,769	30.6
Wisconsin	5,363,675	1,700,032	31.7
United States	281,421,906	59,061,367	21.0

Source: U. S. Department of Commerce, Bureau of the Census, Census of Population, 2000.

Note: Rural population includes all persons not living in densely settled areas with a population of at least 2,500.

**Table A-3: Population Characteristics in 2000**

	Total Population	Percent Nonwhite	Percentage Hispanic or Latino	Percent High School Graduates (25 or Older)
Study Area	9,712,271	13.2	2.4	85.4
<b>Upper Subarea</b>	<b>4,098,649</b>	<b>11.3</b>	<b>2.8</b>	<b>89.2</b>
Upper Subarea outside Minneapolis-St. Paul	1,129,843	4.4	1.4	85.6
<b>Middle Subarea</b>	<b>1,514,235</b>	<b>6.9</b>	<b>3.4</b>	<b>84.1</b>
<b>Lower Subarea</b>	<b>3,527,386</b>	<b>18.0</b>	<b>1.4</b>	<b>81.5</b>
Lower Subarea outside St. Louis	923,779	7.4	1.1	76.2
<b>Illinois Subarea</b>	<b>4,016,779</b>	<b>17.1</b>	<b>1.7</b>	<b>83.6</b>
Illinois Subarea outside St. Louis	1,413,172	8.6	2.0	84.0
Illinois	12,419,293	26.5	12.3	81.4
Iowa	2,926,324	6.1	2.8	86.1
Minnesota	4,919,479	10.6	2.9	87.9
Missouri	5,595,211	15.1	2.1	81.3
Wisconsin	5,363,675	11.1	3.6	85.1
United States	281,421,906	24.9	12.5	80.4

Source: U.S. Department of Commerce, Bureau of the Census, Census of Population, 2000.

**Table A-4: Population by Age in 2000**

	Total Population	Percent Below 18	Percent 18 to 24	Percent 25 to 49	Percent 50 to 64	Percent 65 and older
Study Area	9,712,271	25.7	9.7	37.3	14.7	12.6
<b>Upper Subarea</b>	<b>4,098,649</b>	<b>26.3</b>	<b>9.8</b>	<b>39.0</b>	<b>14.1</b>	<b>10.9</b>
Upper Subarea outside Minneapolis-St. Paul	1,129,843	25.2	11.1	34.5	14.8	14.3
<b>Middle Subarea</b>	<b>1,514,235</b>	<b>24.5</b>	<b>10.3</b>	<b>34.7</b>	<b>15.6</b>	<b>14.9</b>
<b>Lower Subarea</b>	<b>3,527,386</b>	<b>25.7</b>	<b>9.1</b>	<b>36.5</b>	<b>15.0</b>	<b>13.6</b>
Lower outside St. Louis area	923,779	24.0	10.2	34.4	15.7	15.8
<b>Illinois Subarea</b>	<b>4,016,779</b>	<b>25.5</b>	<b>9.3</b>	<b>36.5</b>	<b>15.0</b>	<b>13.6</b>
Illinois Subarea outside St. Louis	1,413,172	24.2	10.3	35.2	15.4	14.9
Illinois	12,419,293	26.1	9.8	37.6	14.4	12.1
Iowa	2,926,324	25.1	10.2	34.9	15.0	14.9
Minnesota	4,919,479	26.2	9.6	37.8	14.4	12.1
Missouri	5,595,211	25.5	9.6	36.1	15.3	13.5
Wisconsin	5,363,675	25.5	9.7	36.9	14.8	13.1
United States	281,421,906	25.7	9.6	37.4	14.9	12.4

Source: U.S. Department of Commerce, Bureau of the Census, Census of Population, 2000.

**Table A-5: Economic Characteristics**

	Per Capita Personal Income 2001	Median Household Income 1999	Percent Below Poverty Level 1999	Unemployment Rate 2002	Labor Force 2002
Study Area	\$31,376	\$44,444	9.2	4.9	5,405,515
<b>Upper Subarea</b>	<b>34,783</b>	<b>50,080</b>	<b>7.4</b>	<b>4.4</b>	<b>2,480,064</b>
Upper Subarea outside Minneapolis-St. Paul	25,865	40,116	9.2	4.8	639,892
<b>Middle Subarea</b>	<b>25,604</b>	<b>38,378</b>	<b>10.2</b>	<b>5.2</b>	<b>819,297</b>
<b>Lower Subarea</b>	<b>29,860</b>	<b>40,943</b>	<b>11.0</b>	<b>5.4</b>	<b>1,806,429</b>
Lower Subarea outside St. Louis	21,885	32,396	14.1	5.6	448,318
<b>Illinois Subarea</b>	<b>30,610</b>	<b>42,995</b>	<b>9.9</b>	<b>5.3</b>	<b>2,100,466</b>
Illinois Subarea outside St. Louis	26,791	40,281	9.8	5.3	742,355
Illinois	32,990	46,590	10.7	6.5	6,378,000
Iowa	27,225	39,469	9.1	4.0	1,667,000
Minnesota	33,059	47,111	7.9	4.4	2,918,000
Missouri	28,221	37,934	11.7	5.5	2,990,000
Wisconsin	29,196	43,791	8.7	5.5	3,028,000
United States	30,413	41,994	12.4	5.8	144,863,000

Sources: U. S. Department of Commerce, Bureau of the Census, Census of Population, 2000; U. S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System; U. S. Department of Labor, Bureau of Labor Statistics; various state employment security agencies.

**Table A-6: Industrial Structure in 2001**

	Farming		Manufacturing	
	Percent of Total Employment	Average Earnings	Percent of Total Employment	Average Earnings
Study Area	2.6	\$ 8,016	11.3	\$47,949
<b>Upper Subarea</b>	<b>2.4</b>	<b>6,515</b>	<b>11.6</b>	<b>49,226</b>
Upper Subarea outside Minneapolis-St. Paul	7.4	7,585	13.6	40,103
<b>Middle Subarea</b>	<b>5.8</b>	<b>10,019</b>	<b>14.3</b>	<b>40,719</b>
<b>Lower Subarea</b>	<b>2.2</b>	<b>8,128</b>	<b>10.4</b>	<b>47,734</b>
Lower Subarea outside St. Louis	7.4	8,243	12.1	34,182
<b>Illinois Subarea</b>	<b>1.9</b>	<b>9,927</b>	<b>10.2</b>	<b>50,500</b>
Illinois Subarea outside St. Louis	4.3	10,623	10.6	46,778
Illinois	1.3	11,024	11.3	49,710
Iowa	5.6	13,122	12.8	41,404
Minnesota	2.9	7,572	11.7	46,867
Missouri	3.5	4,628	10.1	43,741
Wisconsin	2.9	5,463	16.8	44,001
United States	1.8	13,031	10.2	48,756

Source: U. S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.

**Table A-7: Top Ten Rail Freight Commodities in the Upper Subarea**

<b>Originating Commodities</b>	<b>Tons</b>	<b>Percent of Total</b>	<b>Excluding Major MSAs</b>	<b>Percent of Total</b>
Coal	155,301,554	38.6	0	0
Food and kindred products	50,509,992	12.6	14,879,880	32.0
Chemical, allied products	39,355,074	9.8	7,530,738	16.2
Farm products	35,852,684	8.9	2,861,424	6.1
Miscellaneous mixed shipments	26,941,040	6.7	0	0.0
Petroleum products	25,937,032	6.5	0	0.0
Nonmetallic minerals	20,890,241	5.2	11,507,120	24.7
Waste and scrap metals	11,910,744	3.0	1,269,120	2.7
Lumber/wood	9,229,840	2.3	3,479,160	7.5
Transportation equipment	6,643,468	1.7	586,428	1.3
<b>Terminating Commodities</b>				
Coal	478,319,669	57.1	43,701,166	34.7
Farm products	86,220,575	10.3	37,837,419	30.1
Chemicals, allied products	79,805,184	9.5	11,719,036	9.3
Lumber/wood	35,948,000	4.3	13,504,300	10.7
Food and kindred products	32,990,128	3.9	7,025,376	5.6
Miscellaneous mixed shipments	27,192,280	3.2	4,668,920	3.7
Clay, concrete, glass, stone	24,372,684	2.9	0	0.0
Pulp, paper, allied products	17,756,560	2.1	1,344,960	1.1
Transportation equipment	15,649,688	1.9	0	0.0
Primary metals	13,402,632	1.6	876,312	0.7

Source: STB, Carload Waybill Sample, 2001

**Table A-8: Top Ten Rail Freight Commodities in the Middle Subarea**

<b>Originating Commodities</b>	<b>Tons</b>	<b>Percent of Total</b>
Coal	113,557,332	37.1
Food and kindred products	79,222,496	25.9
Chemical, allied products	32,901,084	10.7
Primary metals	26,563,740	8.7
Nonmetallic minerals	15,704,332	5.1
Clay, concrete, glass, stone	14,454,512	4.7
Farm products	9,623,800	3.1
Waste and scrap metals	6,063,832	2.0
Petroleum, coal products	2,091,200	0.7
Transportation equipment	2,088,196	0.7
<b>Terminating Commodities</b>		
Coal	129,756,073	41.8
Farm products	68,866,312	22.2
Chemical, allied products	29,313,725	9.4
waste and scrap metals	25,621,632	8.2
Food and kindred products	25,245,368	8.1
Primary metals	10,513,628	3.4
Pulp, paper, allied products	4,841,220	1.6
Clay, concrete, glass, stone	3,554,320	1.1
Nonmetallic minerals	3,372,580	1.1
Petroleum, coal products	3,027,560	1.0

Source: STB, Carload Waybill Sample, 2001.

**Table A-9: Top Ten Rail Freight Commodities in the Lower Subarea**

<b>Originating Commodities</b>	<b>Tons</b>	<b>Percent of Total</b>	<b>Excluding Major MSAs</b>	<b>Percent of Total</b>
Coal	305,503,178	45.1	160,050,033	68.6
Transportation equipment	72,433,162	10.7	5,976,560	2.6
Chemicals, allied products	53,098,152	7.8	4,742,060	2.0
Primary metals	50,092,188	7.4	8,988,963	3.9
Food and kindred products	48,981,538	7.2	12,367,450	5.3
Miscellaneous mixed shipments	32,531,600	4.8	0	0.0
Clay, concrete, glass, stone	24,711,548	3.6	19,045,344	8.2
Farm products	23,617,544	3.5	15,792,380	6.8
Petroleum products	21,212,768	3.1	0	0.0
Waste and scrap metals	14,632,656	2.2	1,276,880	0.5
<b>Terminating Commodities</b>				
Coal	1,159,345,752	67.2	419,660,580	79.0
Food and kindred products	146,043,421	8.5	60,861,148	11.5
Farm products	83,872,069	4.9	19,859,168	3.7
Transportation equipment	75,108,255	4.4	4,379,624	0.8
Metallic ores	70,105,522	4.1	1,761,828	0.3
Chemical, allied products	68,516,124	4.0	9,432,096	1.8
Miscellaneous mixed shipments	26,436,400	1.5	0	0.0
Lumber, wood	20,225,120	1.2	0	0.0
Primary metals	19,428,052	1.1	0	0.0
Petroleum products	13,352,256	0.8	0	0.0

Source: STB, Carload Waybill Sample, 2001.

**Table A-10: Top Ten Rail Freight Commodities in the Illinois Subarea**

<b>Originating Commodities</b>	<b>Tons</b>	<b>Percent of Total</b>	<b>Excluding Total MSAs</b>	<b>Percent of Totals</b>
Coal	253,948,290	34.1	108,495,145	36.2
Chemicals, allied products	76,520,644	10.3	28,164,552	9.4
Transportation equipment	72,575,762	9.7	6,119,160	2.0
Food and kindred products	58,191,404	7.8	21,577,316	7.2
Farm products	56,811,606	7.6	48,986,442	16.3
Nonmetallic minerals	55,149,802	7.4	48,923,126	16.3
Primary metals	53,933,912	7.2	12,830,687	4.3
Miscellaneous mixed shipments	35,951,200	4.8	3,473,280	1.2
Petroleum products	21,504,448	2.9	0	0.0
Clay, concrete, glass, stone	19,824,072	2.7	14,157,868	4.7
<b>Terminating Commodities</b>				
Coal	928,807,640	61.1	189,122,468	58.3
Farm products	102,494,917	6.7	38,482,016	11.9
Food and kindred products	101,289,037	6.7	16,106,764	5.0
Chemical, allied products	88,634,813	5.8	29,550,785	9.1
Transportation equipment	72,692,667	4.8	0	0.0
Metallic ores	68,847,002	4.5	0	0.0
Primary metals	38,555,412	2.5	20,891,280	6.4
Miscellaneous mixed shipments	29,238,800	1.9	2,802,400	0.9
Lumber, wood	22,307,000	1.5	2,465,800	0.8
Waste and scrap metal	14,483,276	1.0	5,437,108	1.7

Source: STB, Carload Waybill Sample, 2001.

**Table A-11: Waterborne Freight in the Upper Subarea**

<b>Originating Commodities</b>	<b>Tons</b>	<b>Percent of Total</b>	<b>Excluding Total MSAs</b>	<b>Percent of Totals</b>
Grain	14,011,945	75.85	5,030,422	89.68
Aggregates	2,201,495	11.92	0	0.00
Chemicals	903,011	4.89	43,526	0.78
All other	636,548	3.45	74,068	1.32
Coal and Coke	463,555	2.51	461,400	8.23
Petroleum fuels	147,895	0.80	0	0.00
Iron and steel	107,577	0.58	0	0.00
Ores and minerals	0	0.00	0	0.00
<b>Total</b>	<b>18,472,026</b>	<b>100.00</b>	<b>5,609,416</b>	<b>100.00</b>
<b>Terminating Commodities</b>				
Coal and coke	3,396,177	26.33	1,255,472	52.71
Aggregates	3,360,334	26.05	1,497	0.03
Chemicals	2,631,586	20.40	512,971	21.54
Ores and minerals	1,900,023	14.73	416,271	17.48
All other	1,291,557	10.01	186,249	7.82
Iron and steel	169,214	1.31	1,497	0.06
Grains	107,748	0.84	1,400	0.06
Petroleum fuels	41,694	0.32	0	0.00
<b>Total</b>	<b>12,898,333</b>	<b>100.00</b>	<b>2,381,878</b>	<b>100.00</b>

Source: USACE WCSC, 2001.

**Table A-12: Waterborne Freight in the Middle Subarea**

<b>Originating Commodities</b>	<b>Tons</b>	<b>Percent of Total</b>
Grains	15,039,743	69.65
All other	4,074,884	18.87
Coal and coke	1,403,219	6.50
Aggregates	603,483	2.79
Chemicals	326,610	1.51
Ores and minerals	113,296	0.52
Iron and steel	30,975	0.14
Petroleum fuels	0	0.00
<b>Total</b>	<b>21,592,210</b>	<b>100.00</b>
<b>Terminating Commodities</b>		
Coal and coke	3,784,569	41.82
Chemicals	1,669,293	18.44
Aggregates	1,089,869	12.04
Ores and minerals	891,415	9.85
Grains	828,160	9.15
All other	600,912	6.64
Iron and steel	104,659	1.16
Petroleum fuels	81,839	0.90
<b>Total</b>	<b>9,050,716</b>	<b>100.00</b>

Source: USACE WCSC, 2001.

**Table A-13: Waterborne Freight in the Lower Subarea**

<b>Originating Commodities</b>	<b>Tons</b>	<b>Percent of Total</b>	<b>Excluding Total MSAs</b>	<b>Percent of Total</b>
Coal and Coke	18,945,334	41.46	7,340,341	50.80
Grains	13,916,914	30.46	4,210,465	29.14
All other	10,084,069	22.07	2,519,931	17.44
Petroleum fuels	1,053,146	2.30	14,528	0.10
Iron and steel	828,334	1.81	12,121	0.08
Chemicals	352,243	0.77	88,916	0.62
Aggregates	298,853	0.65	216,267	1.50
Ores and minerals	213,857	0.47	48,038	0.33
<b>Total</b>	<b>45,692,750</b>	<b>100.00</b>	<b>14,450,607</b>	<b>100.00</b>
<b>Terminating Commodities</b>				
Aggregates	4,228,277	24.05	226,031	6.15
All other	3,816,836	21.71	586,403	15.97
Coal and coke	2,334,218	13.28	57,835	1.57
Petroleum fuels	1,964,879	11.17	549,056	14.95
Chemicals	1,863,501	10.60	592,352	16.13
Iron and steel	1,704,209	9.69	1,218,013	33.16
Grains	1,081,352	6.15	301,714	8.21
Ores and minerals	589,840	3.35	141,613	3.86
<b>Total</b>	<b>17,583,112</b>	<b>100.00</b>	<b>3,673,017</b>	<b>100.00</b>

Source: USACE WCSC, 2001.

**Table A-14: Waterborne Freight in the Illinois Subarea**

<b>Originating Commodities</b>	<b>Tons</b>	<b>Percent of Total</b>	<b>Excluding Total MSAs</b>	<b>Percent of Total</b>
Grains	26,227,415	52.97	15,677,197	88.15
Coal and coke	11,257,974	22.74	2,800	0.32
All other	8,879,777	17.93	1,318,069	7.41
Petroleum fuels	1,033,943	2.09	1,983	0.01
Chemicals	1,001,056	2.02	737,729	4.15
Iron and steel	839,294	1.70	23,081	0.13
Ores and minerals	167,260	0.34	1,441	0.01
Aggregates	104,484	0.21	21,898	0.12
<b>Total</b>	<b>49,511,203</b>	<b>100.00</b>	<b>17,784,198</b>	<b>100.00</b>
<b>Terminating Commodities</b>				
All other	4,173,010	20.98	861,731	16.42
Aggregates	4,094,612	20.59	90,864	1.73
Chemicals	3,129,909	15.74	1,779,293	33.90
Coal and coke	2,788,128	14.02	224,785	4.28
Iron and steel	1,927,101	9.69	1,318,812	25.13
Petroleum fuels	1,739,173	8.75	323,350	6.16
Ores and minerals	1,230,701	6.19	628,447	11.97
Grains	804,574	4.05	21,528	0.41
<b>Total</b>	<b>19,887,208</b>	<b>100.00</b>	<b>5,248,810</b>	<b>100.00</b>

Source: USACE WCSC, 2001.

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# Glossary

<b>BTS</b>	Bureau of Transportation Statistics
<b>BNSF</b>	Burlington Northern Santa Fe Railway
<b>CWS</b>	Carload Waybill Sample
<b>CN</b>	Canadian National Railway Company
<b>FHWA</b>	Federal Highway Administration
<b>FRA</b>	Federal Railroad Administration
<b>HPMS</b>	Highway Performance Monitoring System
<b>IC&amp;E</b>	Iowa, Chicago & Eastern Railroad
<b>IMRL</b>	I & M Rail Link (now IC & E)
<b>MSA</b>	Metropolitan Statistical Area is a geographic entity defined by the Office of Management and Budget based on the concept of a core area with a large population, plus adjacent communities having a high degree of economic and social integration and at least 50,000 inhabitants or the presence of an urbanized area and a total population of at least 100,000.
<b>NTAD</b>	National Transportation Atlas Database
<b>NS</b>	Norfolk Southern Railroad
<b>Pool</b>	A reservoir created by a dam.
<b>Rural</b>	Territory, population, and housing units not classified as urban. "Rural" cuts across other hierarchies and can be in metropolitan or nonmetropolitan areas.
<b>STB</b>	Surface Transportation Board
<b>TVA</b>	Tennessee Valley Authority
<b>UP</b>	Union Pacific Railroad
<b>Urban</b>	All territory, population, and housing units in urbanized areas or in urban clusters. "Urban" classifications cut across other hierarchies and can be in metropolitan or nonmetropolitan areas.
<b>Urban area</b>	A general term referring to any area classified as either an urbanized area or an urban cluster.

**Urbanized area** An area consisting of a central place and adjacent territory with a general population density of at least 1000 people per square mile that have a minimum residential population of at least 50,000 people.

**Urban cluster** A densely settled territory that has 2,500 people but fewer than 50,000

**USACE** U.S. Army Corps of Engineers

**USDOT** U.S. Department of Transportation



400 West Summit Hill Drive  
Knoxville, Tennessee 37902