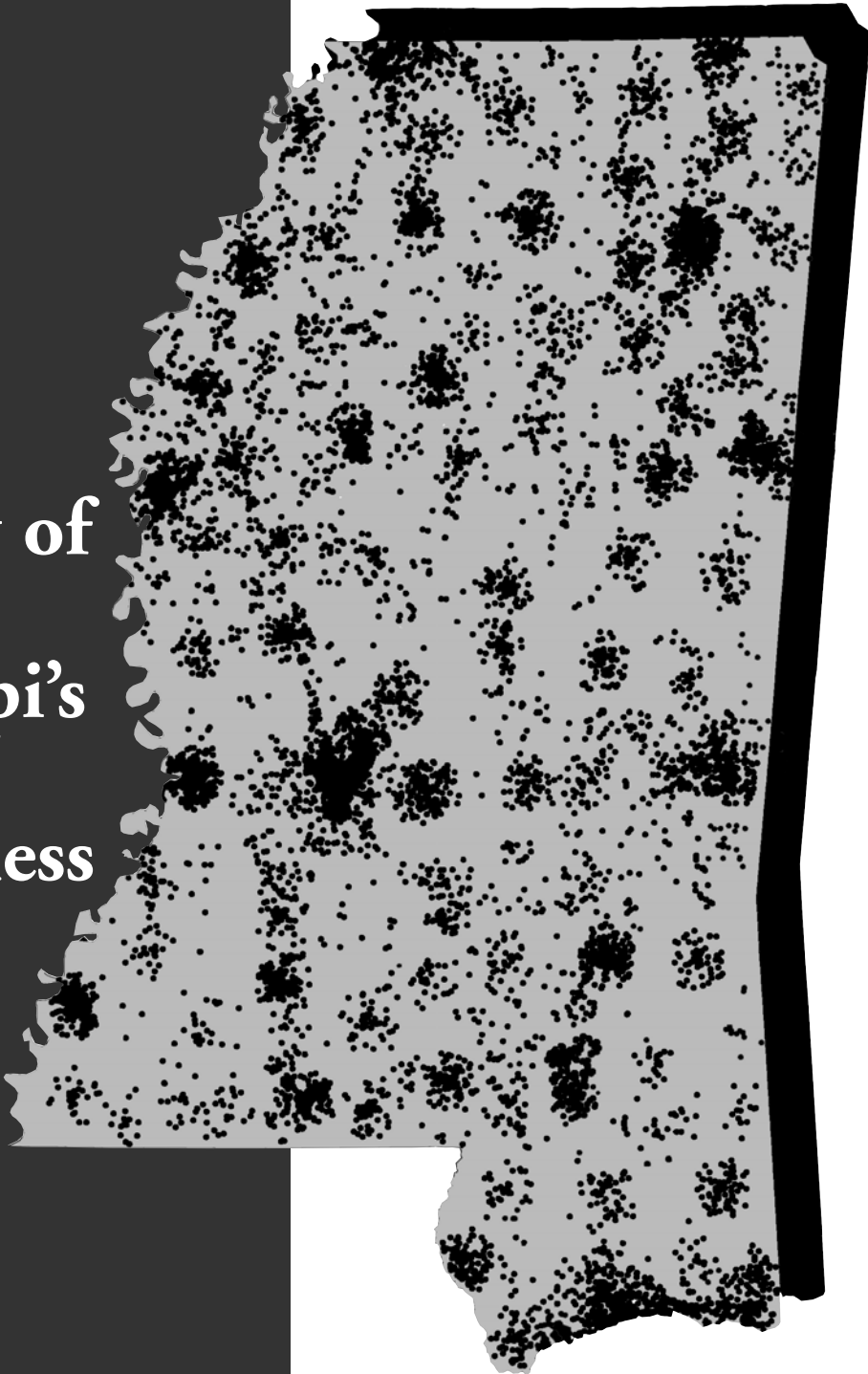


**A Spatial
Inventory of
Mississippi's
Agribusiness
Sector**



Experiment Station
Vance H. Watson, Director

Mississippi Agricultural & Forestry Experiment Station

Malcolm A. Portera, President • Mississippi State University • J. Charles Lee, Vice President

A Spatial Inventory of Mississippi's Agribusiness Infrastructure

David R. Parrish

Research Scientist
Social Science Research Center

Warren C. Couvillion

Economist
MSU Department of Agricultural Economics
National Center for Intermodal Transportation

Albert J. Allen

Professor
MSU Department of Agricultural Economics
National Center for Intermodal Transportation

For more information, contact Dr. Couvillion by telephone at (662) 325-2886 or by e-mail at couvillion@agecon.msstate.edu. This bulletin was published by the Office of Agricultural Communications, a unit of the Division of Agriculture, Forestry, and Veterinary Medicine at Mississippi State University. August, 2001

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A Spatial Inventory of Mississippi's Agribusiness Infrastructure

INTRODUCTION

The general business community has benefited from the application of spatial technologies in the examination of local and regional markets. The lack of standardized spatial data for Mississippi's agribusiness infrastructure has prevented similar investigations within Mississippi.

The initial development of several standardized spatial databases for Mississippi's agribusiness infrastructure was the objective of this study. Two source databases were combined to produce a single database with 12,944 records representing the *1999 Mississippi Agribusiness Inventory*. This report visually depicts the

geographic locations of agribusinesses within Mississippi, graphs employment and sales information about the agribusiness industry, and provides tables of county-specific information. The data gathered, manipulated, and visually portrayed will be useful to state leaders, decision-makers, and researchers in agribusiness planning, development, and decision-making. This collection of agriculture-related businesses might generate tangential research projects in agribusiness, as well as create the need to periodically update and augment the database for ongoing research efforts.

DATA BACKGROUND

The construction of a standardized set of spatial data layers for Mississippi's agribusiness infrastructure began by obtaining databases that included data relevant to the objective. In this search for relevant databases, two were found to have data sufficient for an accurate representation of the Mississippi agribusiness sector. The first database was the *1998 State Business Directory – Mississippi* by **American Business Directories, Inc.** This extensive database was purchased by the Social Science Research Center (SSRC) at Mississippi State University (MSU) and consisted of approximately 96,000 total entities, including trade, business, governmental, and nonprofit organizations within the state of Mississippi. A second database — *1999 Mississippi Manufacturers / Cross-Match Directory* by the **Mississippi Department of Economic and Community Development** — contains approximately 3,000 records and was obtained through the MSU Extension Service.

Each of these data sets contained agriculture-related businesses and information about each organization. However, as with most database designs, the data fields present in one data set were not included in the second data set or the data field types did not match. Nevertheless, the databases were manipulated, filtered through several iterations, and combined to produce a single data set with 12,944 Mississippi agribusiness organizations (12,492 records from the larger database and 452 records from the smaller database). The fields included came predominantly from the larger database and are listed below:

Name	SIC Code
Address	SIC Code Description
City	Number of Employees
Zip Code	Annual Sales
County	FIPS Number (County ID)
Telephone Number	Primary Line of Business

Since the smaller data set did not contain the same fields as the larger set, there are missing values for some organizations in terms of “Number of Employees” and “Annual Sales” data. In most cases involving governmental agencies, this type of data was not available.

Defining the subdivisions for Mississippi’s agribusiness sector required the use of another information source. The agribusiness sector is defined as the companies or organizations that perform activities pertaining to the production and marketing of food and agricultural fiber products. All businesses that produce various agricultural inputs, agricultural producers, and organizations that process and distribute agricultural products are encompassed by this definition. A paper written by David W. Hughes and R. Wes Harrison at the

Louisiana State University (LSU) Agricultural Center was used as the source for these categories. This paper, which is entitled *A Comparison of the Size and Location of Agribusiness Industries for Louisiana and Its Parishes: 1982 – 1992*, contained seven major categories for the division of Louisiana’s agribusiness sector. **Table 1** lists these seven categories, their respective subdivisions, and the associated SIC codes.

All spatially related data were obtained through the Mississippi Automated Resource Information System (MARIS), Environmental Systems Research Institute (ESRI), or from an SSRC spatial data collection. Examples of such data include congressional district boundaries, county boundaries, and zip code centroid (geographic center of zip code boundaries).

METHODOLOGY

To determine the spatial data layers developed in this study, MARIS and MSU Extension global information system (GIS) contacts were asked to provide guidance. These opinions directed the development of a data set including as many of the Mississippi agribusiness organizations as could be identified. The established data set was then subdivided according to Standard Industrial Classification (SIC) codes or North American Industrial Classification System codes. The resulting data set representing multiple spatial layers will serve as a basis for future development of agribusiness infrastructure information and research.

Drawing on the professional guidance, a search began for extant data sets that included Mississippi agribusiness organizations. As described in the “Data Background” section, the *1998 State Business Directory – Mississippi* and the *1999 Mississippi Manufacturers / Cross-Match Directory* were identified as sources of information on Mississippi’s agribusiness infrastructure. The first data set included approximately 96,000 Mississippi businesses, while the second consisted of approximately 3,000 Mississippi manufacturing businesses.

Before consolidating the data sets, a means of agribusiness identification had to be developed. The data sets had to be trimmed to include only the businesses that qualified as agribusinesses. The discovery of a study conducted by LSU scientists provided a basis for a classification system that accommodated this

need. This study — entitled *A Comparison of the Size and Location of Agribusiness Industries for Louisiana and Its Parishes: 1982–1992* — used seven categories to identify and subdivide the agribusiness sector in Louisiana; the categories are listed in **Table 1**.

Using Microsoft Access and the LSU classification system, the first data set was trimmed from 95,821 organizations to 12,492 agribusiness organizations. Likewise, the second data set was reduced from 3,073 to 1,067. Before combining the two data sets, duplicate entries were eliminated from the second data set. After eliminating these duplicates, 452 records from the second data set were added to the 12,492 records in the first set, forming a final data set of 12,944 Mississippi agribusiness organizations.

The data were converted to a dBase format for mapping in ESRI’s ArcView® GIS software. With this software package, agribusiness data layers were created using latitude and longitude coordinates, as well as zip code locations.

The first operation in the spatial layer development process was geocoding all 12,944 businesses. The term “geocode” is defined by ESRI as “[t]he process of identifying the coordinates of a location given its address. For example, an address can be matched against a TIGER street network to determine the location of a home. Also referred to as address geocoding.” (Source: <http://www.esri.com/library/glossary/glossary.html>). This geocoding process was a two-step operation. The

data set was geocoded using street-level address information; 2,945 organizations matched to street-level accuracy. The unmatched data were then geocoded to the zip-code-centroid level; 9,999 organizations matched to zip-code-level accuracy.

After completing the geocoding process, the visualization of the data was not considered to accurately represent the state's agribusiness infrastructure. The "dot-on-top-of-dot" phenomenon, resulting from geocoding to zip-code level, visually misrepresented the distribution of the agribusiness population. This circumstance created a need to randomly disperse the zip-code-level data to create a more accurate visual depiction. An ArcView® script was used to randomly distribute the points about each zip code centroid; however, the randomization process dispersed points outside the state boundary and outside some organizations' respective county boundaries. To correct this problem and produce points that would be accurate for county-level analysis, the outlying points were isolated and geocoded back to the original zip code center. This method of point dispersion allowed the zip-code-level data to be visualized more accurately while maintaining the integrity of the data at the county level.

The final step in the data development involved the visualization of the data with the creation of eight dot-density maps and two thematic maps. In the dot-density maps, one dot represents one organization. One of the dot-descriptive maps depicts the locations of all Mississippi agribusinesses, and the other seven represent the spatial distribution of various subdivisions of agribusiness within the state. The two thematic maps show the number of agribusinesses per county and number of agribusinesses per congressional district. These maps, along with supporting information charts, are located in the "Map and Chart Gallery" section.

Table 1. Standard Industrial Classification (SIC) Industries Designated as Agribusiness by Major Agribusiness Subsector.

Agribusiness subsector	1992 SIC Code
Farming, Fishing, and Agricultural Services:	
Farm Production (Farm Proprietors and Workers)	01-02
Agricultural Inputs:	
Agricultural Services	07
Chemical and Fertilizer Mining	147
Agricultural Chemicals	287
Farm Machinery and Equipment	3523
Wholesale Farm and Garden Machinery	5083
Commodity Contract Brokers, Dealers	6221
Land, Mineral, Wildlife Conservation	9512
Regulation of Agricultural Markets	964
Agricultural Processing:	
Meat Processing	201
Dairy Products	202
Canned and Frozen Fruits and Vegetables	203
Grain Mill Products	204
Bakery Products	205
Sugar and Confectionery Products	206
Fats and Oils Products	207
Beverages	208
Miscellaneous Food and Kindred Products	209
Tobacco Processing	21
Leather Tanning and Finishing	3111
Natural Fibers Textiles:	
Broadwoven Fabric Mills, Cotton	221
Broadwoven Fabric Mills, Wool	223
Narrow Fabric Mills	224
Natural Fiber Knitting Mills	2253-2259
Finishing Plants, Cotton and not classified elsewhere	2261, 2269
Carpets and Rugs	227
Yarn and Thread Mills	228
Coated Fabric, Not Rubberized	2295
Nonwoven Fabric	2297
Textile Goods, nec	2299
Food Wholesale and Retail Trade:	
Farm Product Warehousing and Storage	4221
Refrigerated Product Warehousing and Storage	4222
Groceries and Related Products Wholesale	514
Farm-Product Raw Material Wholesale	515
Beer, Wine, and Distilled Beverage Wholesale	518
Farm Supplies	5191
Flowers and Florists Supplies	5193
Tobacco and Tobacco Products Wholesale	5194
Retail Nurseries and Garden Stores	5261
Food Stores	54
Eating and Drinking Places	58
Liquor Stores	592
Forest Products:	
Lumber and Wood Products	24
Paper and Allied Products	26
Wood-Based Furniture and Fixtures:	
Wood and Upholstered Household Furniture	2511, 2512
Wood TV and Radio Cabinets	2517
Household Furniture, not classified elsewhere	2519
Wood Office Furniture	2521
Public Building and Related Furniture	2531
Wood Partitions and Related Furniture	2541
Furniture and Fixtures, not classified elsewhere	2599

COUNTY-LEVEL EXAMINATION

To provide a more detailed breakdown of the state's agribusiness infrastructure, county-level tables provide statistical figures associated with Mississippi agribusiness. **Table 2** illustrates the distribution of agribusinesses by county and major sector. **Table 3** pro-

vides information concerning the number of agribusiness organizations by county, by employee ranges. **Table 4** contains information detailing the number of agribusinesses by county, by annual sales ranges.

Table 2. Number of Mississippi Agribusiness Organizations by County and Major Sector.¹

County	Farming, fishing, & agricultural services	Agricultural inputs	Agricultural processing	Natural fibers textiles	Food wholesale & retail trade	Forest products	Wood-based furniture & fixtures	Total
Adams	2	23	10	0	160	17	0	212
Alcorn	2	14	5	2	139	17	3	182
Amite	2	3	2	0	39	6	0	52
Attala	3	6	4	0	74	9	2	98
Benton	1	6	1	0	21	3	1	33
Bolivar	15	51	4	1	135	2	1	209
Calhoun	2	14	1	0	62	10	6	95
Carroll	2	3	0	0	23	3	0	31
Chickasaw	6	13	2	1	78	21	49	170
Choctaw	0	4	1	0	20	7	0	32
Claiborne	3	4	1	0	43	6	0	57
Clarke	0	3	2	4	38	18	0	65
Clay	4	10	2	1	82	3	0	102
Coahoma	30	32	8	4	128	5	2	209
Copiah	5	9	2	0	94	13	1	124
Covington	2	8	1	0	44	6	0	61
DeSoto	9	55	4	1	239	12	4	324
Forrest	2	48	10	1	350	21	2	434
Franklin	2	6	0	0	14	5	0	27
George	1	13	2	0	62	5	0	83
Greene	1	1	0	0	35	8	0	45
Grenada	2	17	1	1	102	15	1	139
Hancock	1	11	0	0	122	3	1	138
Harrison	3	99	23	0	663	20	4	812
Hinds	13	152	26	2	1,053	55	3	1,304
Holmes	8	18	0	0	74	9	0	109
Humphreys	28	27	4	0	45	0	0	104
Issaquena	3	1	0	0	5	0	0	9
Itawamba	3	13	1	0	52	11	9	89
Jackson	2	57	10	0	351	9	2	431
Jasper	6	5	3	0	42	6	0	62
Jefferson	0	2	1	0	22	6	0	31
Jefferson Davis	1	5	1	0	35	3	0	45
Jones	6	27	13	0	215	22	2	285
Kemper	0	6	5	0	33	16	1	61
Lafayette	1	19	2	0	121	6	1	150
Lamar	1	12	2	0	52	12	0	79
Lauderdale	3	38	12	0	282	22	1	358
Lawrence	2	5	1	0	47	13	0	68
Leake	4	8	3	1	60	9	0	85
Lee	5	51	14	7	359	43	42	521
Leflore	6	51	9	16	138	3	0	223
Lincoln	4	20	2	0	110	18	0	154
Lowndes	1	37	8	3	239	18	2	308

¹Table 2 sources: 1998 State Business Directory – Mississippi, American Business Directories, Inc.; and 1999 Mississippi Manufacturers / Cross-Match Directory, Mississippi Department of Economic and Community Development.

Table 2 (cont.). Number of Mississippi Agribusiness Organizations by County and Major Sector.¹

County	Farming, fishing, & agricultural services	Agricultural inputs	Agricultural processing	Natural fibers textiles	Food wholesale & retail trade	Forest products	Wood-based furniture & fixtures	Total
Madison	10	55	8	0	251	15	8	347
Marion	1	13	3	0	88	14	1	120
Marshall	4	14	1	1	92	15	0	127
Monroe	6	23	7	0	110	11	15	172
Montgomery	3	11	1	0	48	9	1	73
Neshoba	3	13	2	0	69	15	0	102
Newton	7	10	3	0	70	11	1	102
Noxubee	4	10	1	0	49	9	0	73
Oktibbeha	4	25	10	0	112	14	1	166
Panola	8	25	5	3	112	6	2	161
Pearl River	3	29	4	1	131	9	0	177
Perry	1	2	0	0	33	8	1	45
Pike	1	19	8	0	170	22	2	222
Pontotoc	2	9	2	4	72	23	29	141
Prentiss	0	11	2	0	96	17	11	137
Quitman	9	19	3	0	37	1	0	69
Rankin	6	46	4	0	115	15	0	186
Scott	2	16	6	0	70	11	0	105
Sharkey	22	20	0	1	17	1	0	61
Simpson	3	13	2	0	78	8	0	104
Smith	1	3	3	1	46	10	0	64
Stone	1	9	1	0	46	14	0	71
Sunflower	24	35	8	5	82	3	0	157
Tallahatchie	12	23	0	0	48	4	0	87
Tate	9	17	0	0	56	1	3	86
Tippah	2	8	2	0	58	13	19	102
Tishomingo	0	7	0	0	73	14	13	107
Tunica	26	20	4	0	42	0	0	92
Union	4	11	2	0	68	9	13	107
Walthall	8	10	4	1	38	6	0	67
Warren	9	29	2	1	199	13	0	253
Washington	27	74	10	9	236	4	2	362
Wayne	0	9	2	0	58	10	0	79
Webster	1	9	0	0	31	6	2	49
Wilkinson	2	5	1	0	37	5	0	50
Winston	1	11	0	0	58	12	1	83
Yalobusha	2	8	1	0	41	2	0	54
Yazoo	17	36	3	1	101	16	0	174
Total	442	1,714	318	73	9,240	892	265	12,944

¹Table 2 sources: 1998 State Business Directory – Mississippi, American Business Directories, Inc.; and 1999 Mississippi Manufacturers / Cross-Match Directory, Mississippi Department of Economic and Community Development.

Table 3. Number of Mississippi Agribusiness Organizations by County and Number of Employees.¹

County	1-4	5-9	10-19	20-49	50-99	100-249	250+	N/A	Not given	Total
Adams	110	29	33	17	8	2	1	5	7	212
Alcorn	71	35	36	17	9	2	2	0	10	182
Amite	28	11	8	2	0	1	1	0	1	52
Attala	50	16	10	10	4	2	0	1	5	98
Benton	14	7	7	3	0	0	0	1	1	33
Bolivar	102	45	27	22	4	1	2	3	3	209
Calhoun	39	25	12	8	3	2	0	0	6	95
Carroll	19	8	2	0	1	0	0	0	1	31
Chickasaw	63	27	28	14	10	7	7	2	12	170
Choctaw	17	4	4	1	0	1	0	1	4	32
Claiborne	26	9	12	3	3	1	0	2	1	57
Clarke	33	5	10	5	1	2	2	0	7	65
Clay	54	22	8	11	2	2	1	1	1	102
Coahoma	99	32	40	23	7	4	0	0	4	209
Copiah	65	21	18	6	6	3	0	0	5	124
Covington	24	16	9	6	2	1	1	1	1	61
DeSoto	122	73	55	41	13	6	2	3	9	324
Forrest	147	89	91	69	15	8	3	1	11	434
Franklin	16	1	2	3	1	1	0	3	0	27
George	46	14	11	7	1	0	0	1	3	83
Greene	21	15	3	4	0	0	0	0	2	45
Grenada	73	21	14	16	5	3	1	2	4	139
Hancock	66	33	25	8	3	0	0	0	3	138
Harrison	375	151	97	105	46	17	2	4	15	812
Hinds	591	200	197	179	64	32	12	0	29	1,304
Holmes	54	22	19	8	2	1	1	2	0	109
Humphreys	59	20	12	9	1	1	1	1	0	104
Issaquena	6	2	1	0	0	0	0	0	0	9
Itawamba	31	14	17	10	4	1	0	2	10	89
Jackson	209	79	48	56	19	8	2	1	9	431
Jasper	35	8	9	5	2	0	1	0	2	62
Jefferson	17	7	4	1	1	0	0	0	1	31
Jefferson Davis	22	13	3	4	1	0	0	2	0	45
Jones	125	51	47	29	8	2	5	5	13	285
Kemper	32	8	2	1	0	1	0	1	16	61
Lafayette	55	31	28	20	10	0	0	2	4	150
Lamar	31	18	16	4	2	0	0	2	6	79
Lauderdale	158	67	53	42	16	9	3	1	9	358
Lawrence	35	13	8	5	0	1	1	1	4	68
Leake	44	10	16	9	0	1	1	0	4	85
Lee	188	102	87	63	32	13	7	3	26	521
Leflore	108	33	31	30	10	4	1	0	6	223
Lincoln	83	31	14	14	4	1	1	2	4	154
Lowndes	136	70	38	23	17	1	4	4	15	308
Madison	147	72	56	40	15	3	3	1	10	347
Marion	66	19	13	13	1	3	1	0	4	120
Marshall	62	25	21	10	2	2	0	1	4	127
Monroe	82	32	21	13	6	2	1	4	11	172
Montgomery	31	16	13	5	2	1	0	0	5	73
Neshoba	42	21	12	16	1	2	1	3	4	102
Newton	49	19	19	8	3	0	0	0	4	102
Noxubee	31	18	9	9	1	2	0	2	1	73
Oktibbeha	59	30	26	32	4	4	3	0	8	166
Panola	79	30	20	18	6	1	0	2	5	161
Pearl River	93	32	26	18	2	1	0	3	2	177
Perry	24	7	7	3	1	0	2	1	0	45
Pike	103	42	34	25	3	8	2	1	4	222
Pontotoc	50	31	12	15	8	5	5	0	15	141
Prentiss	65	24	13	19	3	1	2	2	8	137
Quitman	37	16	5	8	1	0	0	2	0	69
Rankin	92	35	19	24	5	3	1	0	7	186

¹Table 3 sources: 1998 State Business Directory – Mississippi, American Business Directories, Inc.; and 1999 Mississippi Manufacturers / Cross-Match Directory, Mississippi Department of Economic and Community Development.

Table 3 (cont.). Number of Mississippi Agribusiness Organizations by County and Number of Employees.¹

County	1-4	5-9	10-19	20-49	50-99	100-249	250+	N/A	Not given	Total
Scott	45	19	18	9	4	3	6	0	1	105
Sharkey	32	13	9	6	1	0	0	0	0	61
Simpson	51	20	14	10	2	3	0	0	4	104
Smith	31	11	7	7	2	1	1	1	3	64
Stone	35	12	11	4	3	0	1	0	5	71
Sunflower	80	30	22	14	2	2	3	1	3	157
Tallahatchie	48	16	9	10	0	0	0	1	3	87
Tate	42	23	9	6	1	1	1	0	3	86
Tippah	39	14	22	6	7	1	3	1	9	102
Tishomingo	50	19	19	9	1	2	1	0	6	107
Tunica	42	25	15	6	0	1	0	2	1	92
Union	42	14	19	14	3	2	3	2	8	107
Walthall	33	14	10	4	2	0	0	0	4	67
Warren	105	43	45	23	9	8	3	10	7	253
Washington	181	57	63	29	7	7	2	3	13	362
Wayne	38	15	11	6	6	0	0	1	2	79
Webster	20	10	11	4	1	1	1	0	1	49
Wilkinson	26	8	10	2	0	1	0	1	2	50
Winston	40	15	15	7	1	1	1	0	3	83
Yalobusha	30	8	8	4	0	0	2	0	2	54
Yazoo	91	29	22	16	7	2	1	0	6	174
Total	5,912	2,392	1,907	1,385	460	216	114	105	452	12,944

¹Table 3 sources: 1998 State Business Directory – Mississippi, American Business Directories, Inc.; and 1999 Mississippi Manufacturers / Cross-Match Directory, Mississippi Department of Economic and Community Development.

Table 4. Number of Mississippi Agribusiness Organizations by County and Sales Level (1997 Dollars).¹

County	Less than 500,000	500,000 - 1 million	1 - 2.5 million	2.5 - 5 million	5 - 10 million	10 - 20 million	20 - 50 million	More than 50 million	Not available	Not given	Total
Adams	124	37	14	9	4	5	4	1	7	7	212
Alcorn	109	21	15	5	11	4	3	1	3	10	182
Amite	28	7	7	5	1	0	0	1	2	1	52
Attala	52	12	12	6	5	2	1	0	3	5	98
Benton	16	7	2	5	0	0	0	0	2	1	33
Bolivar	119	37	23	9	6	5	2	2	3	3	209
Calhoun	48	11	13	7	5	2	1	0	2	6	95
Carroll	17	6	4	0	0	1	0	0	2	1	31
Chickasaw	70	22	25	10	14	5	8	1	3	12	170
Choctaw	18	1	5	1	0	0	1	0	2	4	32
Claiborne	31	9	5	2	4	2	1	0	2	1	57
Clarke	30	10	6	5	3	0	1	2	1	7	65
Clay	63	16	5	4	4	2	4	0	3	1	102
Coahoma	115	34	25	13	6	6	4	0	2	4	209
Copiah	68	21	16	2	6	3	1	0	2	5	124
Covington	29	13	8	3	2	1	1	1	2	1	61
DeSoto	161	73	43	13	9	4	5	3	4	9	324
Forrest	211	95	51	25	17	8	6	4	6	11	434
Franklin	12	5	1	3	1	1	0	0	4	0	27
George	54	8	7	5	2	1	1	0	2	3	83
Greene	24	11	5	1	2	0	0	0	0	2	45
Grenada	70	25	12	6	6	6	2	2	6	4	139
Hancock	100	18	13	1	3	0	0	0	0	3	138
Harrison	479	154	77	23	21	18	17	2	6	15	812
Hinds	732	234	145	58	21	28	25	12	20	29	1,304

¹Table 4 sources: 1998 State Business Directory – Mississippi, American Business Directories, Inc.; and 1999 Mississippi Manufacturers / Cross-Match Directory, Mississippi Department of Economic and Community Development.

Table 4 (cont.). Number of Mississippi Agribusiness Organizations by County and Sales Level (1997 Dollars).¹

County	Less than 500,000	500,000 - 1 million	1 - 2.5 million	2.5 - 5 million	5 - 10 million	10 - 20 million	20 - 50 million	More than 50 million	Not available	Not given	Total
Holmes	63	14	17	8	2	2	0	1	2	0	109
Humphreys	59	23	5	7	2	3	1	1	3	0	104
Issaquena	8	1	0	0	0	0	0	0	0	0	9
Itawamba	43	6	15	6	3	2	0	0	4	10	89
Jackson	256	81	37	13	12	8	5	1	9	9	431
Jasper	35	11	3	3	1	2	1	1	3	2	62
Jefferson	18	3	4	2	1	0	0	0	2	1	31
Jefferson Davis	23	12	3	3	1	1	0	0	2	0	45
Jones	143	51	36	15	8	7	1	5	6	13	285
Kemper	31	7	3	1	0	1	0	0	2	16	61
Lafayette	83	21	25	4	6	0	0	0	7	4	150
Lamar	42	13	8	4	1	2	1	0	2	6	79
Lauderdale	185	82	35	9	5	15	10	2	6	9	358
Lawrence	39	6	7	7	0	1	0	1	3	4	68
Leake	48	12	8	6	2	1	0	0	4	4	85
Lee	237	86	84	28	16	18	8	7	11	26	521
Leflore	125	31	21	11	11	7	3	1	7	6	223
Lincoln	85	30	15	4	7	3	0	1	5	4	154
Lowndes	169	54	28	12	10	9	2	2	7	15	308
Madison	201	57	44	14	5	4	6	1	5	10	347
Marion	70	22	9	3	4	4	2	0	2	4	120
Marshall	70	25	13	7	2	2	1	0	3	4	127
Monroe	87	23	22	10	5	4	1	0	9	11	172
Montgomery	36	12	10	2	4	1	0	0	3	5	73
Neshoba	46	20	13	9	2	1	2	0	5	4	102
Newton	48	20	16	6	5	1	0	0	2	4	102
Noxubee	29	14	9	8	1	4	1	1	5	1	73
Oktibbeha	73	39	26	4	3	4	3	2	4	8	166
Panola	86	32	13	8	5	4	1	0	7	5	161
Pearl River	113	28	18	5	4	3	0	0	4	2	177
Perry	20	10	5	5	1	0	0	2	2	0	45
Pike	118	33	24	17	8	6	7	1	4	4	222
Pontotoc	58	21	16	14	5	2	5	1	4	15	141
Prentiss	69	22	17	9	3	0	5	0	4	8	137
Quitman	35	16	10	3	0	1	0	1	3	0	69
Rankin	99	40	21	10	1	3	3	0	2	7	186
Scott	42	23	13	5	9	1	3	5	3	1	105
Sharkey	32	9	11	4	3	0	0	0	2	0	61
Simpson	58	16	10	6	3	2	1	2	2	4	104
Smith	32	9	6	5	2	1	1	2	3	3	64
Stone	36	14	8	1	2	1	1	1	2	5	71
Sunflower	86	20	28	7	2	5	1	0	5	3	157
Tallahatchie	51	7	15	4	3	0	1	0	3	3	87
Tate	45	15	13	4	0	2	0	0	4	3	86
Tippah	45	13	17	5	5	2	1	1	4	9	102
Tishomingo	59	13	14	6	2	1	2	0	4	6	107
Tunica	58	16	10	2	1	2	0	0	2	1	92
Union	49	15	17	4	3	2	4	0	5	8	107
Walthall	36	14	5	3	3	0	0	0	2	4	67
Warren	137	38	27	14	7	2	4	3	14	7	253
Washington	218	54	28	18	10	6	3	4	8	13	362
Wayne	39	14	10	5	5	2	0	0	2	2	79
Webster	20	9	8	3	4	1	1	0	2	1	49
Wilkinson	26	6	9	3	1	1	0	0	2	2	50
Winston	43	15	14	1	3	0	1	1	2	3	83
Yalobusha	27	10	7	2	2	0	0	2	2	2	54
Yazoo	102	23	17	7	11	2	2	1	3	6	174
Total	6,971	2,218	1,466	607	380	263	183	86	318	452	12,944

¹Table 4 sources: 1998 State Business Directory – Mississippi, American Business Directories, Inc.; and 1999 Mississippi Manufacturers / Cross-Match Directory, Mississippi Department of Economic and Community Development.

MAP AND CHART GALLERY

The cliché *A picture is worth a thousand words* deserves merit because there are an infinite number of circumstances in which visually enhanced data can be used as a more effective tool than can words or numbers. The recent explosion in the use of GIS technology can be attributed to this idea.

This section contains maps that illustrate the spatial characteristics of Mississippi's agribusiness infrastructure. Along with the maps that represent each respective agribusiness sector, there are bar graphs that define the sales ranges and number of employees for each sector layer.

Figure 1 is a thematic depiction of the number of agribusinesses in Mississippi. This figure graphically represents the same data that is displayed in Table 2.

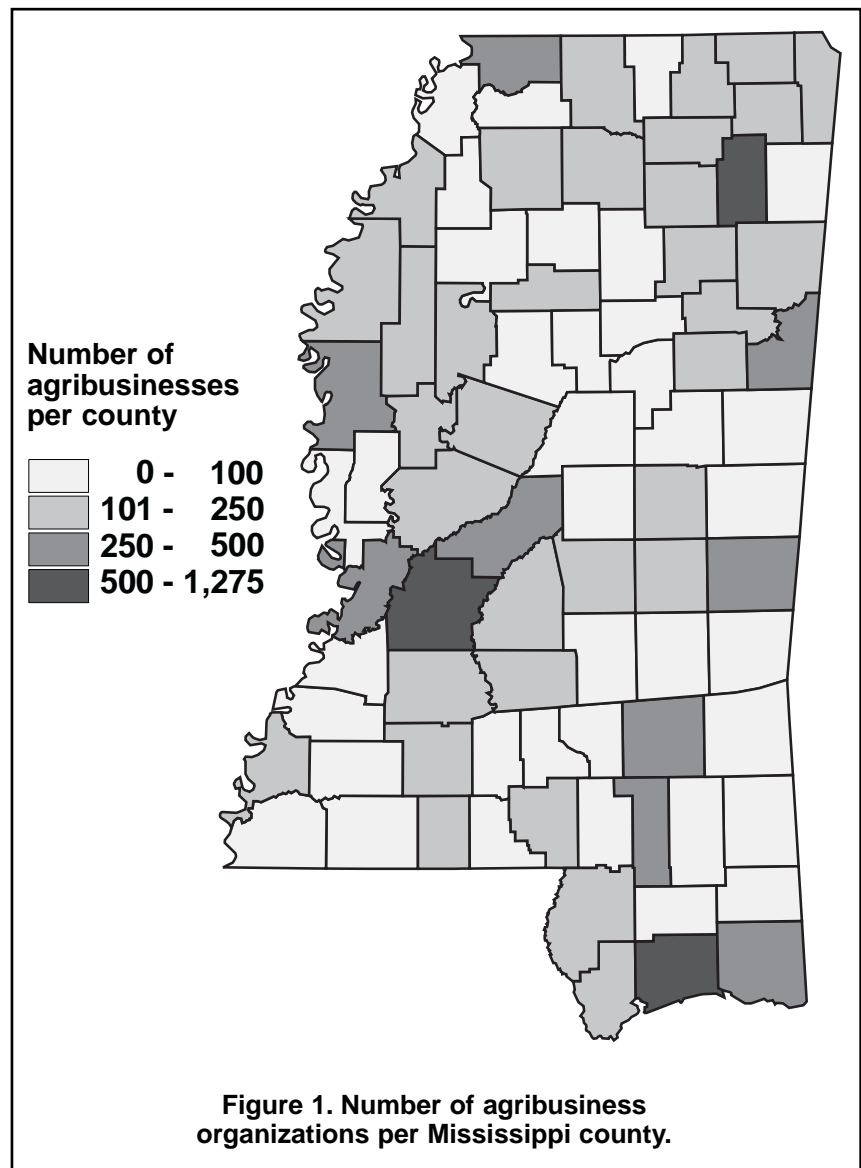
Figure 2 is a thematic illustration of the number of agribusinesses within each of Mississippi's U.S. congressional districts.

Figures 3-5 correspond to the entire Mississippi agribusiness infrastructure. Figure 3 is a dot-intensive map that represents the approximate locations of all agribusinesses in Mississippi. Figures 4 and 5 demonstrate the distribution of agribusiness sales and employment ranges for the entire agribusiness sector. These charts show that nearly half of the organizations have one to four employees, and more than half have sales figures of less than \$500,000 per year.

Figures 6-26 contain the same type and depth of information as Figures 3-5. These figures (in groups of three) describe the subclasses of agribusinesses within the state. Each set of three contains one dot-density map portraying the business locations of each subclass and two bar charts delineating sales and employment statistics for each subsector.

Figures 6-8 represent information pertaining to the first subclass of Mississippi agribusiness: *Farming, Fishing and Agricultural Services* (SIC Codes 0100s and 0200s). This category contains 442 organizations and comprises almost 3.5% of Mississippi's agribusiness infrastructure. Examples of this subclass include Sanderson Farms, Cal-Maine Egg Products, Inc., Dairy Fresh Corporation, and Bee Lake Partners.

Figures 9-11 portray information associated with the second subclass of Mississippi agribusiness: *Agricultural Inputs* (SIC Codes 0700s, 1470s, 2870s, 3523, 5083, 6221, 9512, and 9640s). Company exam-



ples in this category include Mississippi Chemical Corporation, Warren, Inc., and Magnolia Tree Company. This subclass represents approximately 13.2% of agribusiness with 1,714 Mississippi businesses.

Figures 12-14 depict data corresponding to the third subclass of Mississippi agribusiness: *Agricultural Processing* (SIC Codes 2010s, 2020s, 2030s, 2040s, 2050s, 2060s, 2070s, 2080s, 2090s, 2100s, and 3111). This subclass is the second smallest agribusiness sector with 318 represented organizations accounting for only 2.5% of the agribusiness infrastructure. Sanderson Farms, Wayne Farms, and Bryan Foods, Inc., are a few of the more easily recognized names in this agricultural class.

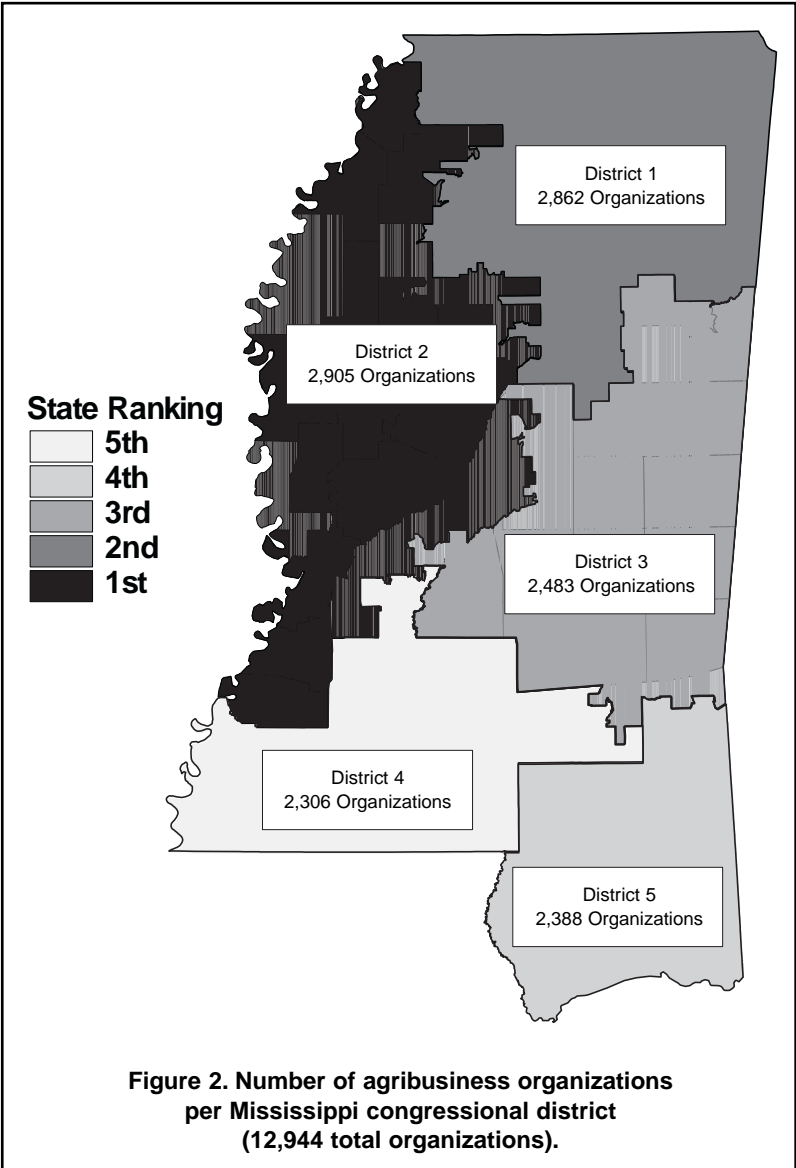
Figures 15-17 describe details about the fourth and smallest subclass of Mississippi agribusiness: *Natural Fibers Textiles* (SIC Codes 2210s, 2230s, 2240s, 2253–2259, 2261, 2269, 2270s, 2280s, 2295, 2297, and 2299). GenCorp, U.S. Axminster, and Burlington Sportswear are among the 73 organizations in this subclass, which comprises less than 1% of Mississippi’s agribusiness infrastructure.

Figures 18-20 represent the fifth and largest subclass of Mississippi agribusiness: *Food Wholesale and Retail Trade* (SIC Codes 4221, 4222, 5140s, 5150s, 5180s, 5191, 5193, 5194, 5261, 5400s, 5800s, 5920s, 5992, and 5993). More than 71% of Mississippi’s agribusiness sector (9,240 organizations) falls under the Food Wholesale and Retail Trade category. Household names such as Jitney Jungle and Tyson Foods are included in this subclass, but a majority of the subclass consists of small convenience stores, restaurants, and other small retail stores with agricultural associations.

Figures 21-23 portray information from the sixth subclass of Mississippi agribusiness: *Forestry Products* (SIC Codes 2400s and 2600s). Approximately 6.9% of Mississippi’s agribusiness or 892 businesses can be attributed to Forestry Products, and well-known names in this arena include International Paper, Weyerhaeuser, and Georgia Pacific.

Figures 24-26 present details about the seventh and last subclass of Mississippi agribusiness in this study: *Wood-Based Furniture and Fixtures* (SIC Codes 2511, 2512, 2517, 2519, 2521, 2531, 2541, and 2599). Action Industries, River Oaks Furniture, and Johnston Tombigbee are examples of the 265 businesses that are predominately found in the northeastern portion of the state and account for 2% of Mississippi agribusiness.

NOTE: Sources for Figures 1-26 are the 1998 State Business Directory - Mississippi by American Business Directories, Inc., and the 1999 Mississippi Manufacturers / Cross-Match Directory by the Mississippi Department of Economic and Community Development.



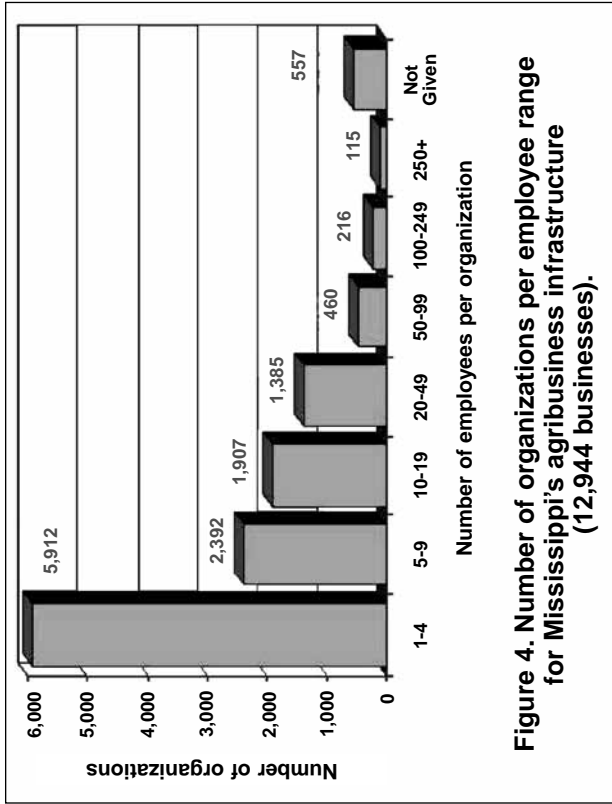


Figure 4. Number of organizations per employee range for Mississippi's agribusiness infrastructure (12,944 businesses).

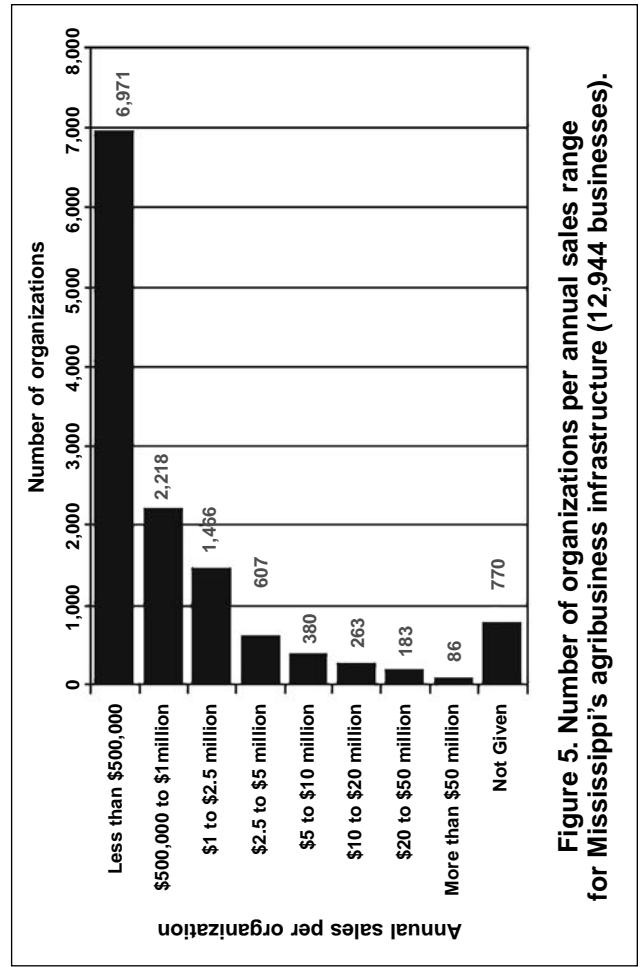


Figure 5. Number of organizations per annual sales range for Mississippi's agribusiness infrastructure (12,944 businesses).

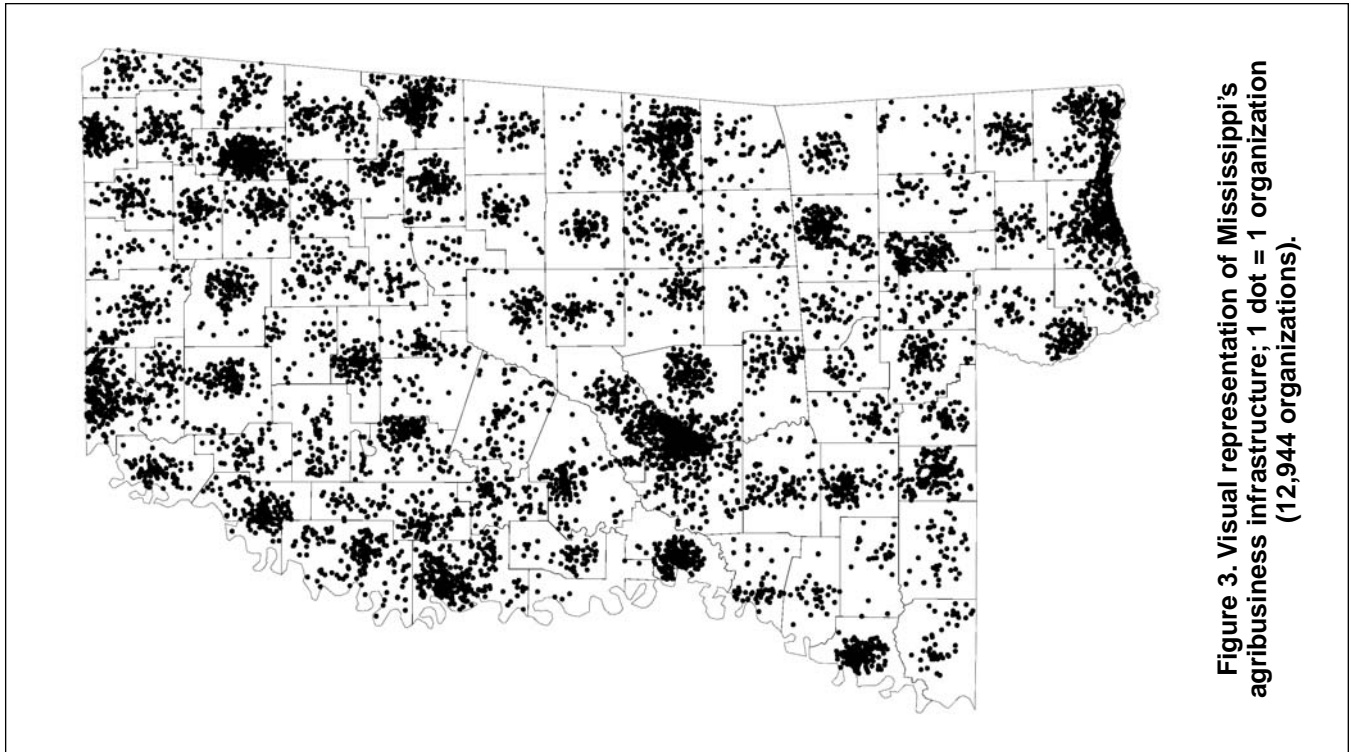


Figure 3. Visual representation of Mississippi's agribusiness infrastructure; 1 dot = 1 organization (12,944 organizations).

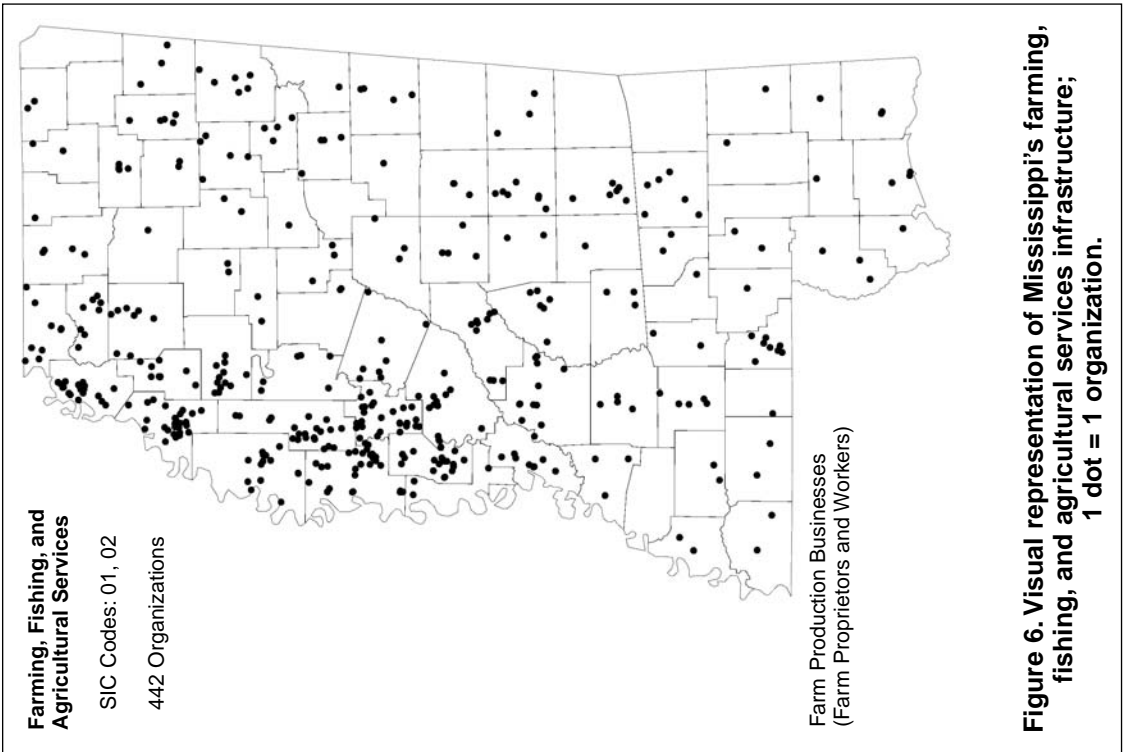


Figure 6. Visual representation of Mississippi's farming, fishing, and agricultural services infrastructure; 1 dot = 1 organization.

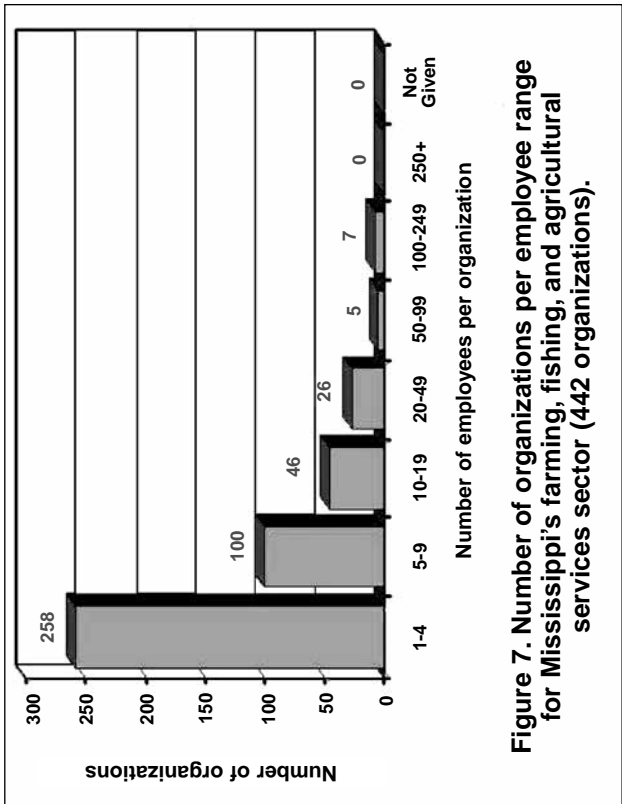


Figure 7. Number of organizations per employee range for Mississippi's farming, fishing, and agricultural services sector (442 organizations).

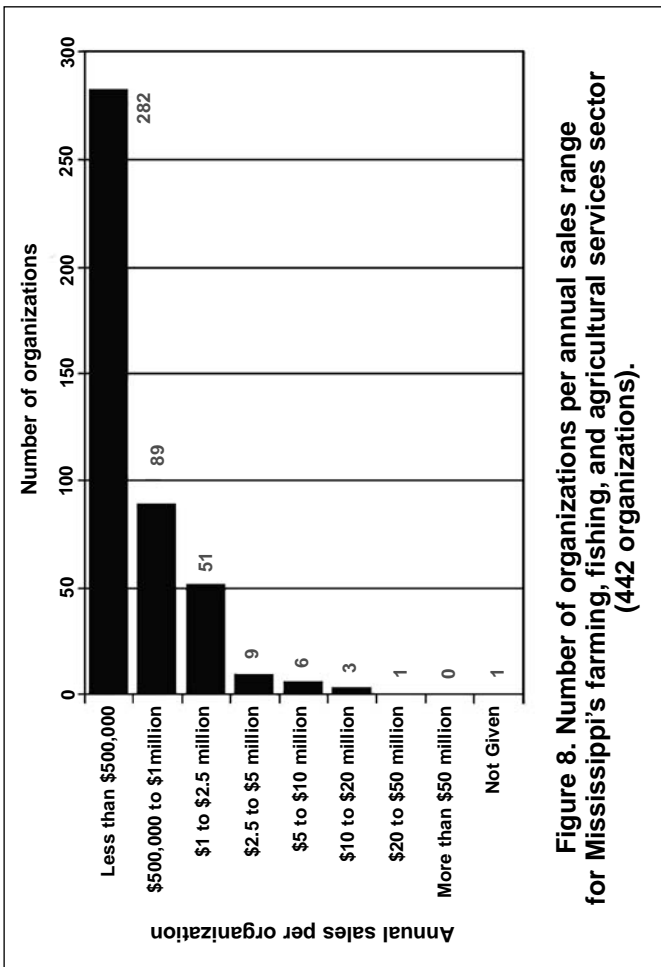
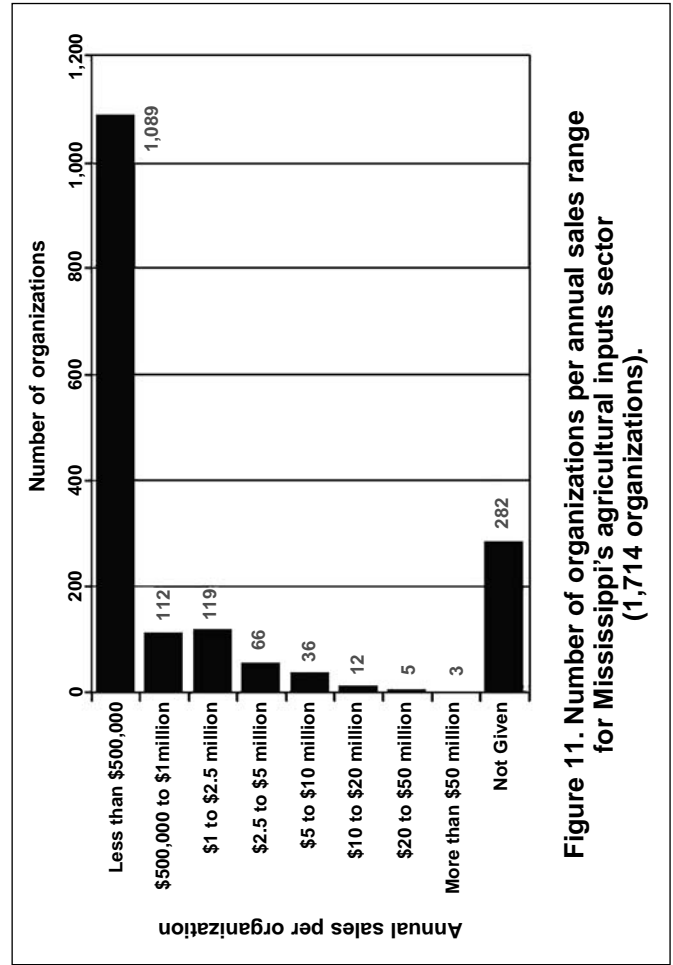
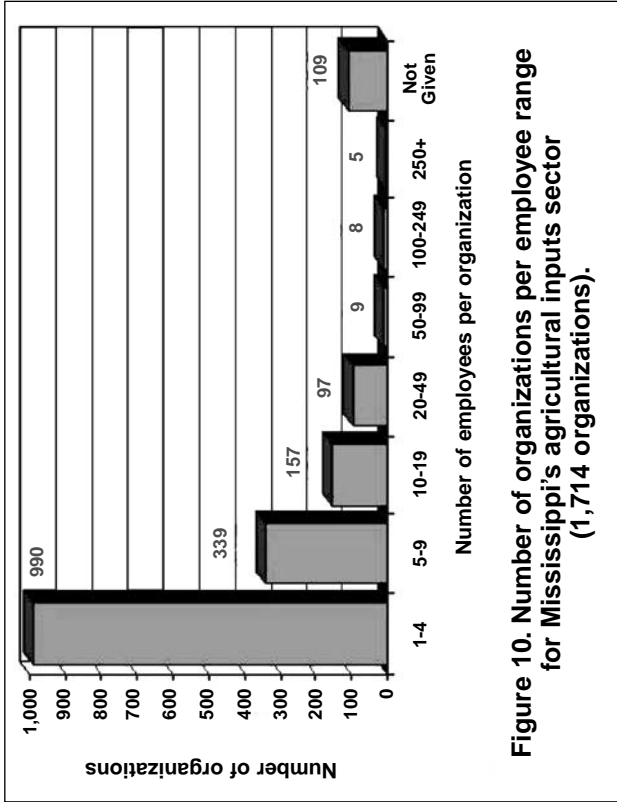
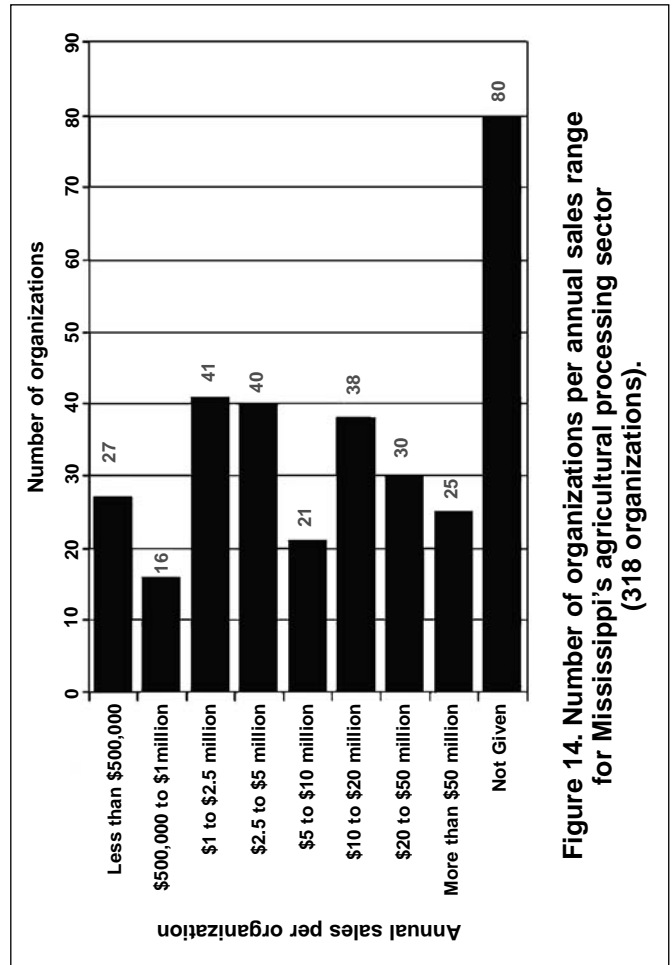
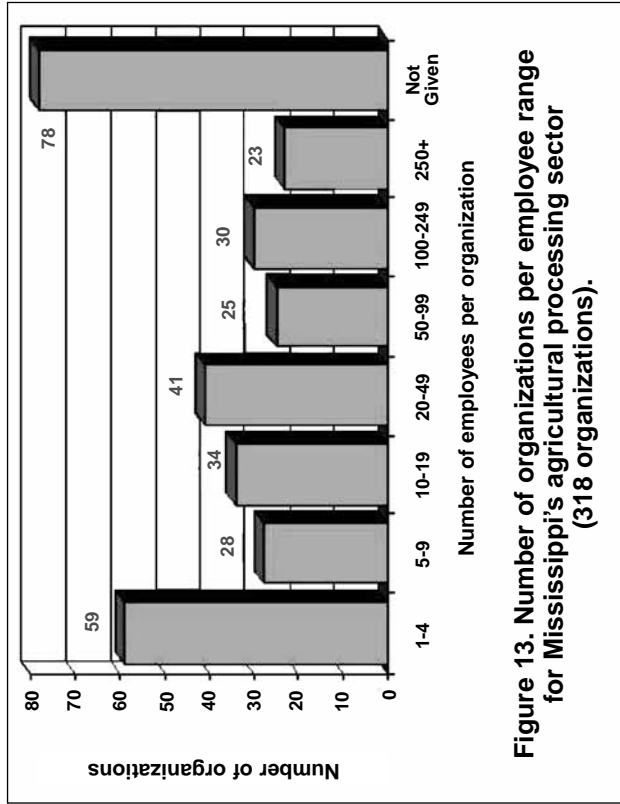
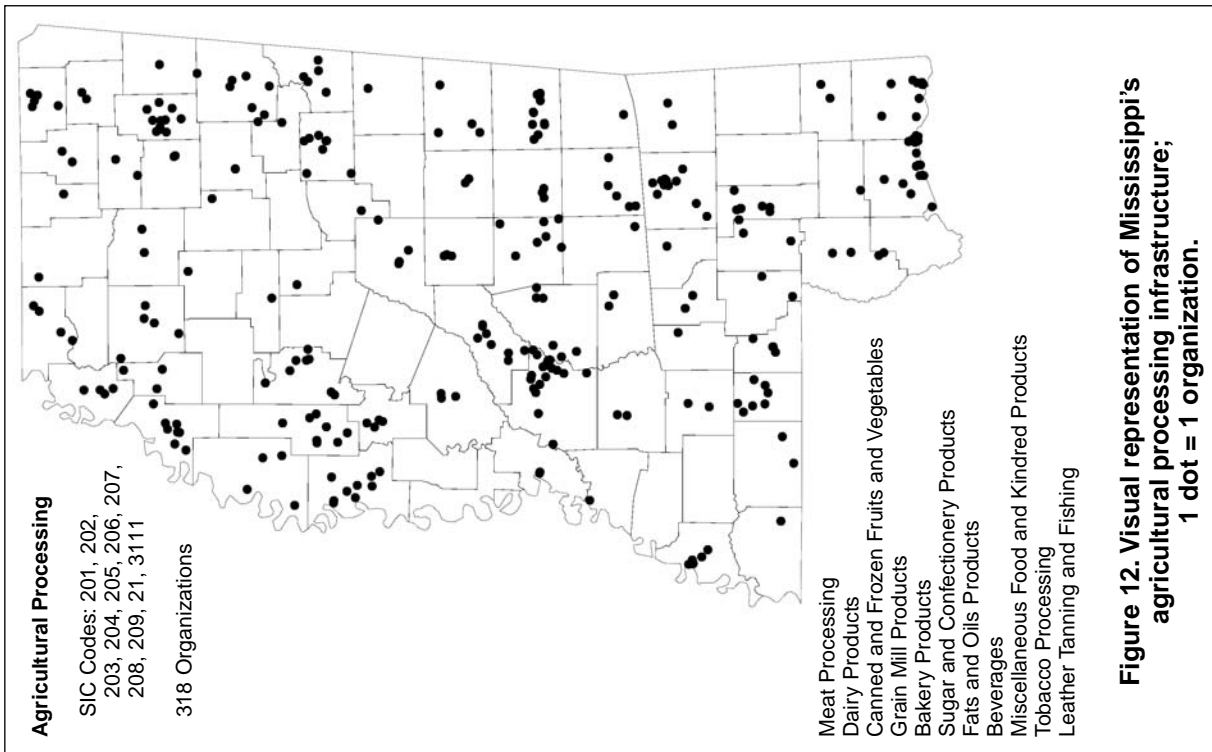
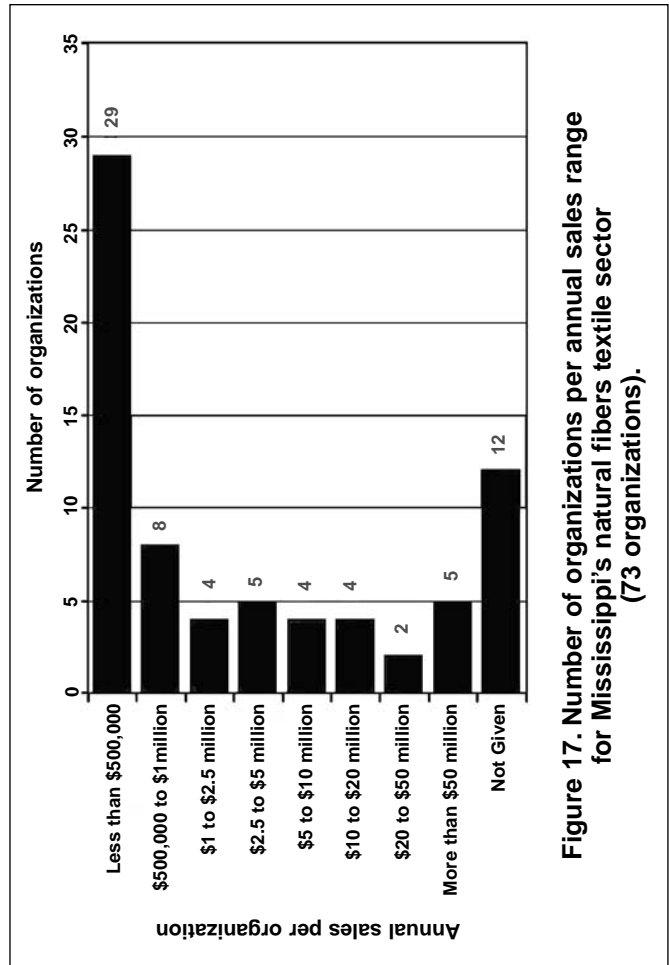
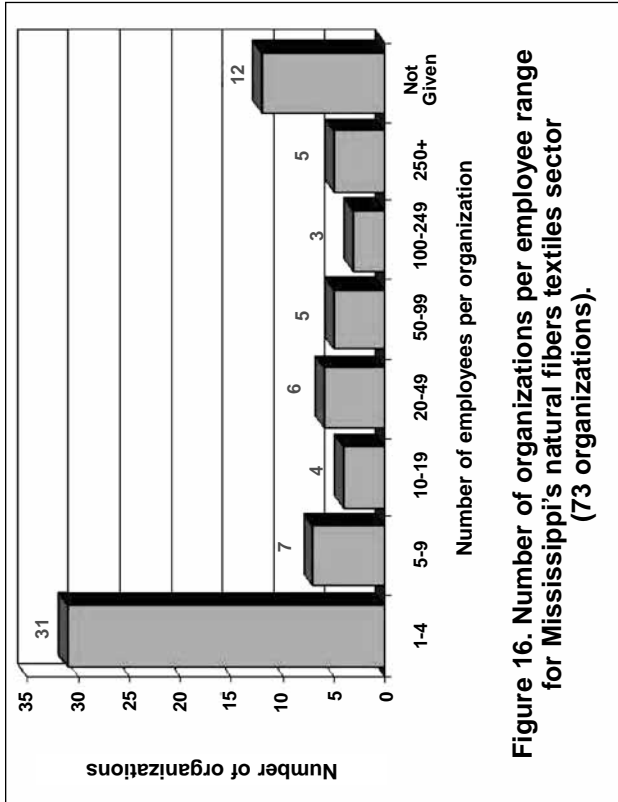
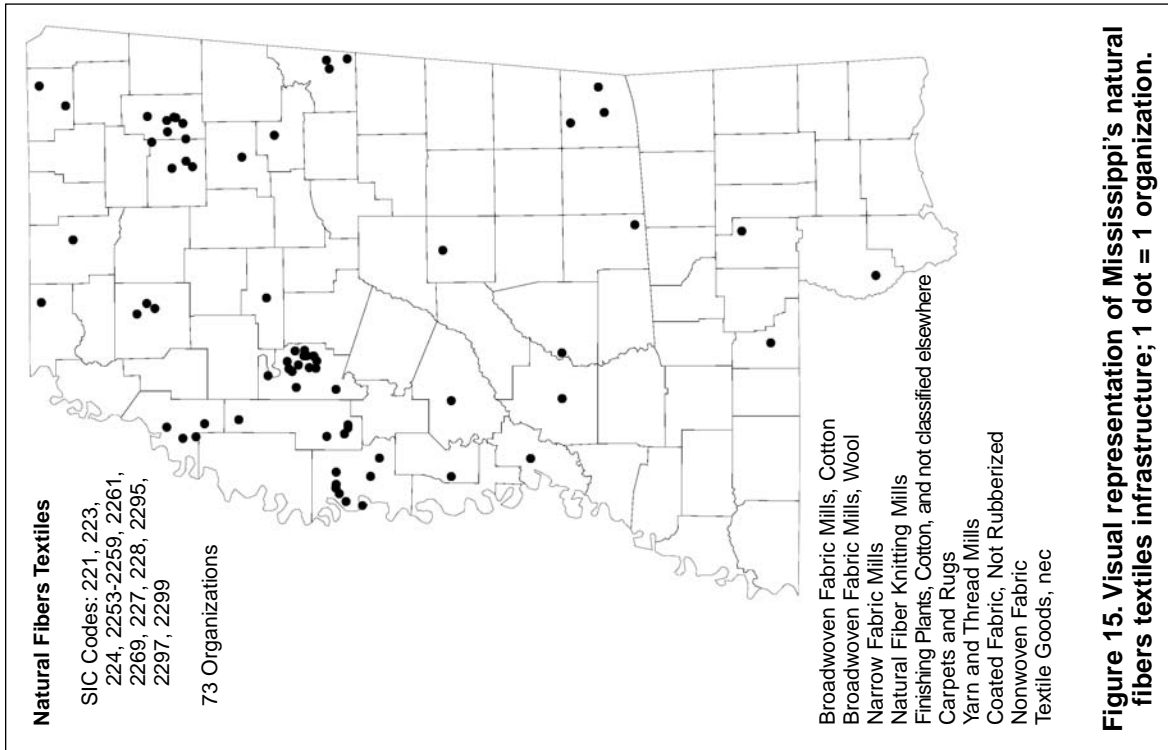
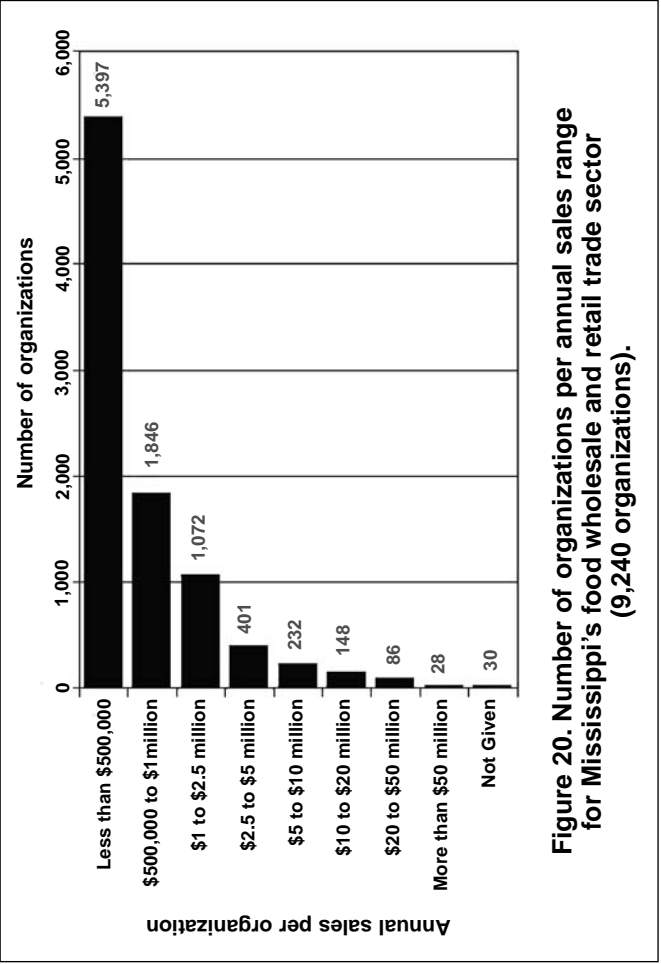
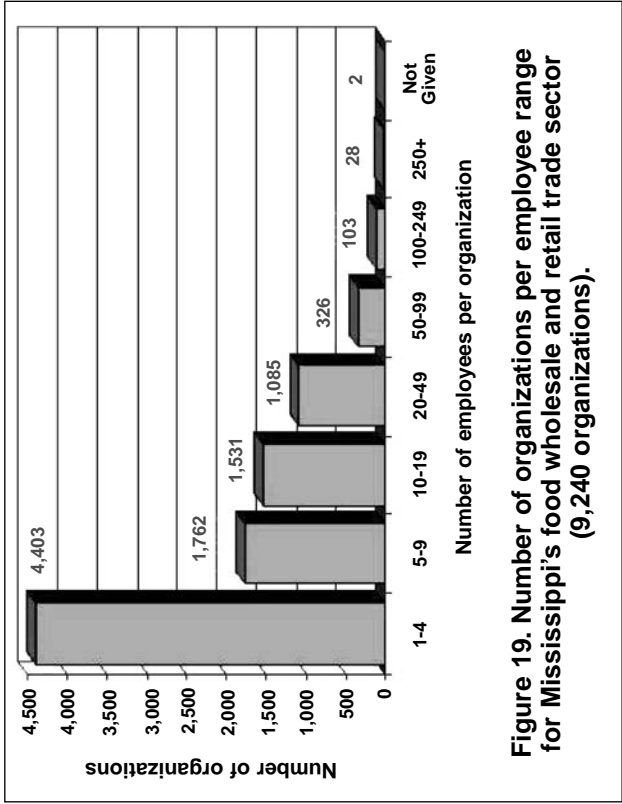
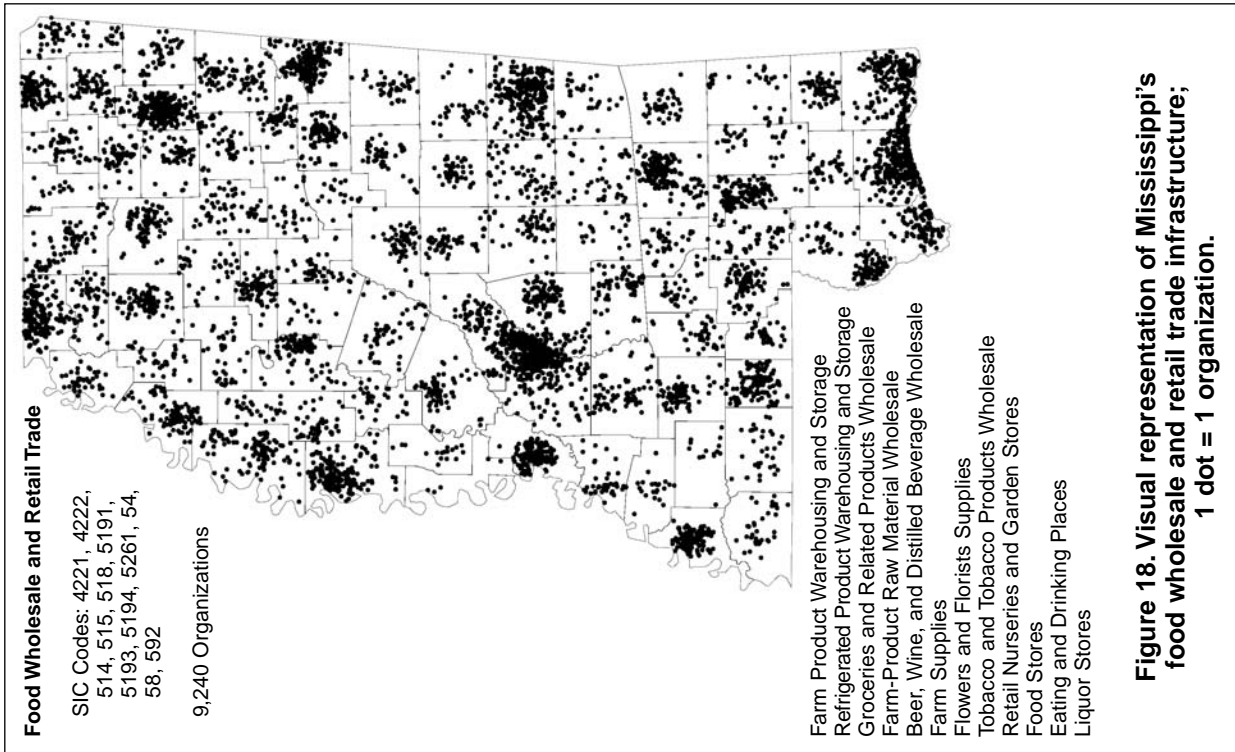


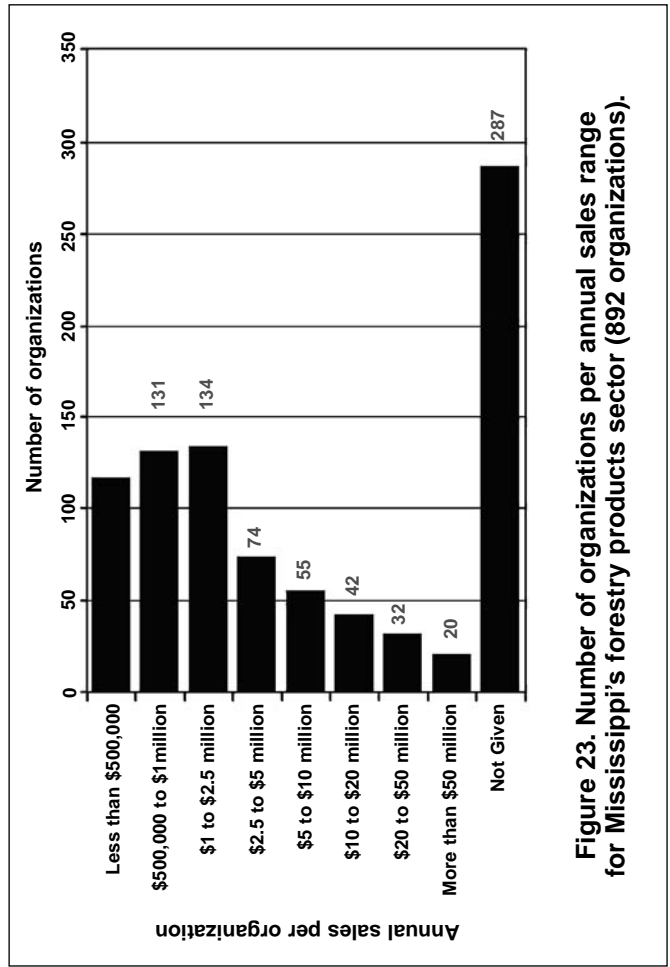
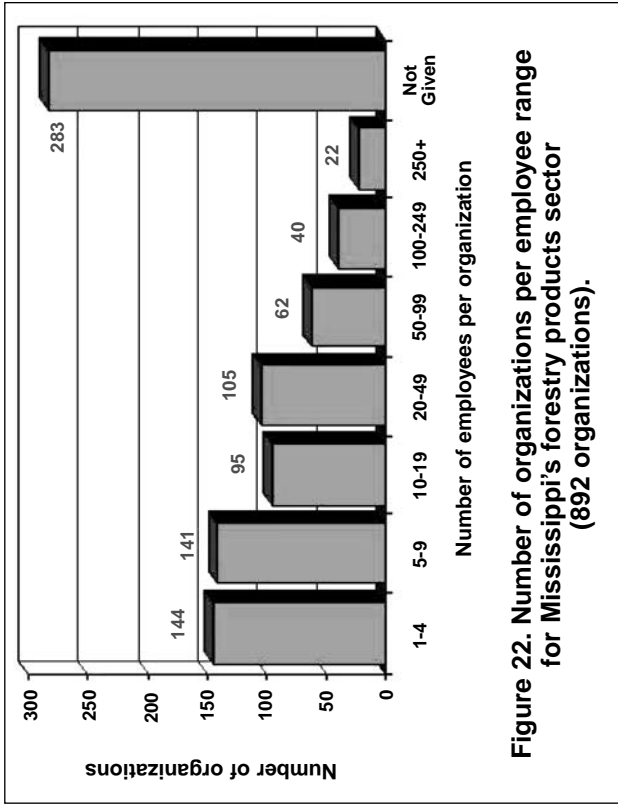
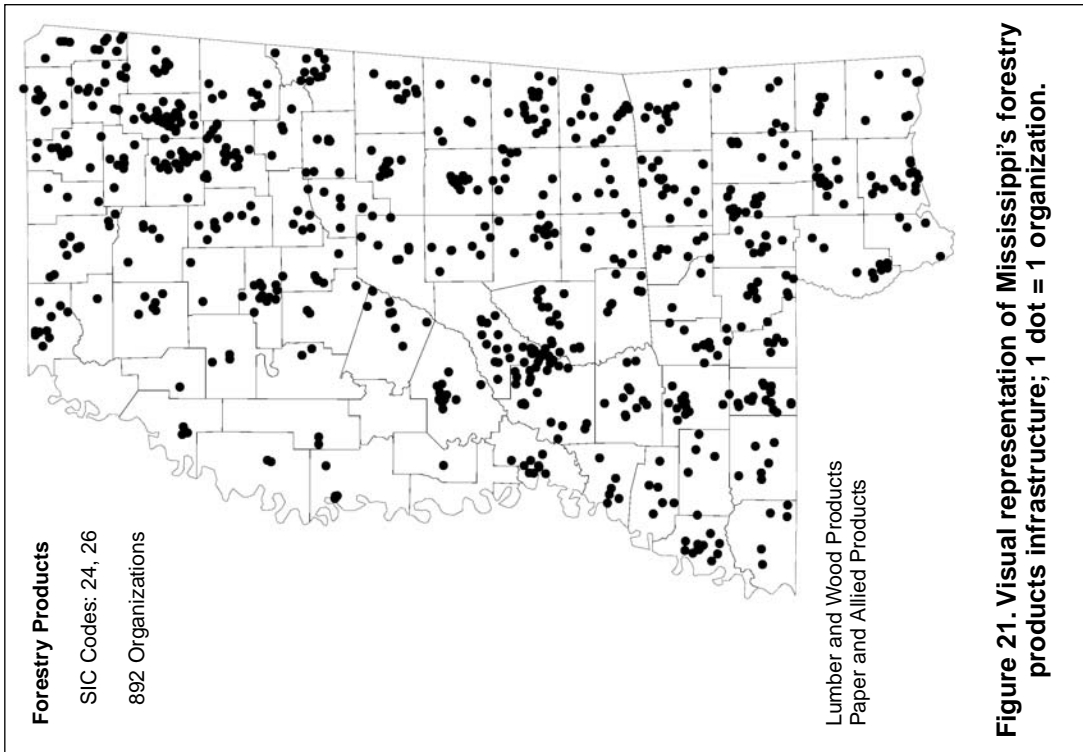
Figure 8. Number of organizations per annual sales range for Mississippi's farming, fishing, and agricultural services sector (442 organizations).

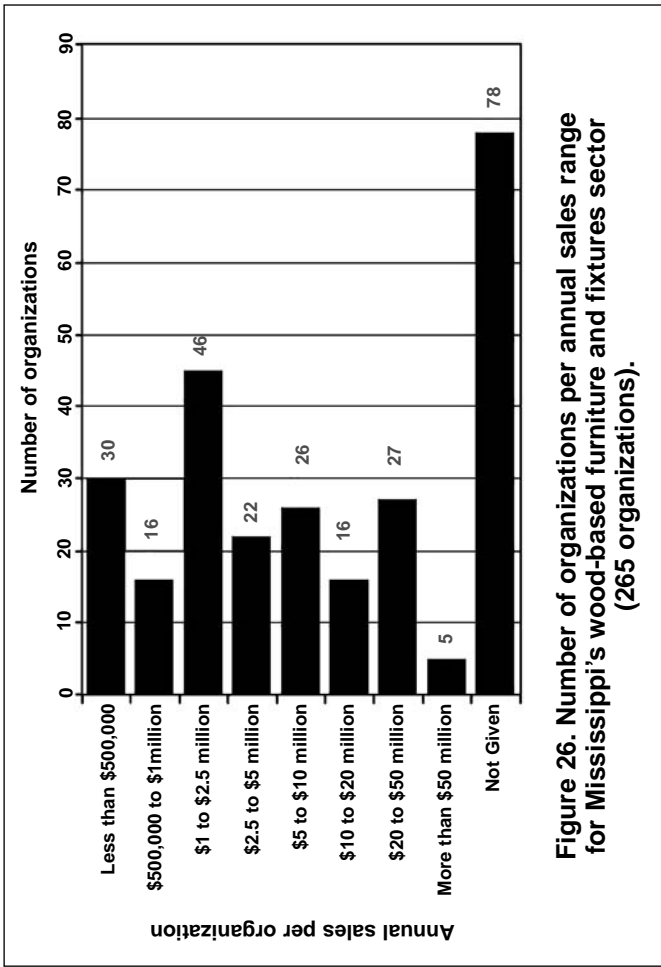
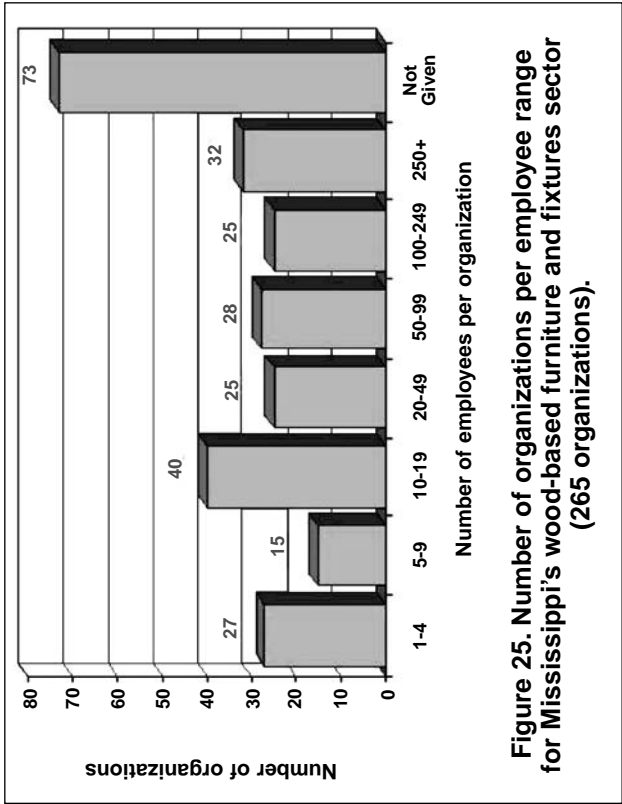
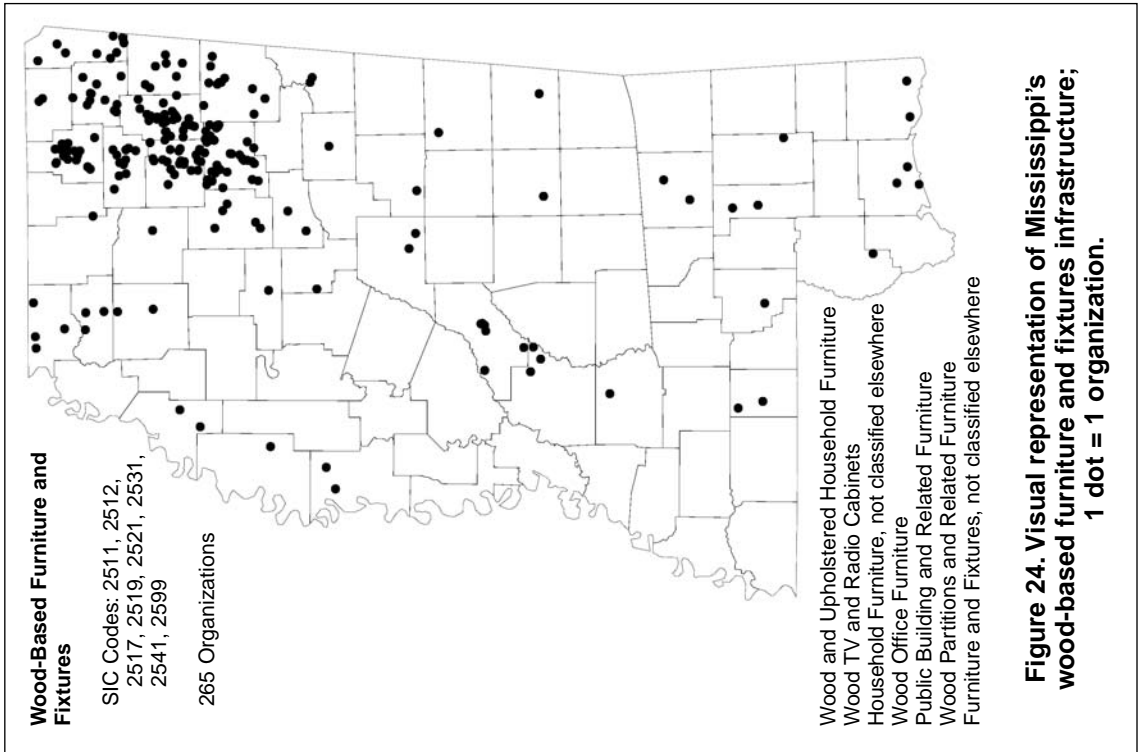












SUMMARY

The spatial data layers in this study include 12,944 agribusiness organizations that comprise the *1999 Mississippi Agribusiness Inventory*. The locations of these businesses are displayed geographically for visual analysis, and supporting graphs display employment and sales information about each agribusiness sector. The summary data below are based on the firms where employee numbers and/or sales data were known. County-level tables also provided more specific details about this diverse, statewide industry.

Number of Employees

Where numbers were reported, most of the firms were generally small. Agribusiness firms with less than 20 employees accounted for 81% of the 12,387 firms reporting. Overall, only 1% of the firms had more than 250 employees. Seventeen percent of the wood-based furniture and fixture industry had more than 250 employees. In this category, only 14% had less than five employees. Forty-five percent of the category had more than 50 employees. Three other agribusiness categories had more than 20% of the firms with 50 or more employees. These were the forestry products, natural fibers textiles, and agricultural processing sectors. Data on the number of employees were missing from 557 firms, or approximately 4%.

Annual Sales

Of 12,174 firms that reported annual sales data, a large majority (87%) of the businesses had annual sales of less than \$2.5 million. In the agricultural processing sector, 40% of the 239 firms reporting had more than \$10 million in sales. This was the only category in

which more than 10% of the firms had more than \$50 million in sales. In the farming, fertilizer, agricultural services, and aquacultural inputs categories, 92% of the firms in each sector had less than \$5 million in sales, and no firms had more than \$20 million in sales. Forestry and wood-based furniture categories had the widest distribution in sizes of firms. The wood-based furniture industry had at least 9% of the firms in each category, except for the more-than-\$50-million category, in which this sector had 3% (20 firms).

Eighty-six agribusiness firms in Mississippi reported more than \$50 million in sales. More than 500 agribusiness firms had more than \$10 million in sales, with 263 firms in the \$10-20 million category and 183 in the \$20-50 million category. Sales data were missing from 770 of the 12,944 firms in the database. This accounts for approximately 6% of the firms.

Conclusions

The agriculture industry is an important segment of Mississippi's economy. Cotton, soybeans, tractors, and cattle are commonly associated with Mississippi agriculture. However, there are many branches of agribusiness; while some of the entities are not as easily recognized, they are just as vital to Mississippi's growth and development.

Spatial technology applications are important business tools for examining the intricacies of business markets. The agribusiness market is no exception. Agribusiness trade analysis can greatly benefit from the use of spatial information. Where a business is located may be just as important as what it produces.

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