Hazus: Hurricane Global Risk Report

Region Name: Katrina_MS

Hurricane Scenario: 2005-KATRINA

Print Date: Sunday, August 11, 2024

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 82 county(ies) from the following state(s):

- Mississippi

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 47,545.51 square miles and contains 875 census tracts. There are over 1,158 thousand households in the region and a total population of 2,961,279.00 people. The distribution of population by State and County is provided in Appendix B.

There are an estimated 1,319 thousand buildings in the region with a total building replacement value (excluding contents) of 530,932 million dollars. Approximately 88% of the buildings (and 57% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,319,825.00 buildings in the region which have an aggregate total replacement valu million. Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix general distribution of the building value by State and County.

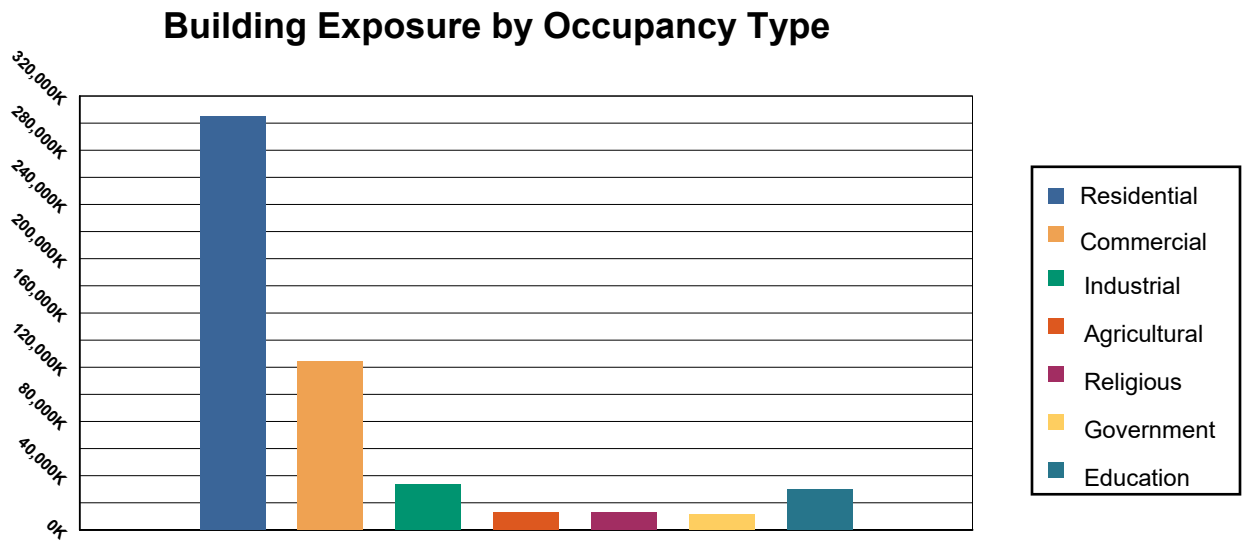


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	305,221,091	57.49%
Commercial	124,253,440	23.40%
Industrial	33,816,164	6.37%
Agricultural	12,992,386	2.45%
Religious	12,990,643	2.45%
Government	11,475,972	2.16%
Education	30,182,606	5.68%
Total	**530,932,302**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 130 hospitals in the region with a total bed capacity of 15,295 beds. There are 1,314 schools, 1,043 fire stations, 431 police stations and 84 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	2005-KATRINA
Type:	Historic
Max Peak Gust in Study Region:	127 mph

Building Damage

General Building Stock Damage

Hazus estimates that about 33,815 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the region. There are an estimated 3,395 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

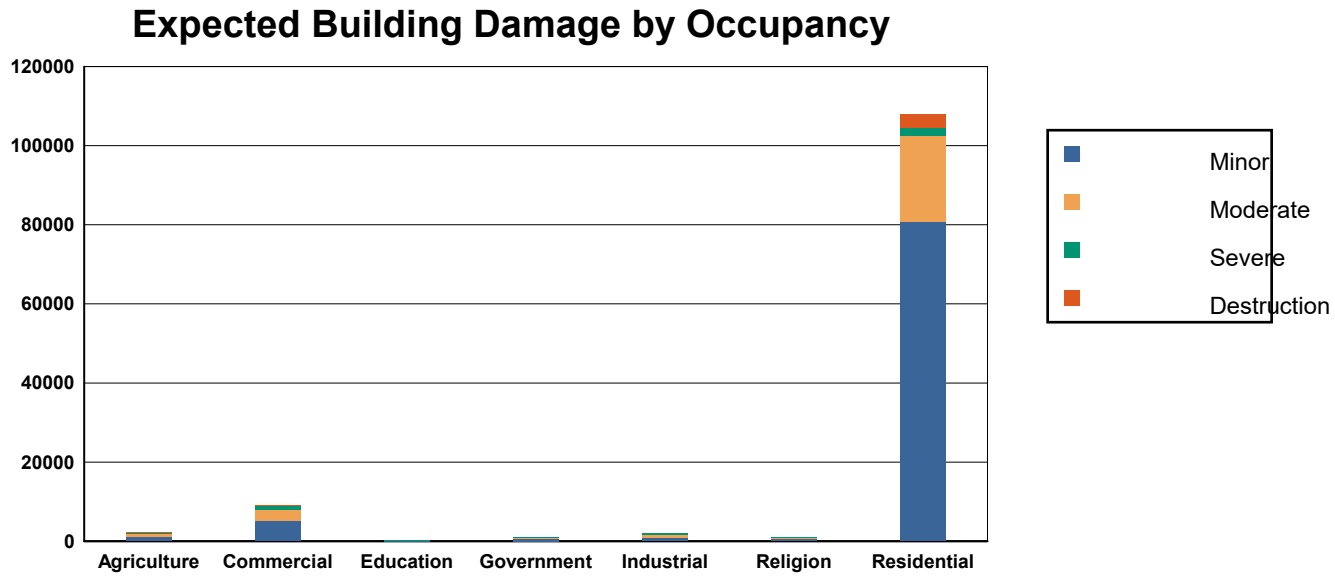


Table 2: Expected Building Damage by Occupancy

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	14,491	86.16	1,249	7.43	653	3.88	378	2.25	48	0.29
Commercial	91,862	91.14	5,243	5.20	2,862	2.84	789	0.78	34	0.03
Education	1,704	90.00	98	5.19	77	4.09	14	0.72	0	0.00
Government	7,852	88.12	578	6.48	368	4.14	112	1.26	0	0.00
Industrial	14,581	88.77	886	5.40	683	4.16	268	1.63	6	0.04
Religion	10,011	90.97	632	5.75	283	2.57	78	0.71	0	0.00
Residential	1,056,016	90.72	80,806	6.94	21,629	1.86	2,226	0.19	3,306	0.28
Total	**1,196,517**		**89,493**		**26,556**		**3,864**		**3,395**	

Table 3: Expected Building Damage by Building Type

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	17,651	91.11	1,029	5.31	540	2.79	153	0.79	0	0.00
Masonry	131,932	91.94	6,751	4.70	3,377	2.35	1,195	0.83	240	0.17
MH	128,771	96.82	2,201	1.66	1,278	0.96	90	0.07	661	0.50
Steel	46,058	87.06	2,724	5.15	3,313	6.26	802	1.52	9	0.02
Wood	876,222	90.26	73,926	7.62	16,663	1.72	1,657	0.17	2,305	0.24

Essential Facility Damage

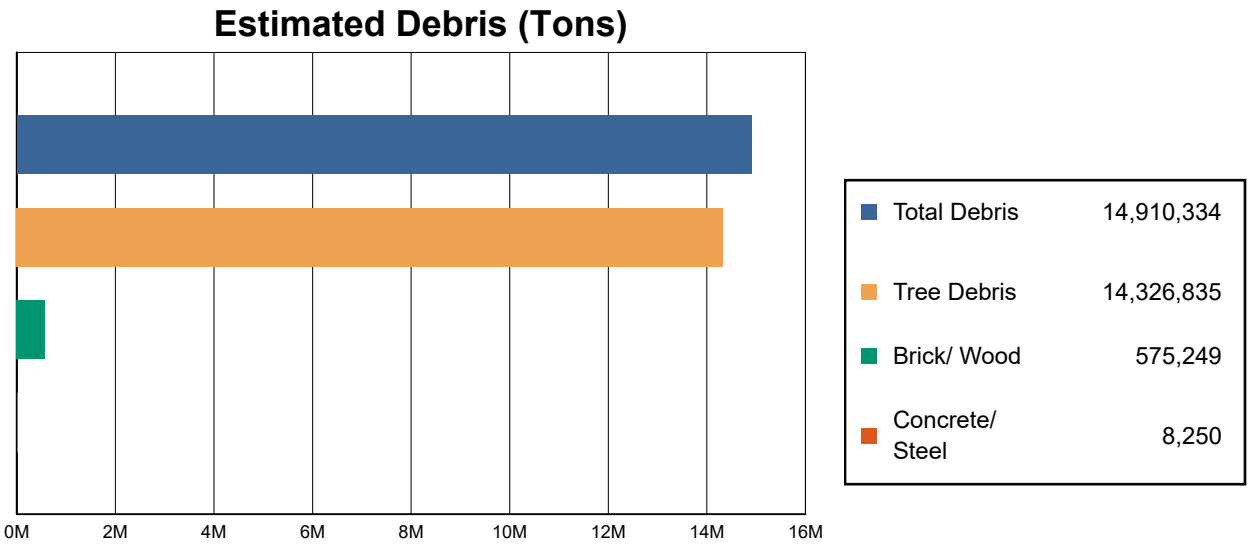
Before the hurricane, the region had 15,295 hospital beds available for use. On the day of the hurricane, the model estimates that 14,271 hospital beds (93%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, 100% of the beds will be in service. By 30 days, 100% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	84	0	0	84
Fire Stations	1,043	0	0	1,043
Hospitals	130	3	0	119
Police Stations	431	2	0	431
Schools	1,314	44	0	1,081

Induced Hurricane Damage

Debris Generation

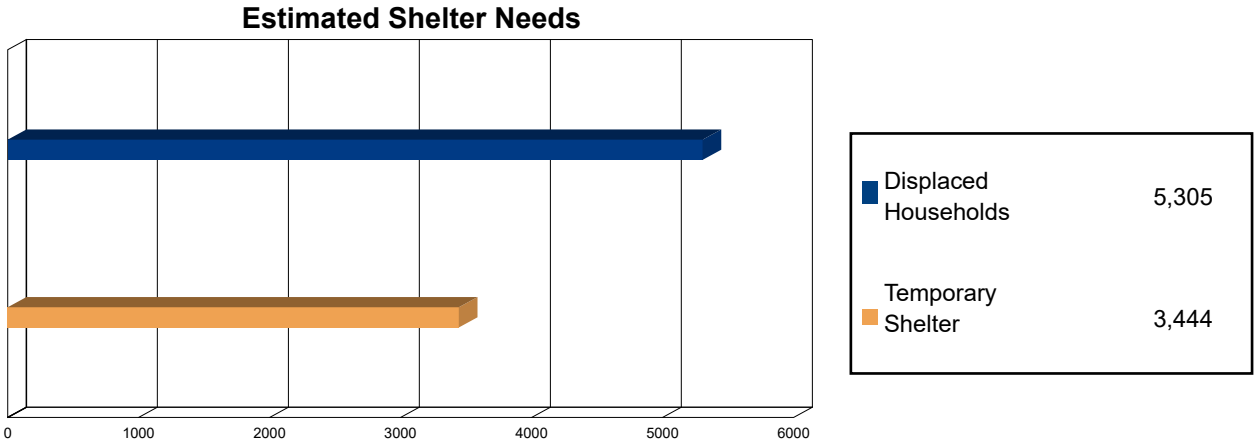


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 14,910,334 tons of debris will be generated. Of the total amount, 13,197,401 tons (89%) is Other Tree Debris. Of the remaining 1,712,933 tons, Brick/Wood comprises 34% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 23340 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,129,434 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5,305 households to be displaced due to the hurricane. Of these, 3,444 people (out of a total population of 2,961,279) will seek temporary shelter in public shelters.

Economic Loss

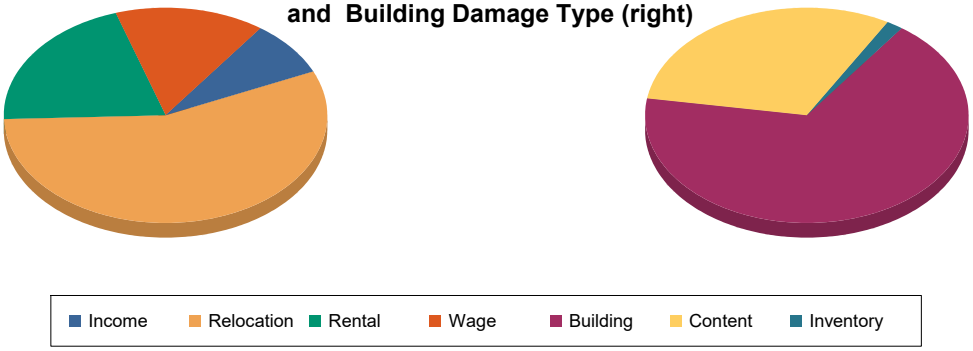
The total economic loss estimated for the hurricane is 9827.2 million dollars, which represents 1.85 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 9,827 million dollars. 12% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 73% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Loss by Business Interruption Type (left) and Building Damage Type (right)



Loss Type by General Occupancy

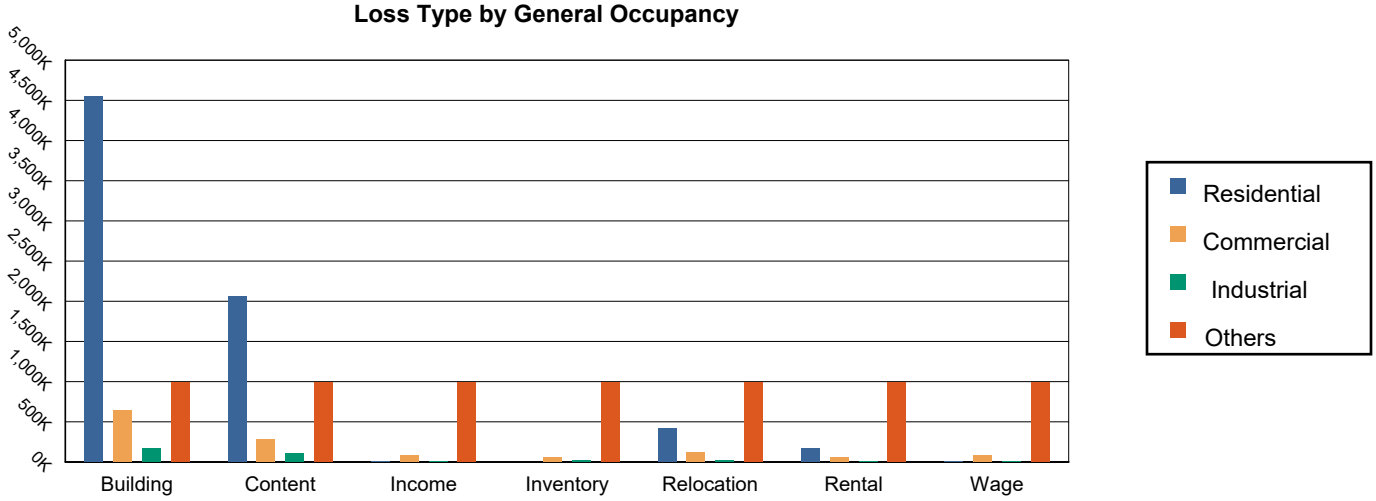


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	4,554,005.92	646,894.89	166,750.67	465,298.78	5,832,950.25
	Content	2,053,631.69	286,016.49	110,908.40	233,831.43	2,684,388.01
	Inventory	0.00	54,690.24	16,743.38	64,231.74	135,665.36
	Subtotal	**6,607,637.61**	**987,601.62**	**294,402.45**	**763,361.94**	**8,653,003.63**
Business Interruption Loss						
	Income	1,599.71	77,374.26	1,936.39	16,587.46	97,497.81
	Relocation	420,307.18	118,411.65	18,031.74	102,736.15	659,486.72
	Rental	165,350.52	62,034.81	2,315.56	11,471.09	241,171.98
	Wage	3,763.52	77,782.93	2,988.76	91,466.73	176,001.96
	Subtotal	**591,020.93**	**335,603.65**	**25,272.45**	**222,261.43**	**1,174,158.47**

Total

Total	**7,198,658.54**	**1,323,205.27**	**319,674.90**	**985,623.38**	**9,827,162.09**

Appendix A: County Listing for the Region

Mississippi
- Adams
- Alcorn
- Amite
- Attala
- Benton
- Bolivar
- Calhoun
- Carroll
- Chickasaw
- Choctaw
- Claiborne
- Clarke
- Clay
- Coahoma
- Copiah
- Covington
- DeSoto
- Forrest
- Franklin
- George
- Greene
- Grenada
- Hancock
- Harrison
- Hinds
- Holmes
- Humphreys
- Issaquena
- Itawamba
- Jackson
- Jasper
- Jefferson
- Jefferson Davis
- Jones
- Kemper
- Lafayette
- Lamar
- Lauderdale
- Lawrence
- Leake
- Lee
- Leflore
- Lincoln
- Lowndes
- Madison
- Marion

- Marshall
- Monroe
- Montgomery
- Neshoba
- Newton
- Noxubee
- Oktibbeha
- Panola
- Pearl River
- Perry
- Pike
- Pontotoc
- Prentiss
- Quitman
- Rankin
- Scott
- Sharkey
- Simpson
- Smith
- Stone
- Sunflower
- Tallahatchie
- Tate
- Tippah
- Tishomingo
- Tunica
- Union
- Walthall
- Warren
- Washington
- Wayne
- Webster
- Wilkinson
- Winston
- Yalobusha
- Yazoo

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Mississippi				
Adams	29,538	2,849,178	2,116,809	4,965,987
Alcorn	34,740	3,636,207	2,518,743	6,154,950
Amite	12,720	2,071,643	688,612	2,760,255
Attala	17,889	1,854,768	1,211,330	3,066,098
Benton	7,646	783,899	469,784	1,253,683
Bolivar	30,985	3,793,697	4,471,006	8,264,703
Calhoun	13,266	1,201,513	1,129,932	2,331,445
Carroll	9,998	1,185,608	453,978	1,639,586
Chickasaw	17,106	1,391,815	2,181,141	3,572,956
Choctaw	8,246	768,763	504,396	1,273,159
Claiborne	9,135	798,376	1,201,139	1,999,515
Clarke	15,615	1,408,326	1,154,741	2,563,067
Clay	18,636	1,625,569	1,681,971	3,307,540
Coahoma	21,390	1,802,257	2,090,288	3,892,545
Copiah	28,368	3,023,846	2,132,074	5,155,920
Covington	18,340	1,776,677	868,710	2,645,387
DeSoto	185,314	19,034,448	11,524,227	30,558,675
Forrest	78,158	6,325,571	7,100,720	13,426,291
Franklin	7,675	778,759	652,258	1,431,017
George	24,350	2,337,328	1,265,974	3,603,302
Greene	13,530	1,735,778	473,332	2,209,110
Grenada	21,629	2,184,211	1,697,717	3,881,928
Hancock	46,053	6,160,425	2,221,236	8,381,661
Harrison	208,621	23,388,801	13,939,731	37,328,532

Hinds	227,742	21,588,749	17,730,219	39,318,968
Holmes	17,000	1,312,781	1,202,045	2,514,826
Humphreys	7,785	694,463	716,270	1,410,733
Issaquena	1,338	512,649	203,019	715,668
Itawamba	23,863	1,758,023	1,225,883	2,983,906
Jackson	143,252	14,943,377	8,125,921	23,069,298
Jasper	16,367	1,744,798	1,291,193	3,035,991
Jefferson	7,260	910,888	297,684	1,208,572
Jefferson Davis	11,321	1,142,967	791,593	1,934,560
Jones	67,246	5,435,586	8,879,632	14,315,218
Kemper	8,988	684,523	558,093	1,242,616
Lafayette	55,813	5,895,935	4,346,225	10,242,160
Lamar	64,222	7,268,516	3,924,326	11,192,842
Lauderdale	72,984	9,110,124	7,632,662	16,742,786
Lawrence	12,016	1,179,659	1,229,928	2,409,587
Leake	21,275	2,601,255	1,067,707	3,668,962
Lee	83,343	7,424,633	9,559,867	16,984,500
Leflore	28,339	2,648,673	3,034,715	5,683,388
Lincoln	34,907	3,159,996	2,308,965	5,468,961
Lowndes	58,879	6,182,236	5,607,418	11,789,654
Madison	109,145	15,518,790	6,787,316	22,306,106
Marion	24,441	2,598,250	2,807,414	5,405,664
Marshall	33,752	4,242,228	3,461,793	7,704,021
Monroe	34,180	2,637,979	3,247,518	5,885,497
Montgomery	9,822	895,648	691,969	1,587,617
Neshoba	29,087	3,135,503	3,145,075	6,280,578
Newton	21,291	2,179,836	1,294,095	3,473,931

Noxubee	10,285	872,059	886,623	1,758,682
Oktibbeha	51,788	4,870,712	4,058,984	8,929,696
Panola	33,208	2,398,416	2,296,556	4,694,972
Pearl River	56,145	6,177,049	2,625,984	8,803,033
Perry	11,511	1,218,142	988,904	2,207,046
Pike	40,324	5,342,674	1,865,345	7,208,019
Pontotoc	31,184	2,899,197	2,274,390	5,173,587
Prentiss	25,008	2,862,473	1,550,943	4,413,416
Quitman	6,176	561,699	413,203	974,902
Rankin	157,031	15,756,618	8,802,178	24,558,796
Scott	27,990	2,292,707	2,609,171	4,901,878
Sharkey	3,800	413,050	356,674	769,724
Simpson	25,949	3,492,053	1,058,226	4,550,279
Smith	14,209	2,117,469	1,721,057	3,838,526
Stone	18,333	1,657,454	1,308,482	2,965,936
Sunflower	25,971	2,097,140	2,367,500	4,464,640
Tallahatchie	12,715	1,084,862	570,206	1,655,068
Tate	28,064	2,372,933	1,480,061	3,852,994
Tippah	21,815	1,785,974	1,617,050	3,403,024
Tishomingo	18,850	1,905,120	1,326,371	3,231,491
Tunica	9,782	817,900	1,261,272	2,079,172
Union	27,777	2,632,703	2,017,055	4,649,758
Walthall	13,884	1,454,903	1,305,548	2,760,451
Warren	44,722	5,411,908	4,382,934	9,794,842
Washington	44,922	4,720,680	5,321,390	10,042,070
Wayne	19,779	1,757,025	1,431,651	3,188,676
Webster	9,926	1,020,034	671,830	1,691,864

Wilkinson	8,587	1,080,033	549,134	1,629,167
Winston	17,714	1,374,884	1,464,960	2,839,844
Yalobusha	12,481	1,212,384	583,676	1,796,060
Yazoo	26,743	2,235,308	1,625,459	3,860,767
Total	**2,961,279**	**305,221,091**	**225,711,211**	**530,932,302**
Study Region Total	**2,961,279**	**305,221,091**	**225,711,211**	**530,932,302**