



Coastal Marine Institute

OCS-Related Infrastructure Fact Book

Volume II: Communities in the Gulf of Mexico



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Authors

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1. INTRODUCTION

The backbone of offshore oil and gas activities is the infrastructure in coastal areas that support a wide range of activities in the offshore Gulf of Mexico (GOM). Bureau of Ocean Energy Management (BOEM) sponsored a comprehensive compilation of all types of infrastructure supporting offshore activities, including:

- Platform fabrication yards
- Shipyards
- Ports
- Terminals
- Repair and maintenance facilities
- Supply bases
- Pipe coating yards
- Waste management facilities
- Petrochemical plants
- Refineries
- Natural gas storage
- Natural gas processing
- Heliports
- Helipads

The compendium is known as the “Infrastructure Fact Book” (Louis Berger Group, 2004). Louisiana State University’s Center for Energy Studies made its infrastructure database available to ERG for this study.

In 2005, Hurricanes Katrina and Rita roared through the Gulf of Mexico leaving death and destruction in their wakes. For a post-hurricane socioeconomic analysis of OCS-related infrastructure and community, ERG

- developed a weighting scheme for identifying counties with heavy concentrations of infrastructure (Chapter 2);
- used GIS techniques to develop maps of wind and storm surge data from Hurricanes Katrina and Rita (Chapter 3);
- overlaid the storm damage with areas of high infrastructure concentration (Chapter 3);
- selected six counties with high infrastructure concentration and storm damage (Chapter 3); and
- prepared community profiles for the six counties, including the role of OCS-related activities in recovering from the storms (Chapters 4 through 9).

2. INFRASTRUCTURE CONCENTRATION

2.1. Initial Data Set

BOEM and LSU provided ERG with shapefiles and databases for 14 types of OCS-related infrastructure in May 2006.¹ The data set contained 1,528 observations with facilities occurring in 85 counties² with a median count of 5 facilities per county. Table 1 summarizes the count of facilities by type of infrastructure. Heliports and terminals, both relatively small operations in terms of the number of employees and revenues, account for nearly 60 percent of the facilities. Thus, it is possible for a county to be considered as having a high concentration of infrastructure while having a relatively small number of associated jobs and revenues.

Table 1

Count of OCS-Related Facilities by Infrastructure Type

Infrastructure Type	Count	Percent
Helipad	33	2%
Heliport	247	16%
Natural Gas Processing	82	5%
Natural Gas Storage	20	1%
Petrochemical Manufacturing	71	5%
Pipe Coating	16	1%
Platform Fabrication	43	3%
Port Terminal	29	2%
Refinery	38	2%
Repair and Maintenance	87	6%
Shipyards	105	7%
Supply Base	92	6%
Terminal	631	41%
Waste Management	34	2%
Total	1,528	100%

¹ Helipads, heliports, natural gas processing, natural gas storage, petrochemical facilities, pipe coating yards, platform fabrication yards, port terminals, refineries, repair & maintenance facilities, shipyards, supply bases, terminals, and waste management facilities.

² Twelve counties outside of the BOEM economic areas also have facilities. These facilities are included in the 1,528 observations.

2.2. Parameters of Interest

OCS-related infrastructure could potentially affect the surrounding community in three ways:

- It could provide jobs.
- It could release pollutants to the surrounding environment.
- It could affect the surrounding community.

The first parameter is measured by employment at the facility. The second is measured by the chemical releases reported to the U.S. Environmental Protection Agency's Toxic Release Inventory (USEPA, 2006a and 2006b). ERG estimated the third parameter by calculating the population within a 1-mile or 5-mile radius of the facility center as provided by the longitude/latitude data in the LSU Infrastructure database overlaid with block data from the 2000 Census (USDOC, Census, 2006a). Community impacts may include, but are not limited to, decreased property values, increased traffic congestion, increased costs of road maintenance due to heavy-weight vehicular traffic, noise and light pollution, increased erosion from pipelaying activities, waterway dredging to accommodate the vessels supporting OCS operations, changes in habitat due to roads in isolated areas to service OCS-related infrastructures, such as natural gas processing stations, increase in human morbidity and mortality due to industrial accidents, and loss in opportunity value of water used in related industrial processes, such as refining.

2.3. Options for Measurement

ERG identified five options for measurement:

- **Baseline:** Each facility has a weight of one.
- **Simple:** Each infrastructure category as classified as “small, medium, or large” with corresponding weights of one, two, or three.
- **Category by Rank:** In this option, the weight assigned to a facility depends on the infrastructure category to which it belongs. The categories are sorted in terms of increasing average values and ranks are assigned to a category or groups of categories. (The number of ranks varies by parameter.)
- **Category by Parameter:** This option differs from the “Category by Rank” option in that the weight assigned to a category bears a relationship to the average value for the parameter.
- **Facility by Parameter:** Each facility in the database is assigned a weight scaled to the parameter value for that facility.

The following subsections describe the detailed measurement analyses for each parameter.

2.3.1. Baseline

The simplest option is to count the facilities in the area of interest (e.g., county, Census block, or labor market area). The drawback of this option is that a region with 10 heliports is considered to have a higher concentration of infrastructure than a region with a petrochemical manufacturing facility. However, the option provides a baseline against which to measure the other options.

2.3.2. Simple

Based on discussions with LSU and BOEM, ERG divided the infrastructure categories into three groups. Petrochemical manufacturing and refinery facilities are assigned a weight of three. Platform fabrication, repair and maintenance, and shipyard facilities are assigned a weight of two. All other facilities are assigned a weight of one.

2.3.3. Category by Rank

2.3.3.1. Employees

Two of the data sets provided by BOEM/LSU—petrochemical manufacturing plants and refineries—contain employment data as of 2002. These data indicate:

- Petrochemical manufacturing facilities have an average of 349 and a median of 200 employees.
- Refinery facilities have an average of 674 and a median of 455 employees.

The difference between the median and average values indicates a skewed distribution with one or more large observations.

For the remaining infrastructure categories, ERG used County Business Patterns data for 2003, the most recent year for which data are available (USDOC, Census, 2003). Table 2 identifies the most likely NAICS codes for each category. Note that there is no apparent specific NAICS code for pipe coating facilities, helipads, supply bases or terminals. For each state in the area of interest, we collected County Business Pattern data on the number of facilities and the number of employees. For reasons of confidentiality, Census sometimes publishes a range for employment. Where this occurs, we noted in Table 3 whether we used the upper or lower end of the range.

Heliports in Louisiana average about 50 employees. Heliports in other states are about half that size. Natural gas processing and natural gas storage facilities typically have an average of 20 or fewer employees. Pipe coating, port terminal, and waste management facilities are slightly larger with averages of 35 employees or fewer.

Offshore platform fabrication, repair and maintenance, and shipyard facilities all fall within NAICS 336611. This heterogeneity of operations is evident in the range of the average number of employees. The low is in Louisiana (28 employees) while Mississippi has the highest (833 employees). The latter is skewed by the 10,000+ employees at the Ingalls shipyard.

Table 2**Infrastructure Types and NAICS Codes**

Infrastructure Type	NAICS	Description/Comment
Helipad		See text
Heliport	481211	Helicopter passenger carriers (except scenic, sightseeing), nonscheduled
	481212	Helicopter carriers, freight, nonscheduled
Natural Gas Processing		Appears to be part of natural gas production NAICS 211111.
Natural Gas Storage	48621	Pipeline transportation of natural gas, including storage
Petrochemical Manufacturing	32511	Petrochemical Manufacturing.
Pipe Coating	332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
	237120	Oil and Gas Pipeline and Related Structures Construction. This industry includes corrosion protection for underground pipelines and oil storage tanks but also comprises establishments primarily engaged in the construction of oil and gas lines, mains, refineries, and storage tanks.
Platform Fabrication	336611	Shipbuilding and repairing, including oil and gas offshore drilling and production platforms
Port Terminal	488310	Port and harbor operations
Refinery	32411	Refinery
Repair and Maintenance	336611	Shipbuilding and repairing
Shipyard	336611	Shipbuilding and repairing
Supply Base		See text
Terminal		See text
Waste Management	562210	Waste Treatment and Disposal

Source: <http://www.census.gov/epcd/naics/NAICS48.HTM#N481>
<http://www.census.gov/epcd/naics02/def/ND237120.HTM#N237120>

Table 3

Average Number of Employees by NAICS and State

Infrastructure Type	NAICS	Alabama			Florida			Louisiana			Mississippi			Texas		
		Estabs.	Emps.	Avg.	Estabs.	Emps.	Avg.	Estabs.	Emps.	Avg.	Estabs.	Emps.	Avg.	Estabs.	Emps.	Avg.
Heliport	481211	16	249*	16	150	2,721	18	29	1,479	51	20	99*	5	111	783	7
	481212	NA	NA	NA	37	874	24	5	249*	50	1	20**	20	37	524	14
Natural Gas Processing	211111	35	511	15	26	99*	4	54	999*	19	77	391	5	2,749	28,371	10
Natural Gas Storage	48621	32	427	13	28	499*	18	156	1,504	10	67	587	9	460	8,595	19
Platform Fabrication Repair and Maintenance Shipyard	336611	25	2228	89	69	2524	37	9	249*	28	12	10,000**	833	63	3,439	55
Port Terminal	488310	3	19*	6	26	592	23	13	363	28	1	19	19	16	499*	31
Waste Management	56221	55	1,368	25	104	1626	16	47	1,359	29	40	288	7	187	3,951	21

Source: USDOC, Census, 2003.

* Upper bound used in calculation.

** Lower bound used in calculation.

The remaining sectors are pipe coating facilities, helipads, supply bases, and terminals. ERG examined the Census data for NAICS 237120 and 332812 for **pipe coating** operations in Alabama, Florida, Louisiana, Mississippi, and Texas and found between 400 to 600 facilities. The BOEM data file lists only 16 facilities; using Census data would therefore include an overwhelming proportion of non-OCS-related facilities. For this infrastructure type, ERG searched the InfoUSA database and located employment data for 12 of the 16 facilities (InfoUSA, 2006). The average number of employees is 61 while the median is 13, indicating a skewed distribution.

Louis Berger Group (2004) does not mention **helipads** as a separate type of infrastructure. Helipads are only mentioned within the section on heliports but without any further distinction between the two types of facilities. In general, helipads are smaller operations and can be located away from small and medium sized airports. That is, helipads might be included in the Table 3 Census data for heliports. In any case, if heliports are small, helipads are smaller.

ERG examined OMB (1998) and did not find a single NAICS code that described **supply bases**. ERG examined the supply base database provided by BOEM/LSU and noted that the company titles mentioned services ranging from marine supply/services, fuel and lubricant, offshore leasing, oilfield services, dispatching, and seismic services.

ERG searched a commercial business database (InfoUSA at www.infousa.com) for a company with 14 supply base facilities (ASCO Fuel & Lubricant). The search was done on the company name and limited to facilities in Louisiana and Texas. The InfoUSA listed 15 facilities with definite matches on 10 facilities. The fifteen facilities were represented by nine different primary NAICS codes. Where employment data were available, the facilities had fewer than 20 employees.

ERG then searched for Tesoro Marine Services, the owner listed for 15 supply base facilities in the BOEM/LSU database. Tesoro Petroleum Corporation sold its marine services assets to Martin Midstream Partners LP and Midstream Fuel Services LLC at the end of December 2003 (Aldridge, 2003). A search on Martin Midstream facilities in TX and LA resulted in 16 facilities, 9 of which had street addresses that matched the BOEM/LSU database. The pattern of a wide range in NAICS codes and fewer than 20 employees was seen for this group as well.

ERG proposes to use a typical employment estimate of 20 employees for a supply base facility. This estimate might be somewhat high but not cause substantial distortion in a weighting scheme.

ERG examined OMB (1998) and did not find a single NAICS code that described terminals. NAICS 488999 includes independently operated pipeline terminal facilities but it also includes car pools, van pools, and stockyard transportation. The Louis Berger Group (2004) discusses terminals under port facilities and describes them as inland or river terminals. ERG examined the corrected terminals database. The majority of terminals have owner or operator names associated with petroleum companies, petrochemical companies, or oil field services companies. Terminals are small operations within these larger companies and might be operating as cost centers under the company's NAICS code for the company's primary operations. Spot checks in

the InfoUSA database for four company names (ACE Marine, Aker Gulf, Baroid Company, and Eastlake) in Texas and Louisiana did not find any matching facilities. To estimate the number of employees that might work at a “typical” terminal, ERG examined the financial information for Valero, L.P. The 2005 Form 10-K mentioned that it had no employees but that Valero GP, LLC had 1,291 employees as of January 1, 2006 (Valero, 2006a). Valero owns a refinery in Houston with 300 employees (Valero, 2006b). The Valero L.P. website mentions that it has 89 terminals (Valero, 2006c). By subtracting the number of employees at the Houston refinery, there are, at most, 991 employees at the 89 terminals or about 11 to 12 employees per terminal. This is likely to be an overestimate because some of the non-refinery employees would be working in the corporate offices. However, the information is sufficient to propose that a typical terminal would have fewer than 20 employees.

In sum, refineries have an average of more than 500 employees per facility and are assigned a weight of five. Petrochemical manufacturing, platform fabrication, repair and maintenance, and shipyard facilities have an average number of employees between 100 to 500 employees and are assigned a weight of four. Pipe coating facilities, with an average number of employees between 50 and 100, are assigned a weight of three. With the exception of helipads and terminals, other facilities have an average of fewer than 50 employees per facility and are assigned a weight of two. Helipads and terminals are somewhat smaller facilities (at least a helipad is typically smaller than a heliport) and are assigned a weight of 1.

For this parameter, the weights range in value from one to five. The range in facility employment by infrastructure type spans nearly three orders of magnitude and, although there are data gaps, the relative ranking by infrastructure type can be considered reasonably accurate. For example, the likelihood of badly misclassifying a facility by more than one of five “size bins” is relatively small. The tradeoff is a limited ability to make finer distinctions in the relative importance due, in part, to the inclusion of a useful qualitative measure. ERG presents the methods used to generate the data in detail to facilitate the transparency and reproducibility of the analysis as well as to permit the reader to make his or her own determination of the accuracy of the estimates.

2.3.3.2. Pollutant Releases

In 1986, the Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted with the primary purpose to inform communities and citizens of chemical hazards in their area. The law required facilities in certain industries, which manufacture, process, or use significant amounts of toxic chemicals, to report annually on their releases of these chemicals. The reports contain information about the types and amounts of toxic chemicals that are released each year to the air, water, and land as well as information on the quantities of toxic chemicals sent to other facilities for further waste management (USEPA, 2006d). The U.S. Environmental Protection Agency maintains this information in a database called the Toxics Release Inventory (TRI), which is available to the public over the Internet through several data access tools, including the TRI Explorer and Envirofacts. The TRI program has expanded significantly since its inception in 1987 by roughly doubling the number of chemicals included in the TRI to approximately 650, adding seven new industry sectors, and by reducing the reporting thresholds for certain persistent, bioaccumulative, and toxic (PBT) chemicals (USEPA, 2006e).

A plant, factory, or other facility is required to report releases if it meets all three of the following criteria; 1) It is included in a covered SIC code, 2) It has 10 or more full-time employees, and 3) It manufactures, processes, or otherwise uses any of the listed chemicals in amounts greater than the “threshold” quantities. If a facility is not required to report, it is considered to have insignificant toxic releases. The helipad, heliport, natural gas processing, natural gas storage, port terminal, and waste management categories are considered to have insignificant releases. *The Emergency Planning and Community Right-to-Know Act: Section 313 Release and Other Waste Management Reporting Requirements* contains a list of the included SIC codes and chemicals (USEPA, OEI, 2001).

For this approach, we use the average of the parameter for the category. The dataset from TRI Explorer contains reported releases for petrochemical manufacturing, pipe coating, platform fabrication, repair and maintenance, shipyards, supply bases, and terminals. These data indicate:

- Petrochemical manufacturing facilities have an average of 936,254 lbs. of releases and a median of 92,252 lbs.
- Refineries have an average of 805,706 lbs. of releases and a median of 361,521 lbs.
- Pipe coating facilities have an average of 85,907 lbs. of releases and a median of 29,362 lbs.
- Platform fabrication, repair and maintenance, and shipyard facilities have an average of 55,954 lbs. of releases and a median of 11,311 lbs.
- Supply bases and terminals have an average of 7,078 lbs. of releases and a median of 1,836 lbs.











The difference between the median and average values indicates a skewed distribution with one or more large observations.

For the remaining infrastructure categories, the operations are not a covered Standard Industrial Classification (SIC) code and are not required to report. Table 4 identifies the most likely NAICS codes and their corresponding SIC codes for each category. Note that there is not a specific NAICS code for each category or a specific SIC code for each NAICS code. For each state and county in the area of interest, we collected TRI data on the number of facilities and the pounds of releases.




Data were only collected on facilities in a BOEM county that reported a SIC code corresponding to an OCS industry. A summary of the data collected is reported in Table 5. The SIC codes found for heliports, natural gas processing, natural gas storage, port terminals, and waste management are not covered SIC codes in the TRI database. Consequently, it is assumed that the toxic releases in these industries are negligible.

Table 4

Infrastructure Types, NAICS Codes, and SIC Codes

Infrastructure Type	NAICS	Description/Comment		SIC	Bridge*	SIC Description
Helipad		See text				
Heliport	481211	Helicopter passenger carriers , nonscheduled	57% of	4522		Nonscheduled charter passenger air transport
	481212	Helicopter carriers, freight, nonscheduled	16% of	4522		Nonscheduled charter freight air transport
Natural Gas Processing		Appears to be part of natural gas production NAICS 211111.		1311		Crude petroleum and natural gas
Natural Gas Storage	48621	Pipeline transportation of natural gas, including storage		4922		Pipeline transportation of natural gas
			0% of	4923		Natural gas transmission and dist.
Petrochemical Manufacturing	32511	Petrochemical Manufacturing.	28% of	2865		Cyclic crudes and intermediates
				2869		Industrial organic chemicals, n.e.c.
Pipe Coating	332812	Metal Coating, Engraving	100% of	3479		Metal coating and allied services
	237120	Oil and Gas Pipeline and Related Structures Construction				
Platform Fabrication	336611	Shipbuilding and repairing, including oil and gas offshore drilling and production platforms		3731		Ship building and repairing
Port Terminal	488310	Port and harbor operations	17% of	4491		Operation of a port or waterfront terminal
Refinery	32411	Refinery		2911		Petroleum refining
Repair and Maintenance	336611	Shipbuilding and repairing		3731		Ship building and repairing
Shipyards	336611	Shipbuilding and repairing		3731		Ship building and repairing
Supply Base		See text		5171		Petroleum Bulk Stations and Terminals
Terminal		See text		5171		Petroleum Bulk Stations and Terminals
Waste Management	562210	Waste Treatment and Disposal		9511		Air and Water Resource and Solid Waste Management

*Bridge symbols shown indicate the comparability of SIC and NAICS categories.

-  (Bridge complete.) Comparable SIC derivable from NAICS data.
-  (Drawbridge slightly open.) Almost comparable Sales or receipts from NAICS are within 3% of SIC sales or receipts.
-  (Drawbridge open.) Not comparable SIC sales or receipts cannot be estimated within 3% from NAICS data.

Source: <http://www.census.gov/epcd/ec97brdg/>

Table 5

Average Pounds of Releases by SIC and State

		Infrastructure Type							
		Petrochemi- cal Man.	Refinery	Pipe Coating	Platform Fab.	Repair and Maint.	Shipyard	Supply Base	Terminal
		2865 2869	2911	3479	3731		5171		
AL	Reporting Facilities	12	2	9	1		6		
	Releases (lbs)	1,313,289	42,127	567,023	113,599		25,977		
	Avg.	109,441	21,064	63,003	113,599		4,330		
FL	Reporting Facilities	9	0	4	3		19		
	Releases (lbs)	25,133,492	0	101,894	171,918		127,629		
	Avg.	2,792,610	0	25,474	57,306		6,717		
LA	Reporting Facilities	54	18	5	13		14		
	Releases (lbs)	50,022,105	562,788	562,788	790,288		18,217		
	Avg.	926,335	31,266	112,558	60,791		1,301		
MS	Reporting Facilities	4	1	4	2		2		
	Releases (lbs)	55,232	5,601	872,954	376,622		29		
	Avg.	13,808	5,601	218,239	188,311		15		
TX	Reporting Facilities	128	26	24	9		33		
	Releases (lbs)	117,282,835	27,244,796	1,847,083	114,297		351,903		
	Avg.	916,272	1,047,877	76,962	12,700		10,664		

Source: USEPA, 2006b.

Neither a NAICS nor a SIC code was found to correspond to helipads. Helipads are only mentioned by BOEM within the section on heliports but without any further distinction between the two types of facilities. Since the SIC codes found for heliports are not covered SIC codes in the TRI database, and since helipads are smaller operations, it is unlikely that helipads would be required to report TRI releases.

Two SIC codes were found to correspond to petrochemical manufacturing. Data on any facility in a BOEM county that reported either of these two SIC codes were collected. These data are grouped together for obtaining estimates of releases in the petrochemical manufacturing industry.

A NAICS code was not found to describe supply bases or terminals. ERG searched for the company titles in the supply base and terminals databases provided by BOEM/LSU in the TRI database and found several matches. Every match found in the TRI database reported the same SIC code, 5171. Data on all facilities in a BOEM county that reported this SIC code were then collected.

Table 6 summarizes the releases reported to TRI by infrastructure type.

Table 6

TRI Releases in Petrochemical Manufacturing, Refinery, Pipe Coating, Platform Fabrication, Repair and Maintenance, and Shipyards

Parameter	Petrochemical Manufacturing	Refinery	Pipe Coating	Platform Fabrication	Repair and Maintenance	Shipyards	Supply Base	Terminal
Minimum	0	22	30	10			0	
1st Quartile	16,917	57,325	12,331	2,468			17	
Median	92,252	361,521	29,326	11,311			1,836	
3rd Quartile	480,811	896,944	98,948	67,592			8,707	
Maximum	24,876,440	10,250,768	798,166	373,936			131,355	
Average	936,265	805,706	85,907	55,954			7,078	

Source: USEPA, 2006b.

In sum, petrochemical manufacturing facilities have the highest average of releases per facility at over 900,000 lbs. and are assigned a weight of six. Refineries average approximately 800,000 lbs. of releases per facility and are assigned a weight of five. Pipe coating facilities have the next highest at approximately 85,000 lbs. of releases per facility and are assigned a weight of four. At approximately 50,000 lbs. of releases, platform fabrication, repair and maintenance, and shipyards are assigned a weight of three. Having the lowest average TRI releases at approximately 7,000 lbs., supply bases and terminals are assigned a weight of two. All other facilities are not required to report TRI releases and are assigned a weight of one.

As with employment, the classification of infrastructure type by pollutant releases into one of six “size bins” is facilitated by the two to three order of magnitude range in releases. The same tradeoff between classification accuracy and precision occurs because of the use of aggregated measures (i.e., average releases).

2.3.3.3. Population

For estimating population, ERG used Summary File 1 (SF-1) block group data from the 2000 U. S. Census. (USDOC, Census, 2006a). The Census Bureau provides shapefiles showing the location and boundaries of each level of census geography. Because we are interested in small areas near facilities, we chose to use the “block group” level. Block groups are components of census tracts that generally contain 600 to 3,000 people. We joined block group SF-1 data to the shapefile based on the block group identification number and generated a new shapefile that now included the spatially referenced population data.

After ensuring that all files used the same projection, Albers Equal Area, we used ArcMap’s buffer tool to generate a one-mile or five-mile buffer area around each facility and joined the facility data to the new buffer shapefile. We then intersected the buffer shapefile with the block

group shapefile. Like a cookie cutter, this operation divided block group areas into portions that fit inside the radius around each facility. If we assume that the population of a block group is evenly dispersed over its area, then the proportion of the block group's area that is within the one-mile radius is equal to the proportion of population within one-mile of the facility. Figure 1 illustrates the idea. With this assumption, we could sum the population of all block groups wholly within the one-mile radius, as in Block Group 1 in the figure, along with the proportionate share of the population of block groups partially within the radius to arrive at a total population near the facility, as in Block Group 2. These totals were aggregated by facility and saved as a separate facility database.

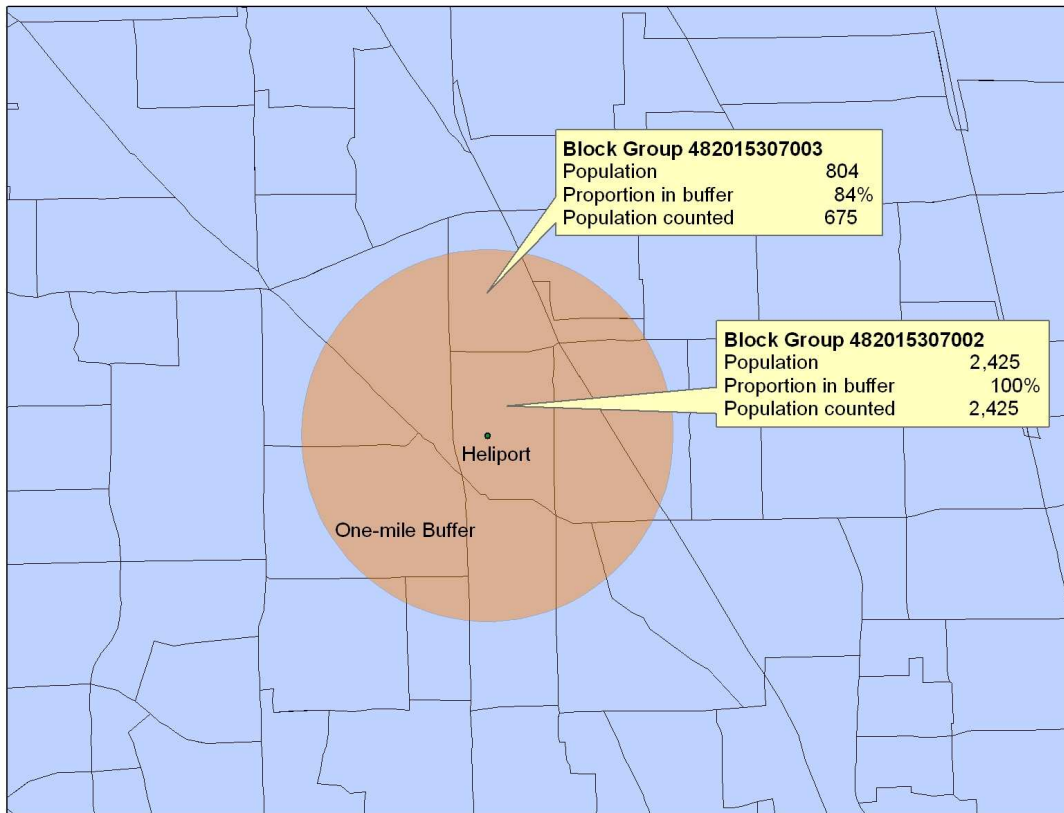


Figure 1. Calculating populations around a facility.

Each facility is represented by a single point in space. Large refineries and other complexes may cover significant acreage. They are also often located in industrial areas with little nearby housing. A 1-mile radius around the plotted point for a large facility may not encompass a significant impacted zone beyond the facility fence and thereby underestimate the impact of the facility. To address this issue, we estimated the population within a 5-mile radius of larger facilities. BOEM identified “large” facilities as: refineries, petrochemical plants, shipyards, platform fabrication yards, and pipe coating facilities. Since the area of a circle increases by the square of the distance, a 5-mile buffer area is 25 times as large as a 1-mile buffer area, ($\pi 5^2 : \pi 1$). We divided the population in the 5-mile area by 25 to make it comparable to the 1-mile

populations. Essentially, the comparison is in terms of population density in the neighborhood expressed in terms of population per π square miles.

Table 7 presents a summary of the data by category and state. The data show significant variation across states. For example, the average population within a one-mile radius of repair and maintenance facilities is 945 in Mississippi but is 6,869 in Alabama and for supply base facilities the average in Florida is zero but is 6,775 in Texas. Within states, the top two infrastructure types in terms of population also show significant variation. Facilities with the highest surrounding populations are repair and maintenance and platform fabrication facilities in Alabama, shipyards and repair and maintenance facilities in Florida, repair and maintenance and supply base facilities in Louisiana, platform fabrication and supply base facilities in Mississippi, and supply base and repair and maintenance facilities in Texas.

The data in Table 7 indicate:

- Repair and maintenance facilities have the highest average population at 5,756 people living within a one-mile radius, and a median population of 3,640.
- Supply bases have the second highest average population at 5,364 people living within a one-mile radius, and a median population of 2,174.
- Natural gas storage facilities have the lowest average population at 471 people living within a one-mile radius, and a median population of 138.

The difference between the median and average values indicates a skewed distribution with one or more large observations.

Table 7

Average Population within a One-Mile Radius by Industry and State

Infrastructure Type	Alabama			Florida			Louisiana			Mississippi			Texas		
	Estab.	Sum	Avg.	Estab.	Sum	Avg.	Estab.	Sum	Avg.	Estab.	Sum	Avg.	Estab.	Sum	Avg.
Helipad	1	725	725	0	0	0	20	21,567	1,078	0	0	0	12	20,832	1,736
Heliport	4	1,439	360	34	158,543	4,663	81	126,276	1,559	6	2,764	461	121	606,147	5,009
Natural Gas Processing	2	252	126	1	173	173	38	19,647	517	1	46	46	40	29,485	737
Natural Gas Storage	1	132	132	0	0	0	7	1,765	252	0	0	0	9	6,114	679
Petrochemical Manufacturing	0	0	0	0	0	0	17	29,565	1,739	1	4,538	4,538	53	165,466	3,122
Pipe Coating	1	150	150	1	3,354	3,354	5	4,275	855	0	0	0	6	24,117	4,020
Platform Fabrication	1	6,079	6,079	0	0	0	31	88,222	2,846	4	27,290	6,822	7	10,926	1,561
Port Terminal	1	1,232	1,232	5	16,720	3,344	10	35,264	3,526	3	5,095	1,698	10	23,078	2,308
Refinery	2	7,493	3,747	0	0	0	12	34,183	2,849	1	3,342	3,342	23	82,166	3,572
Repair and Maintenance	2	13,738	6,869	3	15,180	5,060	45	265,752	5,906	1	945	945	36	205,162	5,699
Shipyards	12	11,312	943	11	55,996	5,091	54	183,980	3,407	8	11,502	1,438	17	54,922	3,231
Supply Base	7	26,294	3,756	0	0	0	51	243,193	4,768	2	8,592	4,296	31	210,025	6,775
Terminal	18	20,417	1,134	27	73,367	2,717	288	650,159	2,257	10	15,932	1,593	286	298,379	1,043
Waste Management	1	310	310	0	0	0	19	19,683	1,036	0	0	0	9	3,493	388

Source: ERG analysis.

Table 8 summarizes the population data by type of infrastructure. Based on the average and the median parameters, repair and maintenance facilities tend to have the largest population living within a one-mile radius. Supply base facilities have the second highest average population living within a one-mile radius, while the second highest median belongs to refineries. Natural gas processing and natural gas storage facilities switch between the lowest and the second to lowest average and median population living within a one-mile radius.

Table 8
Population within a One-Mile Radius by Category

	Count	Sum	Average	Min	1st Quartile	Median	3rd Quartile	Max
Helipad	33	43,125	1,307	0	11	139	725	8,520
Heliport	246	895,168	3,639	0	83	1,061	4,660	38,560
Natural Gas Processing	82	49,603	605	0	24	107	352	15,850
Natural Gas Storage	17	8,011	471	34	93	138	538	2,498
Petrochemical Manufacturing	71	199,569	2,811	0	258	1,192	4,280	22,204
Pipe Coating	13	31,896	2,454	150	469	1,451	3,354	8,128
Platform Fabrication	43	132,516	3,082	16	503	904	5,836	10,999
Port Terminal	29	81,389	2,807	2	344	1,672	4,051	13,299
Refinery	38	127,184	3,347	21	558	2,627	5,570	11,736
Repair and Maintenance	87	500,776	5,756	11	945	3,640	8,094	33,885
Shipyards	102	317,713	3,115	0	350	1,580	4,133	17,591
Supply Base	91	488,104	5,364	2	95	2,174	7,479	36,111
Terminal	629	1,058,254	1,682	0	89	386	1,683	15,151
Waste Management	29	23,487	810	1	93	201	629	10,387

Source: ERG analysis.

In sum, repair and maintenance facilities have the highest average population living within one-mile at 5,756 people and are assigned a weight of fourteen. Supply bases average 5,364 people and are assigned a weight of thirteen. Heliports average 3,639 people and are assigned a weight of twelve. Refineries average 3,347 people and are assigned a weight of eleven. Shipyards average 3,115 people and are assigned a weight of ten. In decreasing order, platform fabrication, petrochemical manufacturing, port terminals, pipe coating, terminals, helipads, waste management, and natural gas processing facilities are assigned weights nine through two. Finally, natural gas storage facilities average 471 people and are assigned a weight of one.

Population is the one variable for which complete data can be estimated for each facility. Thus, the accuracy and precision for this parameter exceeds that for employment and pollutant releases.

2.3.4. Category by Parameter

In this option, the weight bears a relationship to the average parameter. The basic unit is chosen as the nearest whole number value that will make the weight of the lowest average value for the parameter approximately equal to one. This approach represents an increase in the amount of

information that can be gained in the analysis due to wider range in weight values possible for a facility.

2.3.4.1. Employees

The basic unit is 25 employees with a weight of one. Table 9 summarizes the weights.

Table 9

Weights by Number of Employees

Number of Employees	Weight
≤ 25	1
26 to 50	2
51 to 100	4
101 to 500	20
501 to 1000	40
1000+	80

Source: ERG estimates.

2.3.4.2. Pollutant Releases

The basic unit is 3,000 lbs. with a weight of one. Facilities that do not report TRI releases are assigned a weight of one. Table 10 summarizes the weights.

Table 10

Weights by TRI Releases

Category	Weight
No TRI Releases	1
Supply Base	2
Terminal	
Platform fabrication, Repair and maintenance, and Shipyards	19
Pipe Coating	29
Refinery	269
Petrochemical Manufacturing	312

Source: ERG estimates.

2.3.4.3. Population

The weight of each infrastructure type is the average population living within one-mile/five-mile radius of that infrastructure type divided by the basic unit. The basic unit is 400 people with a weight of one. Table 11 summarizes the weights.

Table 11

Weights by Population

Category	Weight
Helipad	3
Heliport	9
Natural Gas Processing	2
Natural Gas Storage	1
Petrochemical Manufacturing	7
Pipe Coating	6
Platform Fabrication	8
Port Terminal	7
Refinery	8
Repair and Maintenance	14
Shipyards	8
Supply Base	13
Terminal	4
Waste Management	2

Source: ERG estimates.

2.3.5. Facility by Parameter

In this option, each facility is assigned a weight based on the facility-specific value for a parameter to the extent that such data are available for a facility. While this approach might appear to provide the most detailed data for the analysis, complete employment and pollutant release information does not exist for all facilities. Thus, the uncertainty increases in many of the cases.

2.3.5.1. Employees

As mentioned in Section 2.3.3.1, the BOEM/LSU data set had employee counts for petrochemical manufacturing and refining facilities. For these two types of infrastructure, each facility is assigned a weight based on the number of employees. The basic unit is 25 employees with a weight of one. For all other infrastructure types, the facility weight is assigned according to the average number of employees for that infrastructure type (i.e., the same as the Category by Parameter weight).

2.3.5.2. Pollutant Releases

For OCS-related facilities identified by name and location in the TRI database, the facility is assigned a weight based on the number of pounds released. The basic unit is 3,000 pounds with a weight of one. For facilities that could not be identified, the weight is assigned according to the average release for the infrastructure category (i.e., same as the Category by Parameter weight).

2.3.5.3. Population

Each facility is assigned a weight proportional to the population within a one-mile/five-mile radius. The weight of each facility is the population living within one-mile of that facility divided by the basic unit. The basic unit is 400 people with a weight of one.

2.4. Combining Measurements

With three parameters and five levels of measurement for each parameter, theoretically, there are 125 combinations to evaluate. The basic and simple options (Sections 2.3.1 and 2.3.2) generate the same outcomes regardless of which parameter is considered. As a result, 27 of the 125 combinations incorporate more detailed information in the measurement options.

County weights are the sum of the weights for all OCS-related facilities within the county. Table 12 summarizes a selection of the county weights under each of the three schemes for employees, releases, and population. What is apparent is that any combination based on the raw aggregate weights would be dominated by the pollutant release data. In many examples, the weight calculated on pollutant releases is nearly ten times higher than those based on employees or population. Because of this disparity, ERG rejected methods to combine the weighting schemes based on raw aggregate weights.

Instead, ERG opted to combine the weighting methods based on the sum of the ranks for each parameter. As the name implies, the sum of ranks method entails adding together the ranks of each county under each of the weighting schemes. A low sum indicates higher ranking and, therefore, greater impacts. A low ranking on one scheme may offset high rankings on others.

Table 12

Summary of County Weights by Employees, Releases, and Population

County Name	State	Employee			TRI			Population		
		Cat. Rank	Cat. Emp.	Facility Emp.	Category Rank	Category TRI	Facility TRI	Category Rank	Category Pop	Fac. Pop
Harris	TX	496	1,149	1,158	560	11,039	10,253	1,967	1,667	2,959
Jefferson	TX	163	312	472	198	1,996	6,985	636	531	307
Galveston	TX	162	398	341	193	3,940	7,175	574	498	364
Calcasieu	LA	82	205	227	93	1,535	1,307	295	248	185
Nueces	TX	80	294	222	101	2,346	2,469	276	228	210
Jefferson	LA	187	181	181	199	885	3,256	750	664	2,333
Brazoria	TX	122	175	160	137	1,783	12,087	528	464	177
Jackson	MS	70	115	155	66	796	159	223	187	148
Plaquemines	LA	155	164	144	200	585	306	728	611	40
St. Charles	LA	30	78	138	44	619	5,679	110	91	84
Matagorda	TX	30	90	130	30	907	21	96	79	1
Mobile	AL	119	174	115	117	913	386	420	365	222
St. James	LA	25	75	115	40	615	383	90	75	7
West Baton Rouge	LA	25	94	114	27	587	116	74	60	7
St. Mary	LA	126	108	108	94	441	80	385	360	148
St. John the Baptist	LA	23	87	107	29	907	334	69	61	29
Ascension	LA	12	26	106	16	324	3,913	41	34	12
Lafourche	LA	121	99	99	124	309	3	515	439	54
East Baton Rouge	LA	42	117	85	48	1,272	2,487	131	113	175
Orleans	LA	91	84	84	79	349	1	337	314	831
Cameron	LA	95	73	73	123	157	0	464	396	35
Iberia	LA	75	64	64	63	365	30	211	181	104
Terrebonne	LA	67	63	63	50	269	0	169	143	93
Vermilion	LA	84	57	57	56	168	0	337	287	39
San Patricio	TX	51	75	55	49	742	28	144	123	23

ERG examined five combined measurement options. These are summarized in Table 13. Combinations A and A.1 both examine the same three measures: category by employees, category by releases, and facility by population. They differ in the relative importance assigned to a parameter. In Combination A, all three parameters have equal importance (for a weight of 33 percent). In Combination A.1, population is considered as important as employees and releases combined and is thus given a weight of 50 percent.

Combination B considered employees, releases, and population of equal importance. In this combination, however, the measures are category by rank for employees and releases and category by population.

Combinations C and C.1 use the same measures for employees and releases as Combination B. However, population is evaluated on a facility-specific basis. Combination C considered

employees, releases, and population to be of equal importance while Combination C.1 considers population as important as employees and releases combined.

Table 13

Description of Combined Weighting Schemes

Socioeconomic Parameters for Weighting Schemes				
Combination		Employees	TRI Releases	Population
A	Scheme	Category by Employees	Category by Releases	Facility by Population
	Weight	33%	33%	33%
A.1	Scheme	Category by Employees	Category by Releases	Facility by Population
	Weight	25%	25%	50%
B	Scheme	Category by Rank	Category by Rank	Category by Population
	Weight	33%	33%	33%
C	Scheme	Category by Rank	Category by Rank	Facility by Population
	Weight	33%	33%	33%
C.1	Scheme	Category by Employees	Category by Rank	Facility by Population
	Weight	25%	25%	50%

Table 14 presents the results of the preliminary combined rankings based on the May 2006 BOEM/LSU data. Harris County, Texas is consistently ranked as having the highest concentration of OCS-related infrastructure. Whether you consider Galveston, TX, or Jefferson, LA, to have the second highest concentration of OCS-related infrastructure depends on which combination is selected as the basis for analysis. Combination C tends to fall in between Combination A and B. East Baton Rouge, LA, for example, is 9th under Combination A, 21st under Combination B and about 17th under Combination C. Placing more weight on population in the combination does not greatly affect the ranking of the top 20 counties. The alternate distributions A.1 and C.1 begin to show marked differences further down in the rankings. This implies that the choice of weights between employees, TRI releases, and population will matter more to the fringe counties without having a large impact on the top 20 counties.

Based on the relative coherence of the results and discussions with BOEM and LSU staff, Combination C is the method for identifying regions with high concentration of OCS-related infrastructure. The method is the simplest that results in identifying the areas with high infrastructure concentration. Thus, it helps provide clarity, transparency, and reproducibility to this and potential future analyses.

Table 14

Preliminary County Ranks by Combination Weighting Schemes

County Name	State	Combination				
		A	A.1	B	C	C.1
Harris	TX	1	1	1	1	1
Galveston	TX	2	2	5	3	3
Jefferson, TX	TX	3	3	4	3	4
Nueces	TX	4	5	12	9	8
Jefferson, LA	LA	5	4	2	2	2
Calcasieu	LA	6	6	12	11	10
Brazoria	TX	7	8	6	5	7
Mobile	AL	8	7	9	6	6
East Baton Rouge	LA	9	9	21	17	16
Jackson, MS	MS	10	10	15	14	12
St. Mary	LA	11	12	9	8	9
Orleans	LA	12	11	11	7	5
Plaquemines	LA	13	16	3	9	13
St. Charles	LA	13	14	23	21	20
St. John the Baptist	LA	15	18	28	26	30
Iberia	LA	16	15	16	15	15
Hillsborough	FL	17	13	17	13	11
Lafourche	LA	18	19	7	12	14
San Patricio	TX	19	23	19	22	24
Iberville	LA	20	26	27	33	39
Fort Bend	TX	20	17	28	23	22
Terrebonne	LA	22	19	18	17	17
Matagorda	TX	22	30	25	39	43
West Baton Rouge	LA	24	29	28	37	37
Montgomery	TX	25	25	33	33	33
St. Bernard	LA	26	32	24	29	36
Lafayette, LA	LA	27	22	36	27	25
St. James	LA	28	32	26	30	35
St. Tammany	LA	28	24	35	32	31
Bay	FL	30	21	22	20	19

Three patterns characterize the concentration of infrastructure.

- Numerous service facilities plus Refining – e.g., Harris, Jefferson, Galveston, Texas. These counties have many field service industries as well as several refineries and petrochemical plants that boost employment and pollutant releases.

- Few service facilities but a few large employers –e.g., St. Charles, St. James, Ascension, Louisiana. These counties have relatively few facilities but many of the ones they do have employ a considerable number of people. Hence, they were farther down the rankings based on facility counts but rose when employment was considered.
- Many small service facilities –e.g., Jefferson, Plaquemines, Lafourche, Louisiana. These counties have many facilities but they have low employment at each one.

Thus, any of the weighting combinations provides an intuitive improvement over a simple count of facilities. Plaquemines Parish, for example, ranks 2nd on the basis of facility count. It still ranks highly (3rd) under Combination B where population is done on a category basis. Once facility-specific information is included, as in Combinations A and C, Plaquemines Parish’s rank drops to between 9th and 16th place.

Finally, ERG performed sensitivity analyses to evaluate the robustness of the method to identify areas with high concentrations of OCS-related infrastructure. These included examining the county rankings with and without heliports and helipads, 1-mile radii for all infrastructure types, and standardizing the weight scores based on the standard deviation of the county weights for each parameter. None of the alternatives generated results that differed markedly from the selected ranking method.

2.5. Areas with High Concentrations of OCS-Related Infrastructure

The final ranking of geospatial units by concentration of OCS-related infrastructure was performed on updated shape files sent by BOEM/LSU in November 2006. The infrastructure concentration was estimated as equal weights of:

- Employees—Category by Rank
- TRI releases—Category by Rank
- Population—Facility by Population.

ERG performed the ranking for BOEM economic areas, labor market areas, counties/parishes, tracts, and blocks. Blocks are Census units that contain from 600 to 3,000 people. Tracts are aggregations of neighboring block groups to get 1,500 to 8,000 people.

2.5.1. BOEM Economic Areas

Each Gulf State is divided into one to four economic areas. Texas and Louisiana economic areas dominate the rankings shown in Table 15 and Figure 2.

Table 15

Economic Area Ranking

Rank	Economic Area	Sum of Ranks
1	TX3	3
2	LA4	6
3	LA3	9
4	TX2	15
5	LA2	18
5	TX1	18
7	LA1	20
8	AL1	24
8	FL3	24
10	MS1	30
11	FL1	33
12	FL4	34

Source: ERG estimates.

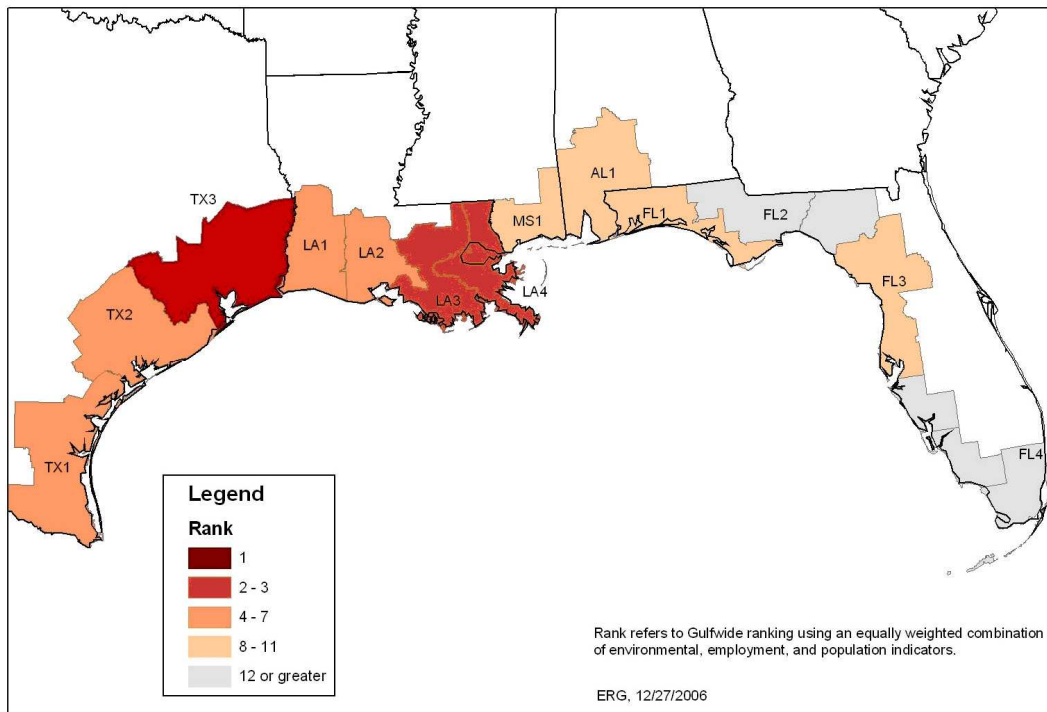


Figure 2. BOEM economic areas: Infrastructure concentration ranks.

2.5.2. Labor Market Areas

Labor market areas are aggregations of counties, so the Houston and New Orleans areas have the highest ranks. The ranks are listed in Table 16 and shown in Figure 3.

Table 16

Labor Market Area Rankings

Rank	Economic Area	Labor Market Area	Sum of Ranks
1	TX3	B	3
2	LA4	A	6
3	LA3	B	11
4	TX3	A	13
5	LA2	A	19
5	TX1	B	19
7	LA1	A	20
8	TX2	A	26
9	AL1	A	27
9	FL3	C	27
11	LA3	A	29
12	MS1	A	35
13	FL1	A	42
14	TX2	B	43
15	FL1	B	46
16	TX1	A	47
17	FL4	C	54
18	FL4	B	55

Source: ERG estimates.

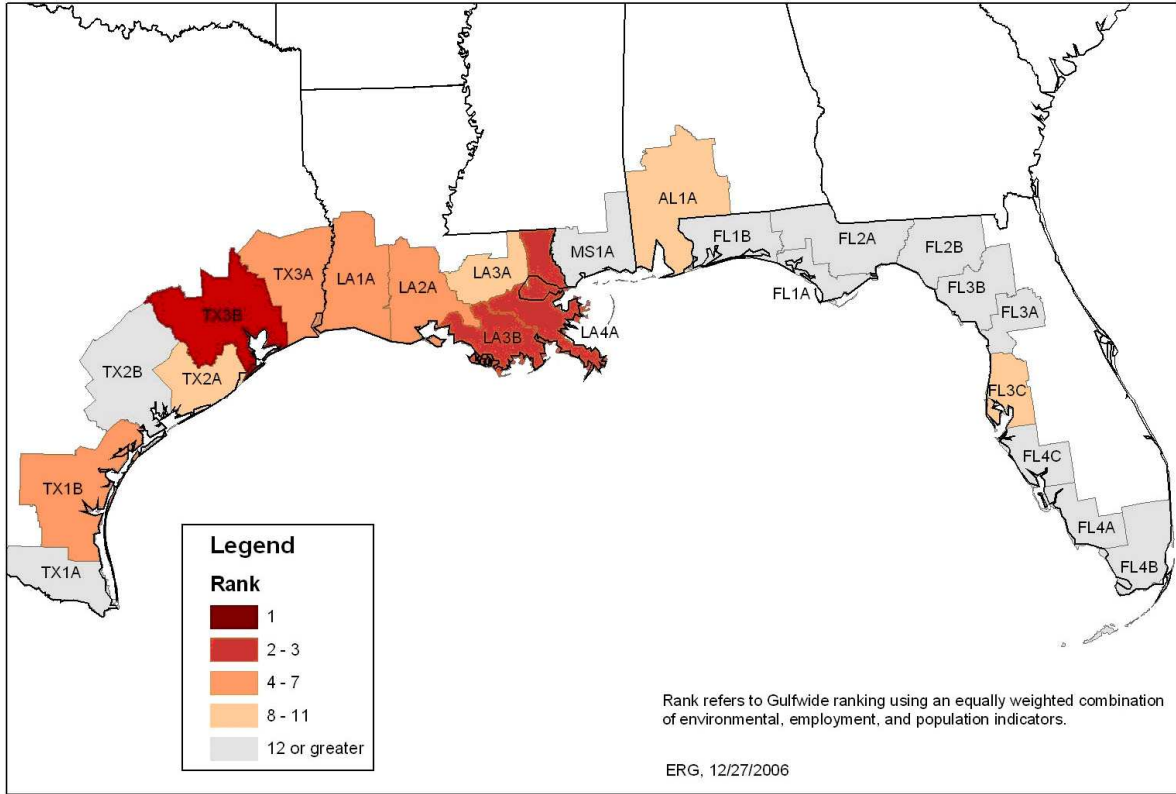


Figure 3. Labor market areas: Infrastructure concentration ranks.

2.5.3. Counties/Parishes

Table 17 lists the top 40 counties/parishes with respect to infrastructure concentration. Figure 4 shows the coastal area from Texas to western Alabama. The top five counties/parishes are labeled in a bold font with a white margin. Counties/parishes with ranks from six to 20 are labeled with an unbolded font. Counties/parishes with ranks from 21 to 40 are labeled with a smaller unbolded font.

Table 17**Final Top 40 Rankings of Counties/Parishes**

Rank	County/Parish	State	Sum of Ranks
1	Harris	TX	3
2	Jefferson	LA	6
3	Galveston	TX	13
3	Jefferson	TX	13
5	Plaquemines	LA	17
6	Brazoria	TX	22
7	Mobile	AL	25
8	Orleans	LA	27
9	St. Mary	LA	31
10	Nueces	TX	34
11	Calcasieu	LA	36
12	Hillsborough	FL	40
13	Lafourche	LA	45
14	Iberia	LA	48
15	Cameron	LA	49
15	Jackson	MS	49
17	East Baton Rouge	LA	52
18	St. Bernard	LA	53
19	Terrebonne	LA	56
19	Vermilion	LA	56
21	Bay	FL	64
22	St. Charles	LA	65
22	San Patricio	TX	65
24	Fort Bend	TX	79
25	Calhoun	TX	84
26	St. John the Baptist	LA	91
27	West Baton Rouge	LA	92
28	Iberville	LA	93
29	Cameron	TX	94
30	St. James	LA	95
31	Harrison	MS	96
32	Lafayette	LA	97
33	Montgomery	TX	99
34	St. Tammany	LA	101
34	Aransas	TX	101
36	Escambia	FL	102
37	Matagorda	TX	105
38	Orange	TX	106
39	Miami-Dade	FL	107
39	Pinellas	FL	107

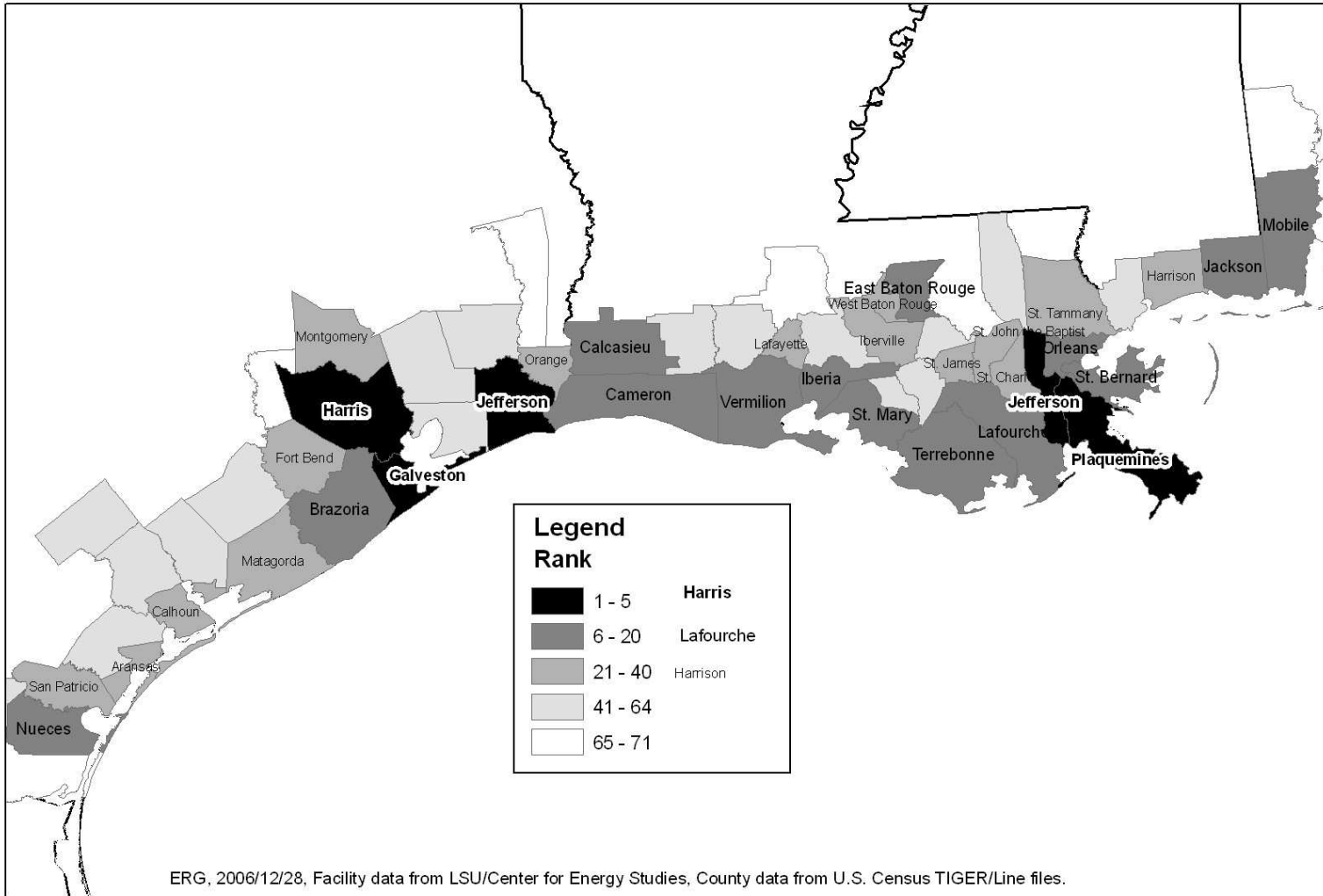


Figure 4. Counties/Parishes: Infrastructure concentration ranks.

3. HURRICANES, INFRASTRUCTURE CONCENTRATIONS, AND COMMUNITIES OF INTEREST

3.1. Overview

ERG obtained storm surge and wind speed data for Hurricanes Katrina and Rita from the Federal Emergency Management Agency (FEMA). The storm surge data are presented in Section 3.2 while wind speed data are given in Section 3.3. The overlay of this information with OCS-concentration, discussed in Section 3.3 results in the identification of six communities of interest. The community profiles are presented in Chapters Four through Nine.

3.1.1. Hurricane Katrina

Hurricane Katrina made landfall three times along the United States coast and reached Category 5 at its peak intensity. The storm initially developed as a tropical depression in the southeastern Bahamas on August 23, 2005. Two days later, it strengthened into a Category 1 hurricane a few hours before making its first landfall between Hallandale Beach and North Miami Beach, Florida. After crossing the tip of the Florida peninsula, Katrina followed a westward track across the Gulf of Mexico before turning to the northwest toward the Gulf Coast.

Hurricane Katrina made its second landfall as a strong Category 4 hurricane in Plaquemines Parish, Louisiana, on August 29, 2005. Wind speeds of over 140 miles per hour (mph) were recorded in southeastern Louisiana and winds gusted to over 100 mph in New Orleans, just west of the eye. As Katrina made its third and final landfall four hours later along the Mississippi/Louisiana border, wind speeds were approximately 125 mph. Hurricane-force winds extended up to 190 miles from the center of the storm and tropical storm-force winds extended for approximately 440 miles. The strength and extent of Hurricane Katrina's wind field resulted in a storm surge greater than historical maximums. The combination of a storm surge of up to 30 feet, wave action, and high winds resulted in destruction of buildings and roads in the affected areas. In addition, failure of earthen levees and floodwalls after the storm passed left portions of New Orleans under 20 feet of water (USDHS, FEMA, 2006a).

3.1.2. Hurricane Rita

On September 24, 2005, Hurricane Rita made landfall near the Louisiana-Texas border as a Category 3 hurricane, with maximum sustained winds of 120 miles per hour. Reaching Category 5 status while in the Gulf of Mexico but weakening before landfall, Hurricane Rita caused extensive coastal flooding, erosion, and wind damage. Sustained, hurricane-force winds extended more than 150 miles inland, and tropical storm-force winds reached the Arkansas-Louisiana-Texas border.

Storm surge elevations from Hurricane Rita have been estimated at 15 feet near the landfall site. The surge plus wave action caused widespread damage to infrastructure and buildings throughout low-lying coastal communities and inland parishes. The storm's flooding impacts were not limited to the landfall area; surge of up to 8 feet was observed in New Orleans, breaching levees that had been provisionally repaired after Hurricane Katrina. As the storm

moved inland and became a Tropical Storm, heavy rainfall also caused localized flooding (USDHS, FEMA, 2006c).

3.2. Storm Surge Data

FEMA produced two sets of high-resolution maps that show flood impacts from these storms for Louisiana and Mississippi.³ The Hurricane Katrina Recovery Maps cover the parishes where Katrina's storm surge exceeded the coastal flooding caused by Hurricane Rita—Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. John the Baptist, St. Tammany, and Tangipahoa—as well as Hancock, Harrison, and Jackson Counties in Mississippi (USDHS, FEMA, 2006b). The Hurricane Rita Recovery Maps cover portions of nine coastal Louisiana parishes: Calcasieu, Cameron, Iberia, Lafourche, St. Charles, St. John the Baptist, St. Mary, Terrebonne, and Vermilion (USDHS, FEMA, 2006c). FEMA (2006d) presents details on how the maps were generated.

ERG used ArcMap 9 (ESRI software) to combine the storm surge data with the OCS-related infrastructure.⁴ The result is shown in Figure 5. The coastal parishes of Louisiana are totally or heavily inundated—Cameron, Vermillion, St. Mary, Terrebonne, Lafourche, Plaquemines, Jefferson, St. Bernard, and Orleans—with inundation damage continuing along the coast through Mississippi.

3.3. Wind Speed

Figure 6 shows the maximum wind speeds experienced during Hurricanes Katrina and Rita. Hurricane Katrina's path can be traced through Plaquemines, Lafourche, Jefferson, St. Bernard, Orleans, St. John the Baptist, and St. Tammany parishes in Louisiana and Harrison, MS. Hurricane Rita's landfall is most apparent in Cameron parish while hurricane strength winds were felt as far west as Harris County, Texas. The top five counties have their names in bold with a white margin around them. Counties with ranks from 6 to 20 have their names in an unbolded font. Counties with ranks from 21 to 40 have their names in a smaller unbolded font. That is, you can see the strongest winds moving north through Harrison county, MS as well as knowing that Harrison county, MS has a rank between 21 and 40.

³ Flooding impacts from Hurricane Rita were severe in Texas, but FEMA prepared recovery maps only prepared for Louisiana because the observed coastal flooding was significantly greater than the flood levels shown on current Flood Insurance Rate Maps (USDHS, FEMA, 2006c).

⁴ ERG followed FGDC Metadata standards to document each layer.

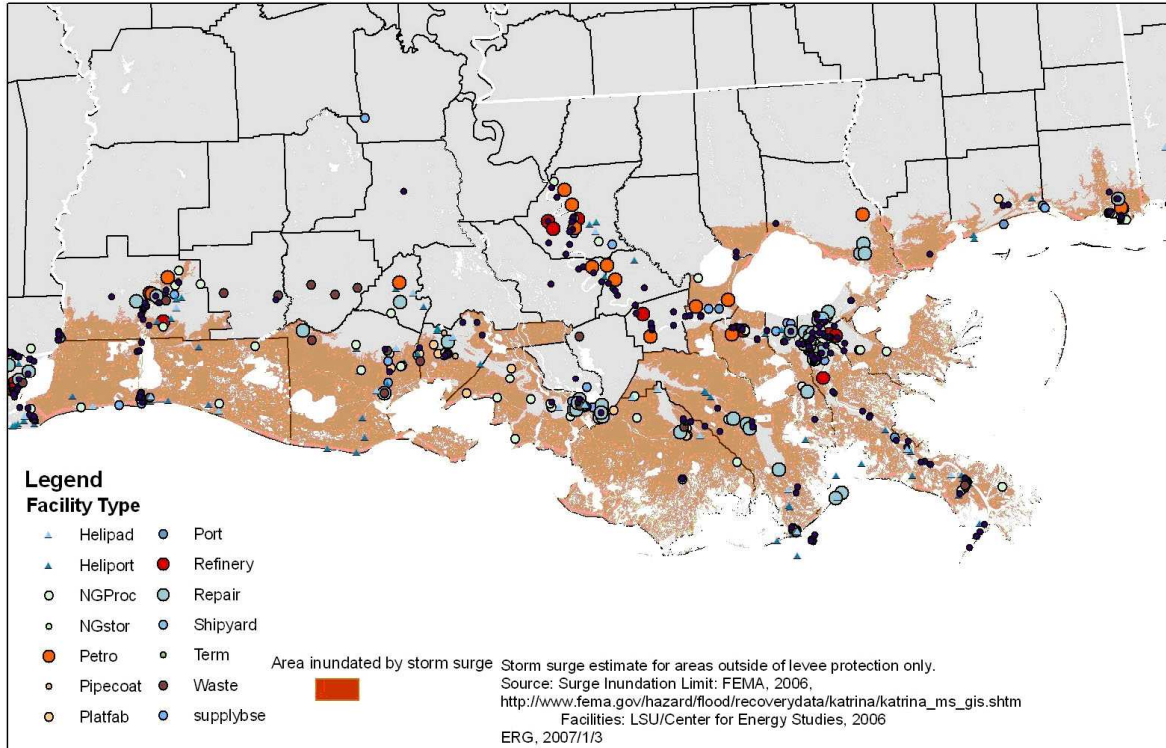


Figure 5. Storm surge limits for Hurricanes Katrina and Rita.

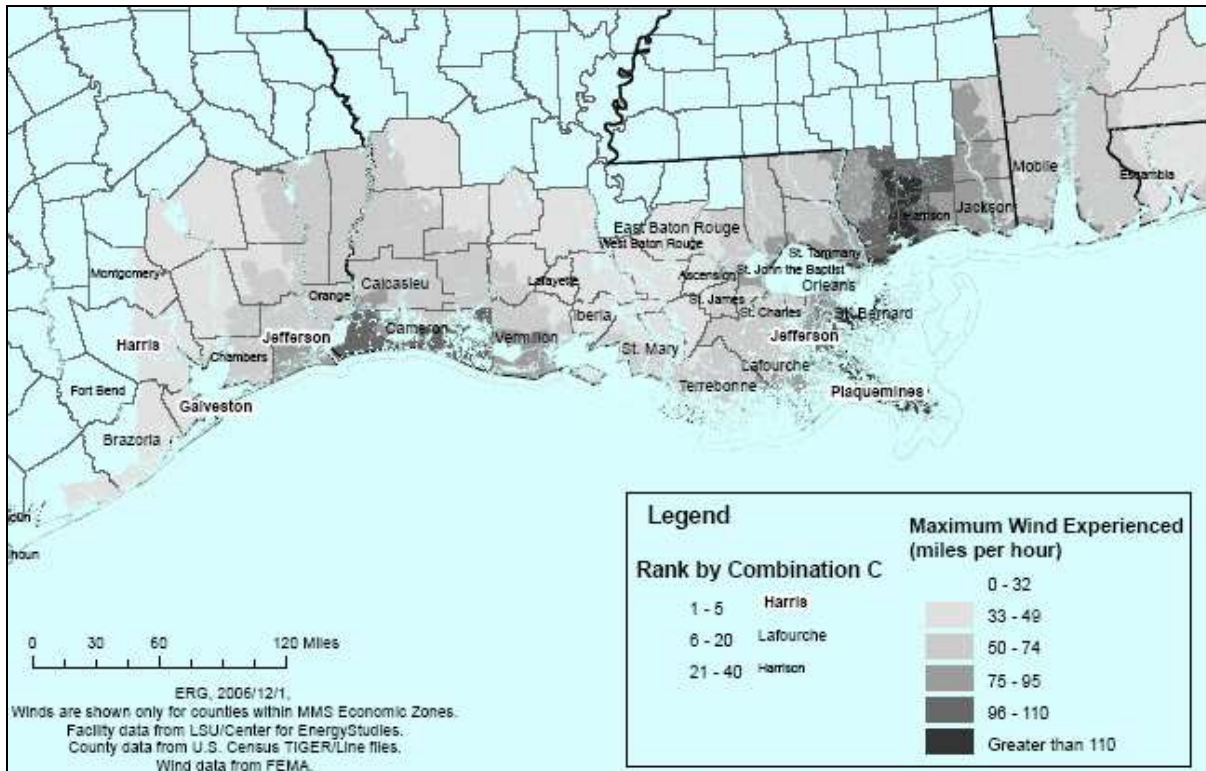


Figure 6. Wind speeds for Hurricanes Katrina and Rita.

3.4. Communities of Interest

Based on Figures 5 and 6, ERG selected the following counties and parishes for the community profiles:

- Harris County, TX (Chapter 4)
- This county consistently ranked highest in OCS-related infrastructure under all weighting schemes examined by ERG. This county is also within the path of Hurricane Rita's wind damage.

- Jefferson County, TX (Chapter 5)
- One of the top 5 communities with respect to OCS-related infrastructure, Jefferson County was in Hurricane Rita's path.

- Plaquemines Parish, LA (Chapter 6)
- Jefferson Parish, LA (Chapter 7)
- St. Bernard Parish, LA (Chapter 8)
- Orleans Parish, LA (Chapter 9).

These communities form a nexus of high concentration of OCS-related infrastructure and Hurricane Katrina's wind and storm surge damage.

4. HARRIS COUNTY, TEXAS

4.1. Introduction

Harris County is the central county of the Houston Metropolitan Area and the City of Houston comprises most of its 1,778 square mile land area. Houston is the fourth largest city in the United States and the county seat of Harris County. Its geographic coordinates are 29°45'N and 95°21'W.

The estimated population of Harris County in 2005 is 3,693,050, making this county the largest in the state and third largest in the United States (USDOC, Census, 2005a). Roughly 27 percent of the county lies outside of urban and suburban components of the city and, as such, may be considered rural. The county is bordered by Montgomery County to the north, Liberty County to the northeast, Chambers County to the east, Galveston County to the southeast, Brazoria County to the south, Fort Bend County to the southwest, and Waller County to the northwest (TSHA, 2001).

Southern sections of Harris County are characterized by coastal prairie. The northern sections are rolling timberland. Elevations range between sea level and 200 feet. The soil is characteristically heavy black coastal clay in the south and sandy loam north of Buffalo Bayou. The watershed associated with this area is better known in its last sixteen miles as the Houston Ship Channel which bisects the county “from west to east before joining the north-to-south San Jacinto River just above its estuary at Morgan’s Point on upper Galveston Bay” (TSHA, 2001). Rainfall averages 48 inches annually. Average annual temperature is 69 degrees (TSHA, 2001). Of the rare/endangered species found in Texas, only the bald eagle (*Haliaeetus leucocephalus*) is specific to Harris County (Texas Center for Policy Studies, 2000).

Harris County’s economic base has a primary focus on its oil and gas extraction and processing activities but has also diversified to compete nationally as a leader in manufacturing, a prominent corporate center, and a major publishing center. The county is first in the nation for producing petroleum equipment, agriculture chemicals, fertilizers, and pesticides. In 2000, Harris County produced 2,706,287 barrels of oil, which was a decrease of 12 percent from 1999. The county also produced 149,448,720 thousand cubic feet of gas well gas, and 7,067,815 thousand cubic feet total casinghead gas (TSHA, 2003).

4.2. Built Environment

4.2.1. Human Geography/Population Centers

The majority of Harris County’s population resides in the city of Houston and in the extensive suburban areas surrounding the city. Other cities in Harris County include: Baytown (68,371), Bellaire (17,206), Bunker Hill Village (3,710), Deer Park (28,993), El Lago (2,963), Galena Park (10,221), Hedwig Village (2,295), Hilshire Village (720), Houston (2,016,582), Humble (14,803), Hunters Creek Village (4,445), Jacinto City (9,945), Jersey Village (7,087), Katy (13,225), LaPorte (33,136), Morgan’s Point (342), Nassau Bay (4,056), Pasadena (143,852), Piney Point Village (3,421), Seabrook (10,907), Shoreacres (1,588), South Houston (16,219),

Southside Place (1,600), Spring Valley (3,599), Taylor Lake Village (3,547), Tomball (9,938), Webster (8,852), and West University Place (14,886) (USDOC, Census, 2005a).

4.2.2. Transportation and Communication

Harris County contains over 9,171 miles of roads (Texas Association of Counties, 2004a). Major interstates and state highways converge in Harris County, giving the area a high degree of access to other regions in Texas and across the country. Because Harris County is a major shipping point, many communities across the county are served by a large number of carriers. One hundred and two common carriers serve Baytown, as does the Union Pacific railroad (Baytown, 2006; TxDOT, 2006). In Deer Park, 44 common carriers and one rail service provider serve the area (TxDOT, 2006). More than 4,000 common carriers serve Houston as do the Union Pacific, Burlington Northern Santa Fe, and the Port Terminal Railroad Association (TxDOT, 2006; Port of Houston Authority, 2006). Two hundred and twenty three common carriers serve Katy (TxDOT, 2006).

George Bush Intercontinental Airport and William P. Hobby Airport serve the county (TSHA, 2001). The George Bush Intercontinental Airport is a major facility capable of landing large commercial airliners on its many runways. The second largest airport in the county is the William P. Hobby Airport. This airport serves many large aircraft and is home to 286 aircraft. Eleven smaller airports also serve the county (AirNav.com, 2006).

The major newspapers within the county are: *Houston Post*, *Forward Times*, *Houston Chronicle*, *El Dia*, and the *Houston Business Journal*. Local radio stations that broadcast from the county include: 107.5, 104.1 KRBE FM, 101 KLOL, 96.5 KHMV, 93.7, 92.1 KRTS, 97.1 KRTH, 90.1 KPFT FM, 89.3 KSBJ, 88.7 KUHF, and 950 KPRC. Television coverage provided in the county includes KPRC Channel 2, KUHT Channel 8, KHOU Channel 11, KTRK Channel 13, KRIV Channel 26, and UPN Channel 20 (Internet Over Houston, 2006).

4.2.3. Physical Infrastructure

Houston Lighting and Power provides electricity in Baytown. Water is provided by the City of Baytown and the Coastal Water Authority provides sewer services. Entex, Tenneco, and Channel Industries provide natural gas. Electricity in Clear Lake is provided by Reliant Energy/HL&P and Texas-New Mexico Power. The Clear Lake Water Authority provides water and Entex provides natural gas. In Deer Park, Houston Lighting & Power provides electricity, and the City of Deer Park provides water. Entex provides natural gas. Houston Lighting and Power provides electricity in Houston; water comes from the Evangeline and Chicot Aquifers and from Lakes Houston, Conroe, and Livingston. Entex and Lone Star Gas provide natural gas. Houston Lighting and Power provides electricity in Katy, water is provided by the City of Katy, sewer services are provided by Sanifill, and Entex provides natural gas (Harris County, Texas, 2005). Telephone service for Harris County is provided by Southwestern Bell, GTE, PCS Primeco, AT&T, and Nextel.

4.2.4. Interaction between Built and Physical Environments

Population density offers unique challenges to the landscape of Harris County and a variety of architectural styles and preservation concerns for the community. From the skyscrapers that form the skyline of Houston to the 500 parks located in the city of Houston and Harris County, the area offers diverse landscapes for visitors and residents alike. Smaller communities that form many of Houston's suburbs also have concerns of historic preservation within their own communities.

In 2006, 4,598,386 Harris County residents were served by 645 water systems (USEPA, 2006a). According to the EPA Toxic Release Inventory, Harris County led Texas in terms of total pounds of waste released for 2003 and 2004. In 2004, companies in Harris County reported the following releases:

- a total of 54,952,991 pounds (on and off-site disposal or other releases);
- 8,739,816 pounds of fugitive air releases;
- 9,769,933 pounds were released by stationary sources via stack air (point source emissions);
- 5,429,545 pounds were discharged to surface waters (lakes, rivers, and streams);
- 23,110,255 pounds were disposed of via underground injection wells (Classes I through V); and
- 4,339,257 pounds were disposed in landfills.

Of these releases, the electric utility industry generated 181,523 pounds (USEPA, 2006b). For the 8-hour ozone standard, Harris County was listed as a "non-attainment" area in 2004 and 2005 and most recently received a moderate (0.138 to 0.160 ppm) classification (USEPA, 2006c). Of the top 20 facilities in Texas, in terms of total on- and off-site disposal or other releases, four are located in Harris County and 15 facilities release more than a million pounds (USEPA, 2006b).

The Environmental Protection Agency identifies twelve Superfund sites in Harris County. The first, South Cavalcade Street (EPA Identification # TXD 980810386) lies at the intersection of Cavalcade and Maury Streets, two miles southwest of the intersection of U.S. 59 and the 610 Loop. Although water supplies lie near the site, the affected aquifers are not currently being used to supply water. Approximately 4,500 individuals live within one mile of the site. Three trucking firms have operations at the site (USEPA, 2006a).

Between 1910 and 1962, a wood treating facility operated in this 66-acre site. Accordingly, principal pollutants include creosote and wood treating metal salts, which have contaminated subsurface soil and upper two aquifers. The primary health considerations from the site stem from the carcinogenic polynuclear aromatic hydrocarbons (cPAHSs), volatile organics, and

metal salts associated with creosote and the wood preservation process. The primary aim of remediation is to control groundwater contaminants by preventing them from reaching deep aquifers and, possibly, restoring shallow groundwater. The responsible party, Beazer East, is removing creosote from the aquifer. The first Five-Year Review found the remedy implemented for contaminated soils to be protective of human health and the environment in the short-term; long-term protectiveness will be evaluated further after monitoring wells are in place. The next five-year review will be conducted in the fall of 2007. Deletion from the NPL is scheduled for 2026 (TCEQ, 2006a).

A second Superfund site, Sol Lynn/Industrial Transformers Texas (EPA Identification # TXD 980873327), is located near the 610 Loop in Houston, within ½ mile of the Houston Astrodome and Astroworld Amusement Park. Private, single, and multi-family dwellings are located about 3,000 feet from the site. Commercial businesses and light industrial areas are located directly east of the site. The site is a former scrap metal and electrical transformer salvage and recycling facility, which operated between 1965 and 1975. A chemical recycling and supply company subsequently operated at the same location from 1979 through 1980. The groundwater contaminants include trichloroethylene (TCE) and vinyl chloride (VC). Remediation has been underway for a number of years, beginning with the owner of the site. The Texas Natural Resources Conservation Commission and the EPA are currently overseeing remediation efforts. The proximity of the site to the Houston Astrodome and Six Flags Astroworld amusement park is a concern. The evacuation and disposal of contaminated soil eliminated direct human exposures. The contaminated ground water plume is currently expanding and migrating down gradient (USEPA, 2006a).

Results from a treatability study and the subsequent Remedial Design is expected to be completed in the summer of 2006, with initiation of the remedial action later in 2006. The planned ground water remediation will reduce the expansion of the ground water plume and reduce the human health risks. The shallow water at the site has the potential to be used as drinking water sources. Therefore, EPA is also working to develop and implement institutional controls to restrict the use of ground water. The next Five-Year Review is scheduled for completion by December 9, 2009 (TCEQ, 2006a).

The third site, Sikes Disposal Pits (EPA Identification # TXD 980513956) is located approximately two miles southwest of Crosby, 20 miles northeast of Houston. Approximately 10,000 residents are located in Crosby and its environs. The San Jacinto River lies to the west of the site, Jackson Bayou lies to the north, and old U.S. Highway 90 passes to the south. The 185-acre site lies within the 100-year floodplain of the San Jacinto River (TCEQ, 2006a).

The volumes of waste that have been dumped at this site are cited by the EPA as including “350 million gallons contaminated ground and surface water; 496,254 tons of organic sludge and contaminated soils; and 2,000 drums of mixed waste” (TCEQ, 2006). During the 1960s, wastes from area petrochemical companies were dumped on the site in unlined sand pits until the facility closed in 1967. These wastes included such chemicals as arsenic, mercury, cadmium, chromium, and lead. By 1994, one billion pounds of contaminated soil had been incinerated. EPA states that fishing and hunting occur regularly around the site, although possible threats to human health include contact with site contaminants. Other risks include the proximity of the site

to the floodplain, surface water contamination, and overflow from the main waste pit. Incineration of the wastes is complete, however monitoring continues. The next Five-Year Review is scheduled for completion by September 27, 2006 (TCEQ, 2006a).

The fourth site is the North Cavalcade Street site (EPA Identification # TXD 980873343) (USEPA, 2006a). This site lies approximately one mile southwest of the intersection of U.S. 59 and the North 610 Loop. Approximately 50,000 individuals reside in the urban area in which the site is located. A wood treatment facility operated in 9 of the 23-acre site until the early 1960s. As a result, principal contaminants include creosote in the soil and ground water. EPA estimates that the site contains 10,000 cubic yards of contaminated soil and 11.5 million gallons of contaminated groundwater. The site lies in an area containing industry and warehouses. Health considerations include soil and groundwater contamination. The cleanup strategy involves controlling the migration of groundwater contaminants into deeper aquifers and possibly restoring the shallow groundwater and soils. Plans to clean up the groundwater on the site have been revamped. The site is scheduled for deletion from the NPL in 2020. The next Five-Year Review should be complete in the fall of 2008 (TCEQ, 2006a).

The fifth site, French, Ltd., (EPA Identification # TXD 9805148) lies in northeast Harris County, two miles southwest of Crosby and across the street from Sikes Disposal Pits (USEPA, 2006a). The San Jacinto River is one mile east of the site. Crosby houses approximately 10,000 residents. The nearest residence is within 300 feet of the main pit and the nearest drinking water well lies 1,500 feet from the main pit. This site housed mining operations between 1950 and 1965; petrochemical wastes were disposed on the site from 1966 until 1972, when its permit from the Texas Water Quality Board was revoked and it subsequently closed in 1973. In this 22.5-acre site, the principal pollutants include volatile organic compounds, phenols; heavy metals; and PCBs. The PCBs occur only in sludges while the other pollutants occur in both groundwater and sludges. The EPA estimates the volume of wastes at 8,000 cubic yards of PCB sludges, 38,000 cu. yds. of non-PCB sludges, 25 million gallons of water, and 70,000 cu. yds of soil (TCEQ, 2006a).

EPA began some removal operations in the 1980s. The site is located within the 100-year floodplain of the San Jacinto River and floodwaters reached the site in 1989 and again in 1994, although a flood control wall functioned well during the second period of flooding. Health considerations include contamination of ground water and surface water that are used for drinking and irrigation, air contamination, and risk from direct contact with sludges and soils. Remediation of the waste lagoon was completed in 1993 and it was filled in 1994. Remediation of the aquifer is also complete. Monitoring continues. The next Five-Year Review is scheduled for completion by March 12, 2007 (TCEQ, 2006a).

The sixth site, Geneva Industries/Fuhrmann Energy (EPA Identification # TXD 980748453), lies at 9334 Caniff Road, Houston (USEPA, 2006a). The site is two miles east of Hobby Airport. An estimated 35,000 individuals reside within a one-mile area of the site with the closest residences at less than 50-feet from the east and southwest site boundaries. Of concern is one drinking water well that lies within 300 yards of the site. On this 13-acre site, which includes closed lagoons and a landfill, the principal pollutants include PCBs in soils and shallow ground water, polynuclear aromatic (PNA) compounds in soil and shallow ground water, drums in the landfill, and TCE in

shallow and deep ground water. EPA estimates that 35,000,000 gallons of ground water were contaminated. The site was used for petroleum exploration and production prior to 1967. In 1967, Geneva Industries began petrochemical production at the site, followed by Pilot Industries (the same type of facility) from 1974 to 1984. EPA removal actions began by 1984. The principal health considerations include “high PCB concentrations in soil [which posed] a significant health threat via direct runoff prior to remediation.” Contaminated groundwater has been removed from wells and treated via carbon absorption. Soils and drums have been disposed of off-site. As for its current status, “[the cleanup actions performed by the EPA and the Texas Natural Resource Conservation Commission (TNRCC) have eliminated the potential for exposure to surface contamination while long-term groundwater cleanup activities continue to reduce contamination at the Geneva Industries/Fuhrmann Energy site. The next Five-Year Review is scheduled for completion by September 25, 2008 (TCEQ, 2006a).

The seventh site, The Highlands Acid Pit (EPA Identification # TXD 980514996), is located 15 miles east of Houston and 1.5 miles west of Highlands and is within the 10-year river flood-plain basin (USEPA, 2006a). Located on a peninsula in the San Jacinto River, the six-acre site is prone to flooding and portions of the site are now under water due to subsidence. Approximately 5,000 individuals reside in the area. Principal pollutants include organic compounds (toluene, benzene, phenol, xylenes) and inorganic compounds (sulfate, manganese, arsenic, cadmium, lead, and beryllium). Contaminants from waste sludges have leached into the upper aquifer. Industrial waste sludges were placed in the site in the early 1950s. EPA fenced the site in 1984. The primary health consideration involves a drinking water well that is located 2,000 feet from the site. Most of the remediation is now complete with approximately 22,000 cubic yards of waste and soil removed; monitoring continues (TCEQ, 2006a).

The eighth site is Many Diversified Interests, Inc. (EPA Identification # TXD 008083404), which is located at 3617 Bear St., two miles east of downtown Houston, less than a half-mile north of the Buffalo Bayou. Approximately 500,000 individuals reside in the urban area in which the site is located. Residential areas, an industrial area, and an elementary school are located near the site. In addition, of the 3,952 estimated persons living within ½ mile of the site, 98.9% are a minority resulting in a high potential for environmental justice concerns (USEPA, 2006a).

The site housed the Texas Electric Steel Casing Company (TESCO) beginning in 1926; the buildings were demolished after the plant closed and the company filed for bankruptcy in the 1990s. During the 1980s, Can-Am Resources Group operated a spent catalyst recycling operation on the site. Can-Am “reportedly purchased drums of spent chemicals from refineries and chemical plants and stored the drums on the leased property.” The company stopped operating by 1988, leaving stored drums on the site (USEPA, 2006a).

Chemicals of concern include lead, manganese, molybdenum, and benzo(a)pyrene. Health considerations at the site include contaminated soil in the property boundary, 5,300 leaking drums of chemical waste, and a well within two miles of the site that supplies water to approximately 100 people. Residential soils have been identified and cleaned up by TNRCC (now the TCEQ). The leaking drums of waste and contaminated soils have been removed. As of April 2006 remediation has been completed at 149 residential properties considered high access areas. EPA recently reached an agreement with a prospective purchaser to implement

remediation on part of the site and EPA is currently planning a Remedial Investigation and Feasibility Study (TCEQ, 2006a).

The ninth site, Crystal Chemical Company (EPA Identification # TXD 990707010), lies at 3502 Rogerdale Road, in a residential and light industry area (USEPA, 2006a). The nearest drinking water well lies 300 feet from the site and approximately 20,000 people live within one mile of the five-acre site. Crystal Chemical produced herbicides on the site from 1968 until 1981, when the company declared bankruptcy. Remediation actions by EPA began in 1981; ultimately 400 cubic yards of soil and 2 million gallons of contaminated water were removed from the site. The principal pollutant is arsenic, with concentrations at the subsurface deemed “high.” Three on-site waste ponds lay on the site; total quantity was estimated at 156,000 cubic yards of soil and three million gallons of water. Potential health risks include skin and lung cancer from contact with contaminated soils, ingestion of groundwater and inhalation of contaminated dust. It is not clear to what extent the groundwater contamination can be cleaned completely; some remediation is complete. Most recently, the Union Pacific Railroad Company, who purchased 12 acres of adjoining property, conducted a pilot test in March 2005 and will be planting up to 60 eucalyptus trees to reduce the amount of water processed at the water treatment plant by reducing the water table (TCEQ, 2006).

The tenth site, Brio Refining, Inc. (EPA Identification # TXD 980625453), lies at 2501 Dixie Farm Road, southern Harris County, one to two miles north of Friendswood. The 60-acre site consists of 24 closed pits. Processing included copper catalyst regeneration, oil blending and refining, and styrene cracking (USEPA, 2006a). Approximately 3,600 people live within the 2000 census tract surrounding the site. Developed properties surrounding the site include residential homes and the San Jacinto Community College. The site is currently in an operations and maintenance phase. A notice of direct final deletion from the NPL was published in June 2006 (TCEQ, 2006a).

The eleventh site, Jones Road Ground Water Plume (EPA Identification # TXN000605460) (USEPA, 2006a), lies from the southern end of Echo Spring Lane to Tower Oaks Boulevard and from Timber Hollow to the eastern side of Jones Road. The site is contaminated with tetrachloroethylene (PCE) from the former Bell Dry Cleaners at 11600 Jones Road and other potential sources since this chemical is widely used for dry cleaning of fabrics. This site was listed on the NPL in September of 2003 and is in the proposal and notification stage. As recently as April 2006, letters were sent to well owners, tenants, and businesses. Eight deep monitor wells were installed in July and August of 2005, with two additional deep monitoring wells scheduled. A proposal is also in place to install a water line to provide local residential and commercial well owners with an alternative supply of drinking water (TCEQ, 2006a).

The final site, Patrick Bayou (EPA Identification # TX0000605329), is one of several small bayous of the Houston Ship Channel (HSC) located within the lower portion of the San Jacinto River Basin (USEPA, 2006a). The site is located in an urban, highly industrialized petrochemical area in southeast Harris County north of Deer Park. The bayou is bounded by Occidental Chemical, Shell Refinery, Shell Chemical, and Lubrizol Corporation, all of whom are currently in negotiations with the EPA as the Potentially Responsible Parties (PRPs). The bayou

also receives effluent from the City of Deer Park wastewater treatment plant and an air separation plant, Praxair, Inc. (TCEQ, 2006a).

The principal pollutants include chromium, copper, lead, mercury, nickel, selenium, zinc, hexachlorobenzene (HCB), bis-2-ethylhexyl phthalate, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). A risk assessment will be performed to determine whether site contaminants pose a current or future risk to human health and the environment in the absence of any remedial action (TCEQ, 2006a).

4.3. History

4.3.1. Prehistory

Human habitation in the area that is now Harris County is thought to date back 6,000 years. Shell middens and cemeteries with early ceramics dating from 1400 B.C. and 950 A.D. have been unearthed. Although shell middens were prevalent along the bays and streams of the county, many of those were destroyed during the nineteenth century for construction purposes (TSHA, 2001).

4.3.2. Early Settlement

Not much evidence of European exploration occurring prior to 1821 can be found. Anglo families began to settle in the area in the early 1820s. Much of the settlement was concentrated on waterways, particularly Buffalo Bayou, the San Jacinto River, and the San Jacinto estuary. “By 1833, Harrisburg was an established port of entry for immigrants and freight destined for the upper Brazos River communities of San Felipe and Washington. Moreover, it was the hub for east-west roads (TSHA, 2001).” Originally referred to as the San Jacinto District, it became the Harrisburg District in 1833. The Texas Revolution produced considerable disruption for the area. As it recovered, the Buffalo Bayou, Brazos, and Colorado Railway entered the area (TSHA, 2001).

4.3.3. Economic History

By the time of the Civil War, five other railroads also served the area. Because many of the early settlers came from Southern states, slaves were held in the area both to work in the fields and to labor on cattle ranches. German and French settlers also came to the area. Few Mexicans remained in the Harris County area after 1850, although some located there by the 1880s, drawn by work on the Houston Ship Channel and the railroads. Midwestern developers moved into the area by the last decade of the 19th century, fostering the development of such communities as Pasadena, Deer Park, and LaPorte. At this time, the eastern section of the county was still agricultural (TSHA, 2001).

The industrial base of Harris County began to develop in earnest after the formation of the Harris County Ship Channel Navigation District in 1911. Bonds were quickly issued to finance deepening and widening of the channel, to facilitate entry of oceangoing ships. Petroleum refiners sprang up along Buffalo Bayou and the San Jacinto River by the second decade of the

20th century. These developments fueled dramatic population growth. “The very profitable Harris County Navigation District owns the wharves and warehouses around the turning basin (about two miles above old Harrisburg), the Long Reach docks, and various other facilities, including a bulk handling plant at Greens Bayou, the terminal railroad, and the container facility at the Bayport industrial complex, below Morgan’s Point (TSHA, 2001).” Substantial imports and exports pass through the port (TSHA, 2001).

Oil was first discovered in the area in the first decade of the 20th century, along the San Jacinto estuary. “Migrant roughnecks and their families moved to the area and established a temporary boomtown amid the derricks between 1915 and 1917. The shantytown was replaced in 1917 by Pelly, which was built on private land above the noisy and dirty oil camp. In 1919, Ross Sterling and his Humble Oil and Refining Company (now ExxonMobil) built a refinery on the San Jacinto above the mouth of Goose Creek. The site was bordered by the Humble Company town, Baytown, for workers, and a middle-class enclave, Goose Creek, for executives and others (TSHA, 2001).” The houses were sold to the workers by the 1920s and 1930s, with the three towns first becoming the “Tri-Cities” and then consolidating as Baytown by the end of the 1940s (TSHA, 2001).

Today, Houston is the 10th largest metropolitan statistical area in the U.S., and the busiest port in the country. The Texas Medical Center, which is located in Houston, is the largest medical complex in the world. Houston is also the energy capital of the U.S., as well as the home to NASA’s Johnson Space Center.

4.4. Demographic Characteristics

4.4.1. Population Growth

Harris County has recorded double digit (percentage) growth in every decade since 1920. While the percentage share of growth has tended to decline over time as a function of the enlarging population base, the absolute size of the increase was larger in each decade until the 1980s (Table 18).

Net migration into the county peaked at 394,000 between 1970 and 1980, and declined to a modest 31,000 between 1980 and 1990. What may be most striking about in-migration in this decade is that it occurred despite the deep recession experienced by the county’s oil- and gas-dependent economy. Growth in the 1990s (582,000; net in-migration of 181,000) was slightly less in absolute terms than growth in the 1970s. To put this in perspective, by the 1990s, the spatial dispersion of the Houston Metropolitan Area had pushed the leading centers of suburban growth into neighboring Fort Bend, Montgomery, and Brazoria Counties.

Table 18**Population Changes, Harris County: 1920 to 2005**

Year	Population	Rank in State	Change From Previous Census	Percent Change Previous Census	Rank in Growth Rate	Net Migration Since Previous Census
2005	3,647,656	1	247,078	7		
2000	3,400,578	1	582,379	21	68	181,021
1990	2,818,199	1	408,652	17	65	31,148
1980	2,409,547	1	667,635	38	44	394,119
1970	1,741,912	1	498,754	40	11	268,927
1960	1,243,158	1	436,457	54	17	212,683
1950	806,701	1	277,740	53	22	NA
1940	528,961	1	169,633	47	16	NA
1930	359,328	1	172,661	92	46	NA
1920	186,667	3	70,974	61	24	NA

Source: USDOC, Census, 2005a and 2005c.

4.4.2. Age and Ethnicity

The Harris County population is racially diverse. In 2000, 42 percent of the population was non-Hispanic white, 33 percent Hispanic, 18 percent was African American, and five percent was Asian (Table 19). By 2005, the Hispanic population grew to 37.8 percent of the population, now making up the largest racial group in Harris County, while the non-Hispanic white population declined to 25 percent. The share of African Americans and Asians has remained relatively stable with a less than 1 percent change in each (USDOC, Census, 2005a).

The racial composition of Harris County has changed dramatically since 1970, primarily through the growth of the county's Hispanic and Asian population. In 1930, non-Hispanic whites were 74 percent of the county's population, blacks 20 percent, and Hispanics were 5 percent. The black population percentage has subsequently declined slightly. The Hispanic population share increased to nine percent in 1970, 15 percent in 1980, and 22 percent in 1990. Asian population was negligible in 1970, two percent in 1980, and four percent in 1990.

Table 19

Racial and Ethnic Populations, Harris County

Race/Ethnicity	Population, 2000	Percent, 2000	Population, 2005	Percent, 2005
Non-Hispanic White	1,432,264	42.1	910,564	25.0
African American	619,694	18.2	648,568	17.8
Hispanic	1,119,751	32.9	1,377,242	37.8
American Indian	7,103	0.2	14,870	0.4
Asian	173,026	5.1	201,239	5.5
Pacific Islander	1,392	0.0	3,445	0.1
Other Race	4,499	0.1	441,725	12.1
Two or More Races	42,849	1.3	50,003	1.4

Source: USDOC, Census, 2005a.

Harris County maintains a fairly young median age of 31.2 years compared to other Texas counties in the region. By 2005, the median age has increased slightly to 32.5 years (USDOC, Census, 2005a).

4.5. Economy

4.5.1. Income and Poverty

Median family income in Harris County was \$50,600 in 1990 (constant 2000 dollars). This figure was 115 percent of the state median, but was 24 percent below the 1980 figure of \$66,400 (Table 20). Median family income grew far in excess of the state median between 1970 and 1980, reflecting Harris County's deeper participation in the oil and gas boom of the 1970s. In 1990, 16 percent of county residents lived in households with income below the poverty line, up from ten percent in 1980. Of families below the poverty line in 2000, 33 percent were female-headed; this increased to 43 percent in 2005.

Table 20**Income, Poverty and Family Structure, Harris County: 1950-2005**

Year	Median Family Income (1999 Constant \$)	% Change From Previous Census	Ratio to State Median	Ratio of Income at 80 th and 20 th Percentile	% Persons in Poverty	% Persons Receiving Public Assistance	% Families with Children Female-Headed
2005	42,806	-12.6	1.01		17.9	1.5	42.8
2000	49,004	-3.1	1.07	--	15	2.5	32.8
1990	50,566	-23.8	1.15	4.06	16	6	--
1980	66,363	36.6	1.43	3.88	10	4	--
1970	48,573	36.1	1.22	2.99	12	4	--
1960	35,681	41.9	1.24	2.98	--	--	--
1950	25,140	--	1.30	2.99	--	--	--

Source: USDOC, Census, 2005a.

4.5.2. Employment

In 1940, the manufacturing (21 percent), wholesale and retail trade (23 percent), and service (26 percent) sectors accounted for the majority of the employment of Harris County residents (Table 21). Direct employment in mining in the county's oil and gas dependent economy was never greater than its 1980 peak (56,000; 4.6 percent). However, each of the county's other sectors has historically been strongly dependent on upstream oil and gas extraction and downstream processing activities.

Harris County employment experienced explosive growth in the decade between 1970 and 1980. For example, mining experienced a 176 percent increase in employment of county residents. Especially notable, because of the larger job base, was the 98 percent increase in the construction sector that added more than 62,000 workers in the decade. All sectors except public administration experienced an employment increase of more than 30 percent. In the 1980s, mining, manufacturing, and construction experienced moderate declines, while other sectors continued to expand. Employment in the service sector grew by 35 percent (115,000). To some extent, service sector growth may be explained by a growing tendency for firms to out-source supporting services outside of their core activities, creating an accounting shift to employment in service sub-sectors such as business services.

Table 21

Employment in Major Industrial Sectors, Harris County: 1940-2005

Year	Agric., Fishing & Forestry	Mining	Constr.	Manuf.	Trans., Comm.& Public Utilities	Whole-sale & Retail Trade	Finance, Insurance, and Real Estate	Services	Public Admin.
<u>Workers in sector</u>									
2005	40,422		179,256	184,716	142,084	262,319	123,129	741,727	40,146
2000	34,617		135,121	181,748	140,728	246,652	108,456	653,611	45,000
1990	14,608	47,237	114,099	186,780	112,038	317,282	102,124	448,262	39,399
1980	8,236	55,824	125,583	221,613	102,693	262,938	82,386	333,548	32,007
1970	5,666	20,246	63,348	143,039	56,714	162,540	41,956	229,883	24,617
1960	5,166	12,226	34,901	101,855	43,086	102,102	23,877	106,819	13,456
1950	4,813	7,122	33,145	72,647	35,663	75,494	14,713	68,881	8,866
1940	7,112	5,761	15,498	43,077	22,939	46,939	9,188	54,079	4,343
<u>Percent of workers in sector</u>									
2005	2.2		9.6	9.9	7.6	14.1	6.6	39.7	2.2
2000	2.2		8.7	11.8	9.1	15.9	7	42.2	2.9
1990	1.1	3.4	8.3	13.5	8.1	23	7.4	32.4	2.9
1980	0.7	4.6	10.3	18.1	8.4	21.5	6.7	27.2	2.6
1970	0.8	2.7	8.5	19.1	7.6	21.7	5.6	30.7	3.3
1960	1.2	2.8	7.9	23	9.7	23	5.4	24.1	3
1950	1.5	2.2	10.3	22.6	11.1	23.5	4.6	21.4	2.8
1940	3.4	2.8	7.4	20.6	11	22.5	4.4	25.9	2.1
<u>Percent growth from previous census</u>									
2005	16.8		32.3	1.6	1	6.4	13.5	13.5	-10.8
2000	These are not directly comparable due to the 1997 switch from SIC to NAICS								
1990	77.4	-15.4	-9.1	-15.7	9.1	20.7	24	34.4	23.1
1980	45.4	175.7	98.2	54.9	81.1	61.8	96.4	45.1	30
1970	9.7	65.6	81.5	40.4	31.6	59.2	75.7	115.2	82.9
1960	7.3	71.7	5.3	40.2	20.8	35.2	62.3	55.1	51.8
1950	-32.3	23.6	113.9	68.6	55.5	60.8	60.1	27.4	104.1

Source: USDOC, Census, 2005a.

In 1998, worker's earnings in Harris County totaled \$101 billion (Table 22). Earnings increased in the county by \$30 billion between 1990 and 1998, a 42 percent increase in an eight year period (constant 2000 dollars). By 2004, this number reached \$133 billion (2000 dollars), a 32 percent increase in the subsequent eight year period (USDOC, BEA, 2006).

In 2004, the largest shares of earnings were accounted for by services (29 percent), manufacturing (12 percent), mining (11 percent) and transportation and utilities (11 percent). Large manufacturing sub-sectors include petroleum and coal products (\$3.8 billion), chemicals (\$3.6 billion), and machinery (\$2.5 billion) (USDOC, BEA, 2006).

Growth in the 1990s was evenly distributed across industry sectors, in rough proportion to each sectors' overall earnings share. An exception is the mining sector, which accounted for 8.7 percent of earnings in 1990 but contributed 15.2 percent of earnings growth between 1990 and

1998. Industrial machinery manufacture accounted for 2.7 percent of 1990 earnings, and increased earnings by 5.6 percent. Transportation and public utilities accounted for 8.8 percent of 1990 earnings, and 14.7 percent of earnings growth. The air transportation sub-sector was a significant contributor of earnings growth.

The service sector's share of growth was almost identical to its 1990 earnings share. Within the service sector, the growth of business services alone accounted for 10 percent of earnings growth for the county. Legal and health services each grew at a much slower rate than their 1990 earnings share. Growth was also relatively modest in government employment. The following table characterizes earnings by sector for the 1990s.

Table 22

**Earnings in Major Industry Sectors and Selected Sub-Sectors,
Harris County: 1990-1998**

Industry	Earnings (Constant 2000 \$1000s)		% Share of 1998 Earnings	\$ Change 1990-1998	% Share of Change 90-98
	1990	1998			
Earnings	71,952,448	101,884,336	100.0	29,931,888	100.0
Farm earnings	22,281	36,419	0.0	14,139	0.1
Ag. services, forestry, fish.	232,619	338,097	0.3	105,478	0.4
Fishing	5,366	NA	NA	NA	NA
Mining	6,373,336	10,925,626	10.7	4,552,291	15.2
Oil and gas extraction	6,307,038	10,865,074	10.7	4,558,037	15.2
Construction	5,809,187	6,721,465	6.6	912,278	3.1
Special trade contractors	2,480,624	3,270,481	3.2	789,857	2.6
Manufacturing	8,810,010	12,705,788	12.5	3,895,778	13.0
Fabricated metal products	1,004,118	1,572,006	1.5	567,888	1.9
Industrial mach. & equip.	1,967,062	3,628,174	3.6	1,661,112	5.6
Food and kindred	510,811	554,293	0.5	43,483	0.2
Chemicals and allied	2,266,678	3,059,624	3.0	792,946	2.7
Petroleum and coal	722,952	806,117	0.8	83,165	0.3
Transportation and public utilities	6,347,495	10,754,161	10.6	4,406,667	14.7
Trucking and warehousing	850,567	1,161,749	1.1	311,182	1.0
Water transportation	421,815	584,535	0.6	162,720	0.5
Transportation by air	884,584	1,647,681	1.6	763,097	2.6
Wholesale trade	6,040,197	7,491,253	7.4	1,451,056	4.9
Retail trade	5,513,968	7,605,169	7.5	2,091,201	7.0
Eating and drinking places	1,283,496	1,848,357	1.8	564,861	1.9
Finance, insurance, and real estate	4,793,801	7,180,781	7.0	2,386,981	8.0
Services	20,754,400	29,247,792	28.7	8,493,392	28.4
Business services	4,339,920	7,434,718	7.3	3,094,798	10.3
Health services	5,288,506	6,660,729	6.5	1,372,223	4.6
Legal services	2,803,887	3,098,331	3.0	294,444	1.0
Engineer. & mngmt. serv.	3,875,289	5,968,788	5.9	2,093,499	7.0
Government	7,255,157	8,877,786	8.7	1,622,630	5.4

Source: USDOC, BEA, 2003.

Growth in the early 21st century also shows a relatively even distribution across industry sectors (Table 23), in rough proportion to each sectors' overall earnings share.⁵ The mining sector continues to have particularly striking growth, especially in oil and gas extraction. This sector accounted for 11 percent of earnings in 2004 and for 36 percent of earnings growth between 2001 and 2004, with 31 percent of the 36 accounted for by growth in oil and gas extraction. Government and government enterprises accounted for 9 percent of 2001 earnings, but 23 percent of growth. Health care and social assistance accounted for 6 percent of 2001 earnings, and 14 percent of earnings growth (USDOC, BEA, 2006).

4.5.3. House Prices

Median house prices were \$92,300 for Baytown (2005), \$131,400 for Clear Lakes (2000), \$90,900 for Deer Park (2000) and \$112,800 for Houston (2005) (USDOC, Census, 2005a).

4.5.4. Military Installations

None.

4.5.5. Marine-Based Activities

Harris County is home to the Port of Houston, ranked first in the United States in foreign waterborne tonnage and second in U.S. total tonnage. It is tenth in world total tonnage. In 2005, about 200 million tons of cargo passed through the port, and 75,057 vessels visited the port that year. The port consists of 25 miles of diversified public and private facilities. It is an important contributor to Harris County's economy, generating 287,000 direct and indirect jobs. The port generates nearly 11 billion dollars in economic impacts. In 2005, the Port Authority completed improvements to deepen the channel from 40 to 45 feet and widen it from 400 to 530 feet. It is also home to a \$15 billion petrochemical complex, the largest in the nation and second largest worldwide (Port of Houston Authority, 2006).

4.5.6. Tourism

Harris County offers extensive opportunities for recreation. The county park system is divided into four precincts for management purposes. Precinct one is responsible for the development and maintenance of 30 parks and hiking and biking trails. Precinct two maintains 35 parks and over 14 miles of walking trails. Precinct three operates 37 parks and over 12,000 acres of land for recreational purposes. Precinct four manages 22 parks for the county (Harris County Park System, 2006).

Harris County offers professional baseball, basketball, and rodeo events for recreational outlets. Several performing arts centers offer cultural activities for residents. Museums, a planetarium, a zoo, historic sites, and the Johnson Space Center are recreational activities available to residents and visitors to Harris County (TSHA, 2003).

⁵ Table 5 is based on SIC industry classifications while Table 6 is based on NAICS classifications. Due to changes between SIC and NAICS, it is not appropriate to show data as if they were a continuous time series.

Table 23**Earnings in Major Industry Sectors and Selected Sub-Sectors, Harris County: 2001-2004**

Industry	2001	2004	% Share of 2004	\$ Change	% Share of Change
Earnings by place of work	\$134,482,975	\$145,637,154	100%	\$11,154,179	100%
Farm earnings	\$29,538	\$30,210	0%	\$672	0%
Forestry, fishing, related activities, and other	\$64,884	\$59,074	0%	-\$5,810	0%
Mining	\$12,329,401	\$16,313,493	11%	\$3,984,092	36%
Oil and gas extraction	\$9,900,798	\$13,323,437	9%	\$3,422,639	31%
Utilities	\$6,167,605	\$7,064,711	5%	\$897,106	8%
Construction	\$9,482,321	\$10,135,105	7%	\$652,784	6%
Manufacturing	\$17,584,384	\$17,204,927	12%	-\$379,457	-3%
Petroleum and coal products manufacturing	\$4,175,774	\$3,833,731	3%	-\$342,043	-3%
Chemical manufacturing	\$3,402,611	\$3,576,707	2%	\$174,096	2%
Machinery manufacturing	\$2,279,630	\$2,513,365	2%	\$233,735	2%
Wholesale trade	\$8,278,163	\$9,106,441	6%	\$828,278	7%
Retail trade	\$6,689,477	\$6,820,269	5%	\$130,792	1%
Transportation and warehousing	\$10,576,390	\$8,825,045	6%	-\$1,751,345	-16%
Pipeline transportation	\$5,167,641	\$2,150,834	1%	-\$3,016,807	-27%
Support activities for transportation	\$1,271,396	\$2,042,020	1%	\$770,624	7%
Air transportation	\$1,781,765	\$1,957,806	1%	\$176,041	2%
Information	\$3,391,516	\$2,705,668	2%	-\$685,848	-6%
Finance and insurance	\$8,348,363	\$8,086,811	6%	-\$261,552	-2%
Real estate and rental and leasing	\$3,493,645	\$4,017,285	3%	\$523,640	5%
Professional and technical services	\$15,910,137	\$16,674,144	11%	\$764,007	7%
Management of companies and enterprises	\$995,137	\$1,476,440	1%	\$481,303	4%
Educational services	\$1,369,364	\$1,589,873	1%	\$220,509	2%
Health care and social assistance	\$7,435,259	\$9,009,160	6%	\$1,573,901	14%
Arts, entertainment, and recreation	\$724,620	\$925,773	1%	\$201,153	2%
Other services, except public administration	\$2,978,573	\$3,308,240	2%	\$329,667	3%
Government and government enterprises	\$10,649,999	\$13,205,236	9%	\$2,555,237	23%

Source: USDOC, BEA, 2006.

*All major categories are shown. The top three subcategories in manufacturing and transportation and warehousing are shown, as well as the top subcategory under mining.

4.6. Local Government

4.6.1. Governmental Structure

The Commissioners Court is the main governing body of Harris County, like all Texas counties, and it follows the Local Government Code. This court consists of a County Judge presiding over four precincts, each individually served by a County Commissioner. Law enforcement agencies in Harris County are numerous. The constable offices for each of the precincts are responsible for civil process issued by county courts, criminal warrants issued through justice of the peace courts, and patrol personnel (Harris County, Texas, 2003). The Harris County Sheriff's Department is divided into nine bureaus (Detective, Detention, Executive, Human Resources, Patrol, Patrol Support Services, Public Services, Support Services, and Field Operations Support) and tasked with prevention of criminal actions and arrest of offenders throughout the county, although focusing on unincorporated areas. Incorporated areas, cities and towns, maintain their own individual police departments (Harris County Sheriff's Office, 2006). Harris County has 68 fire companies that provide services for the county, of which 26 are located in Houston (Texas Commission on Fire Protection, 2006).

4.6.2. Revenues and Taxation

In 2005, total sales subject to sales tax were \$49 billion (Strayhorn, 2006). The county tax rate is \$.61 per \$100. The City Tax Rate in Baytown is \$.73 per \$100, the Independent School District Tax Rate is \$1.58 per \$100, and the Special District Rate is \$.18 per \$100. The city tax rate in Clear Lake is \$.66 per \$100 and the Independent School District Tax Rate is \$1.6 per \$100. The City Tax Rate in Clear Lake is \$.68 per \$100 and the Independent School District Tax Rate is \$1.53 per \$100. The City Tax Rate in Houston is \$.66 per \$100, the Independent School District Rate is \$.62 per \$100, the Special District Rate for the Houston Independent School District is \$1.4 per \$100, and the Special District Rate for the Community College is \$.06 per \$100.

4.6.3. Voter Registration

Harris County has 935 voting precincts and 1,429,683 non-suspense registered voters. The number of registered voters in Harris County has grown steadily (nearly 34 percent since 1988) over the last decade and a half with only a slight drop in the early 1990s and in 2006 (Table 24). Voter turnout has vacillated between Presidential and non-Presidential election years, although there is an overall decline in the last 15 years. Since 1988, voter turnouts for Presidential election years averaged 60 percent, with a high of over 71 percent in 1992 and a low of just less than 52 percent in 2000. Non-Presidential election years averaged 40 percent, with a high of just more than 49 percent in 1994 and a low of 30 percent in 2006 (Texas Secretary of State, 2006).

Table 24

Voter Registration and Voting: Harris County, 1988-2006

Year	Voter Registration	Voted	Percent Voted
1988	1,260,884	814,160	64.57
1990	1,175,883	553,841	47.10
1992	1,315,010	942,636	71.68
1994	1,308,883	641,897	49.04
1996	1,592,569	855,893	53.74
1998	1,755,809	536,443	30.55
2000	1,886,581	974,822	51.67
2002	1,902,561	648,077	34.06
2004	1,937,072	1,067,968	55.13
2006	1,918,652	572,031	29.81

Source: Texas Secretary of State, 2006.

4.7. Social Context

4.7.1. Education

In the 2003-04 school year, 67 percent of Harris County's educational expenditures on average went towards traditional education. Per pupil total operating expenditures were \$6,769 and per pupil instructional expenditures were \$4,029. In 2003-04, the average student/teacher ratio in the district was 16.5, average attendance was 93.5 percent, and the average dropout rate was 0.87. The average salary for Harris County teachers was \$35,138 (Texas Education Agency, 2004).

On student achievement indicators, Harris County placed near the middle of the distribution of Texas counties. In Harris County, 80.7 percent of 3rd-grade students, 86.7 percent of 5th-grade students, and 61.9 percent of 7th-grade students passed the Texas Assessment of Knowledge Skills (TAKS) test in math. Harris County ranked 154th, on average, of 252 counties reporting on this indicator. On the TAKS reading test, 92.9 percent of Harris County 3rd graders, 83.5 percent of 5th graders, and 80.9 percent of 7th graders passed the reading test. Harris County ranked 171st, on average, of 252 reporting counties on this indicator (Kids Count, 2006). The overall passing rate of all tests taken was 65.9. The average ACT score in the county was 19.6. The average SAT score was 926 (Texas Education Agency, 2004).

In 2005, 71 percent of Harris County adults were high school graduates and 27 percent were college graduates (Table 25). The percentage of Harris County adults with college degrees has held constant from 1990 though 2005 at about 27 percent. However, while this was 1.25 times the state norm in 1990, it is 1.09 times the state norm in 2005.

Table 25**Educational Attainment of Adults (Age 25+), Harris County: 1940-2005**

Year	Educational Attainment of Adults (%)					Ratio to State	
	0-8 years	Some High School	High School Diploma	Some College, No Degree	BA/BS or more	High School Diploma or More	BA/BS or more
2005	12	11	24	20	27	0.97	1.09
2000	12	13	22	21	27	0.99	1.16
1990	12	14	24	22	27	1.04	1.25
1980	15	15	29	19	23	1.13	1.37
1970	24	23	25	13	15	1.11	1.35
1960	33	21	23	12	10	1.14	1.31
1950	40	23	19	10	8	1.22	1.33
1940	47	19	19	8	6	1.35	1.46

Source: USDOC, Census, 2005a and 2005c.

4.7.2. Health and Welfare

Of the 66,707 total live births in 2003, 7.9 percent were low birth weight; this mirrors the state figure of 7.9 percent. The percentages vary by ethnicity: whites (7.3 percent), blacks (13.6 percent), and Hispanics (7.0 percent) (Texas Dept. of State Health Services, 2006). Harris County ranked 146th of 254 counties where a rank of 1 indicates the lowest percentage of low-weight births (Kids Count, 2006). The percentage of cases with adequate prenatal care was 73.7 percent. Corresponding race-specific figures were 83.5 percent for whites, 74.2 percent for blacks, and 67.5 percent for Hispanics. Harris County ranked 154th of 254 counties based on the percentage of cases with adequate prenatal care. The infant mortality rate was 6.5 per 1,000 live births, which mirrored closely the state rate of 6.6 (Kids Count, 2006). The fertility rate in 2002 was 78.6 per 1,000 women, which exceeds the state figure of 76.1. The death rate in 2003 was 861.4 per 100,000 persons. The corresponding race-specific death rates are 874.2 for whites, 1,167.3 for blacks, and 631 for Hispanics (Texas Dept. of State Health Services, 2006).

The ratio of the population per direct care physician was 523 in 2002, compared to the statewide figure of 661. The ratio of the population per dentist was 2,166, which stands below the state figure of 2,820. The county had 54 acute care hospitals (14,487 licensed beds and 11,362 staffed beds). Seventy-three nursing homes provided 9,162 licensed beds (Texas Dept. of State Health Services, 2006).

In 2003, the teen violent death rate in Harris County was 45.6 per 100,000, down from 60.5 in 1997; it ranked 133 out of 245 counties (where 1 indicates the lowest incidence). The percentage of teens that were neither in school nor in the labor force in Harris County in 2000 was 8.4 percent, which exceeds the state figure of 7.1 percent. In 2002, 19.9 percent of children in the county lived in poverty, which nearly equals the state percentage of 21.3. On this indicator, Harris County rates 87th of 254 counties (where 1 reflects the lowest rate of poverty). As of 2003, 3.9 percent of children in Harris County were part of families who received temporary assistance

to needy families (TANF), which is slightly below the 2003 state percentage of 4.5. On this indicator, Harris County rated 141st of 122 reporting counties (where 1 reflects the highest rate of poverty). On this indicator, Harris County had a rating of 32 of 68 reporting counties (where 1 indicates the highest rate of children in foster care). The rate of cases of child abuse or neglect in 2004 was 5.8 (per 1,000), which stands below the state percentage (8.2). On this indicator, Harris County rated 50th of 254 counties (where 1 reflects the lowest rate of confirmed cases of abuse or neglect) (Kids Count, 2006).

4.7.3. Recreation

Harris County is home to the Houston Astrodome, Six Flags Astroworld, and the Space Center Houston. Lake Houston State Park, Sheldon Lake State Park, Hermann Park, and Armand Bayou Nature Center are frequently visited areas for outdoor recreation. Historic sites and museums of interest are the San Jacinto State Historic Park, Museum of Printing History, and the Houston Museum of Fine Art, to name a few. The Houston Public Library system is one of the most extensive in our country and prides itself for housing a premiere collection of genealogical materials at the Clayton Center for Genealogical Research. Harris County is also one of only a very few U.S. counties with resident companies in opera, theater, symphony, and ballet in the cultural center of Houston. Of the festivals held within the county, the most noted one is the Tyler County Dogwood Festival (TSHA, 2001).

4.7.4. Religion

According to the American Religion Data Archive (ARDA, 2006a), 50.8 percent of the population claimed to be religious adherents in Harris County in 2000. Of these, some 40.7 were evangelical protestant, 16.2 were mainline protestant, and 36.1 percent were Catholic, and the remaining 7 percent were other denominations and religions.

4.8. OCS-Related Infrastructure

Harris County ranks highest in terms of concentration of OCS-related infrastructure with:

- 10 refineries
- 27 petrochemical plants
- 95 terminals
- 1 port
- 6 shipyards
- 15 ship repair facilities
- 13 supply bases
- 3 platform fabricating facilities
- 4 pipe coating facilities
- 3 natural gas processing facilities
- 2 natural gas storage facilities
- 59 heliports/helipads

BOEM’s ranking system incorporates employment, pollutant release, and surrounding population data. Figure 7 shows the ranking of 2000 Census tracts with OCS-related infrastructure while Figure 8 shows the ranking of Census block groups with OCS-related infrastructure.⁶ Harris County has one tract and several block groups with the highest concentration of OCS-related infrastructure. Figure 9 is an overlay of the OCS-related facilities with the population educational level. The darkest color corresponds to block groups where half or more of the population hold Bachelor’s degrees. There is a clustering of this group to the west of the Houston ship channel where the concentration of refineries and petrochemical plants is evident.⁷

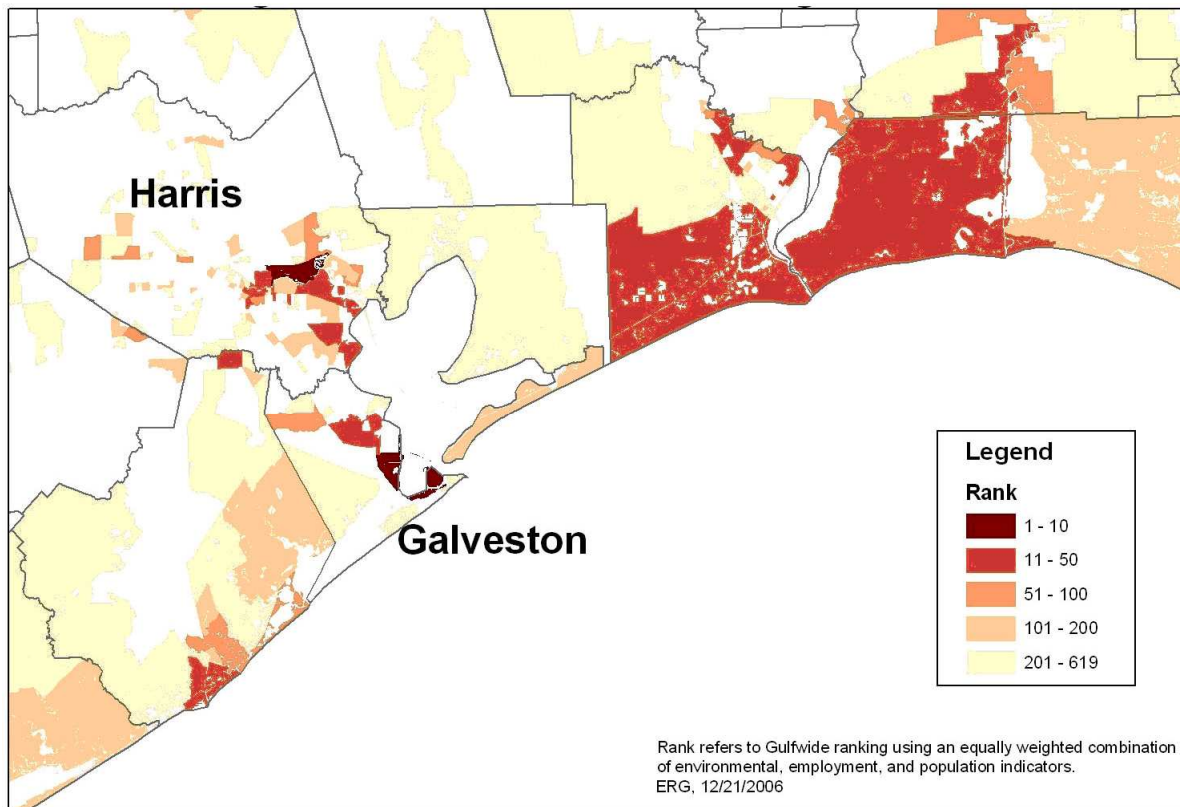


Figure 7. Harris County, Texas. Concentration of OCS-related infrastructure–census tract.

⁶Census tracts contain from 1,500 to 8,000 persons. Census tracts are further subdivided into block groups containing from 600 to 3,000 people.

⁷ The grey areas are blocks with fewer than 100 people.

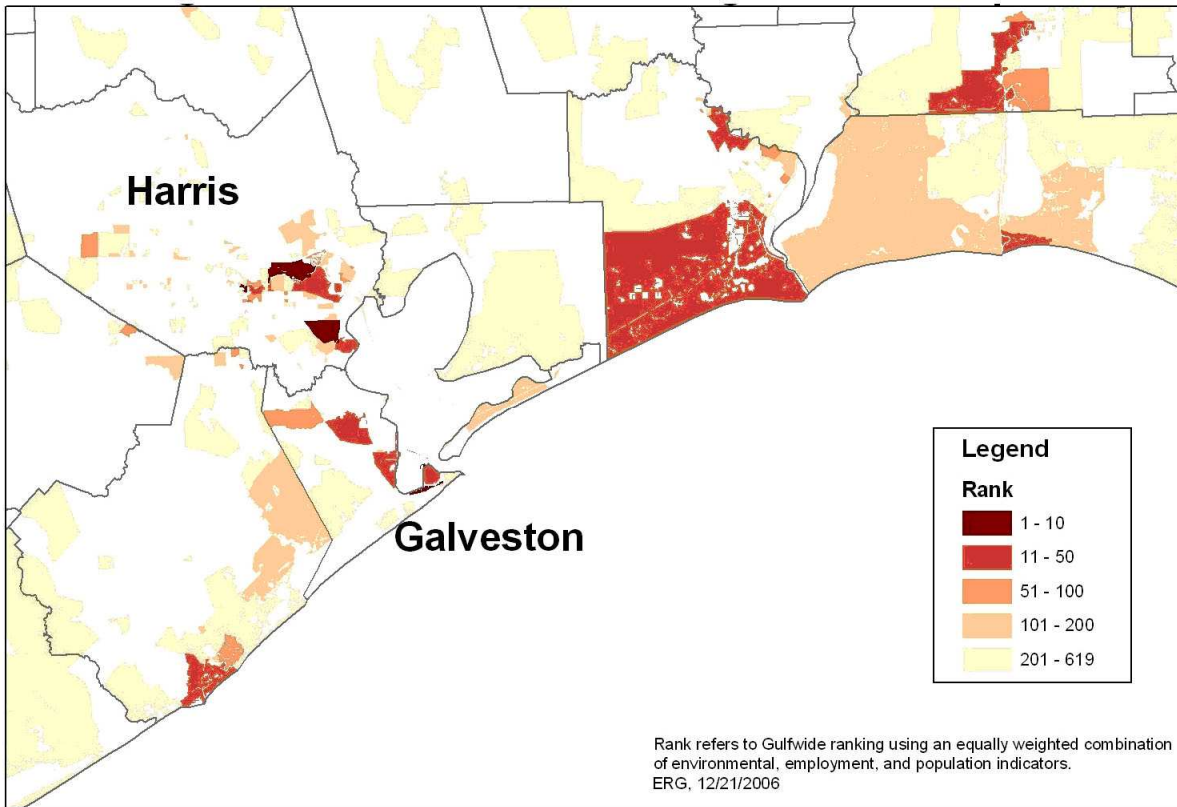


Figure 8. Harris County, Texas. Concentration of OCS-related infrastructure-census block group.

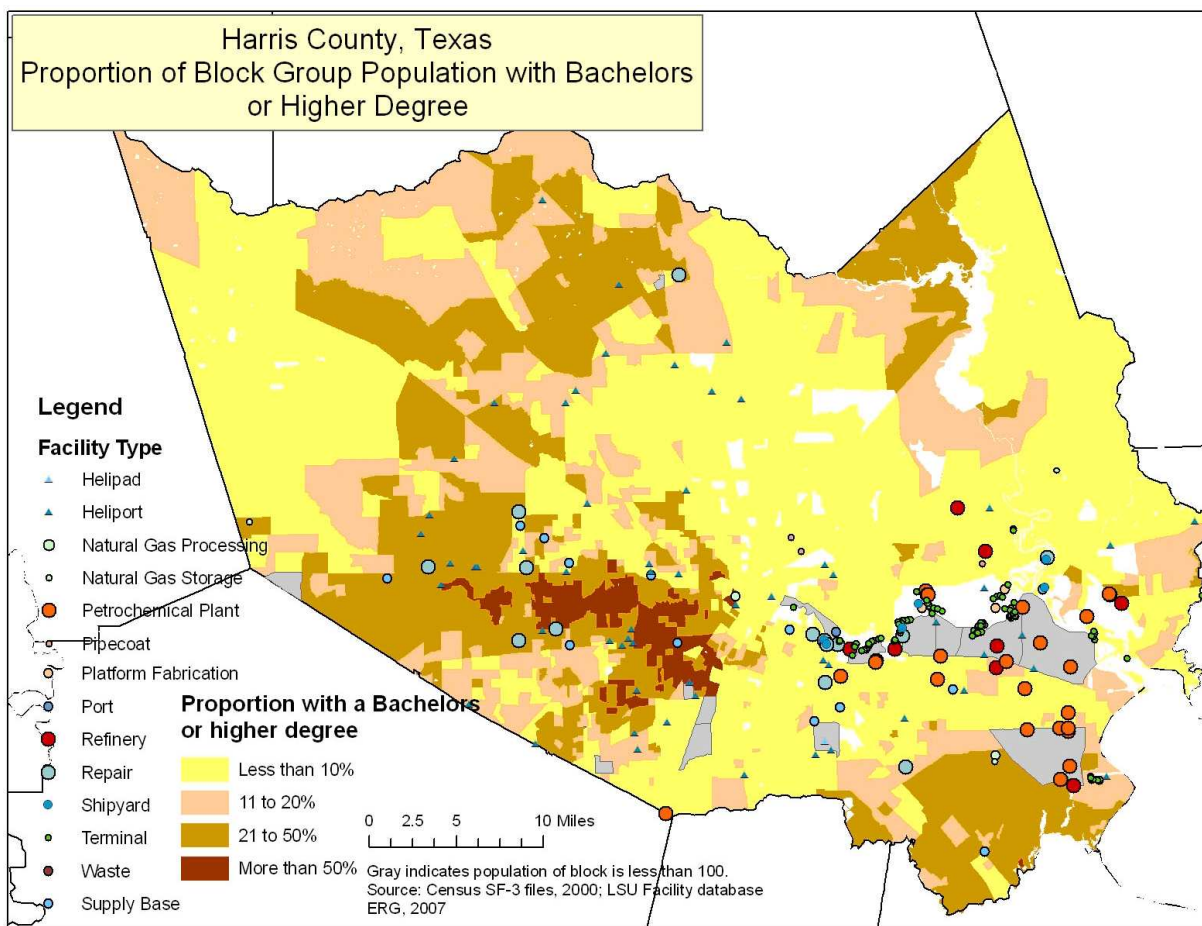


Figure 9. Harris County, Texas. Overlay of OCS-related infrastructure and educational level.

Figure 10 overlays the percentage of black population within block groups over the OCS-related facilities. There are clusters where 75 percent or more of the population is black. These clusters, however, appear to run north-south while the OCS-related facilities run east-west. That is, there appears to be no visual correlation between the percentage of black population with the OCS-infrastructure.⁸ A different situation is seen with the Hispanic population (Figure 11). In the eastern part of the figure, two petrochemical plants, one refinery, and a few small OCS-related facilities appear to be clustered in an area where more than 75 percent of the population is Hispanic. A similar clustering of OCS-related facilities and Hispanic population can be seen at the western end of the Houston ship channel.

⁸ The preliminary focus of this study is on methodology development to characterize areas of OCS-related infrastructure concentration and integrating this with socioeconomic data from Census. As such, it forms a starting point for detailed environmental justice studies. To facilitate future work, ERG delivered datasets ranking Census blocks and tracts by OCS infrastructure concentration merged with Census socioeconomic data. For this initial study, we present the data visually.

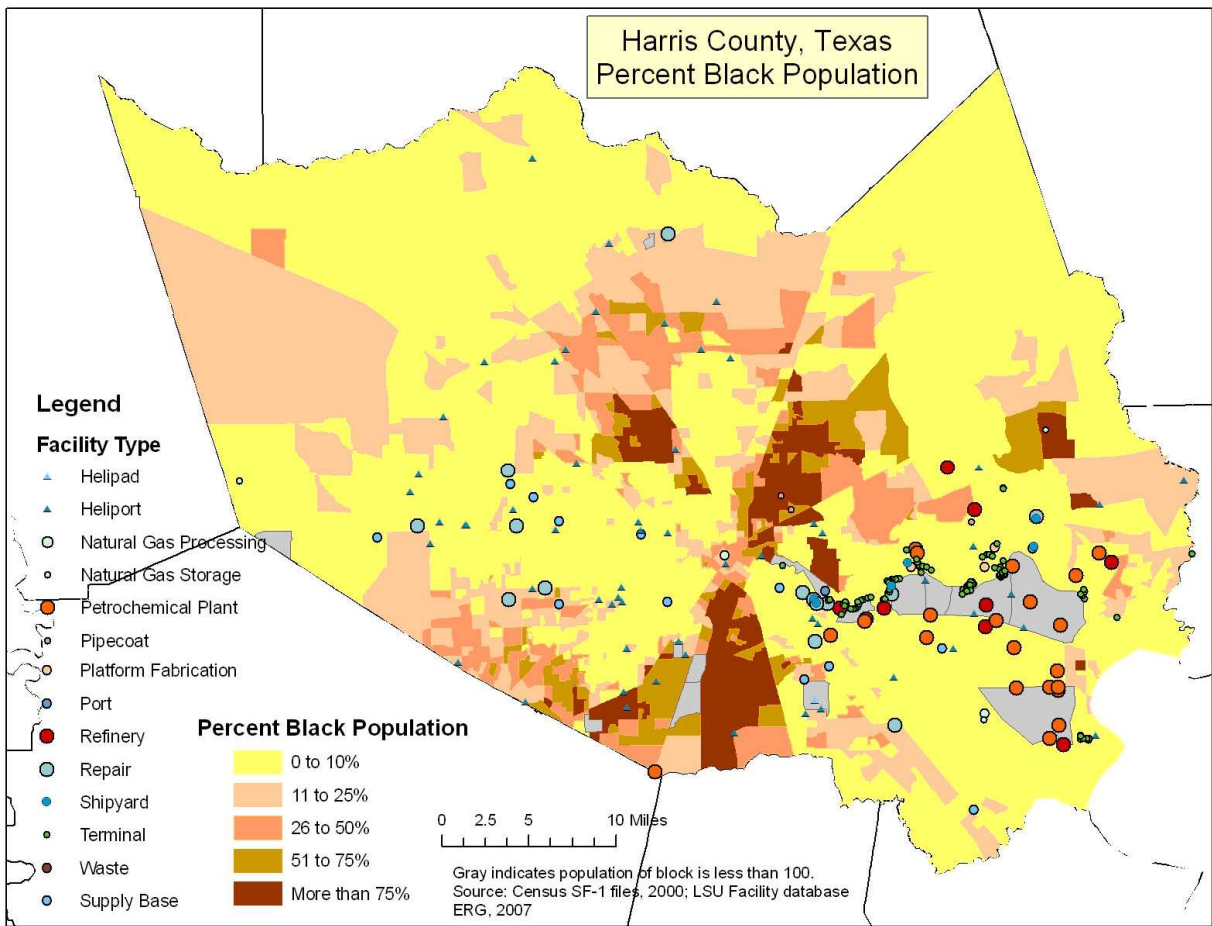


Figure 10. Harris County, Texas. Overlay of OCS-related infrastructure and percentage of black population.

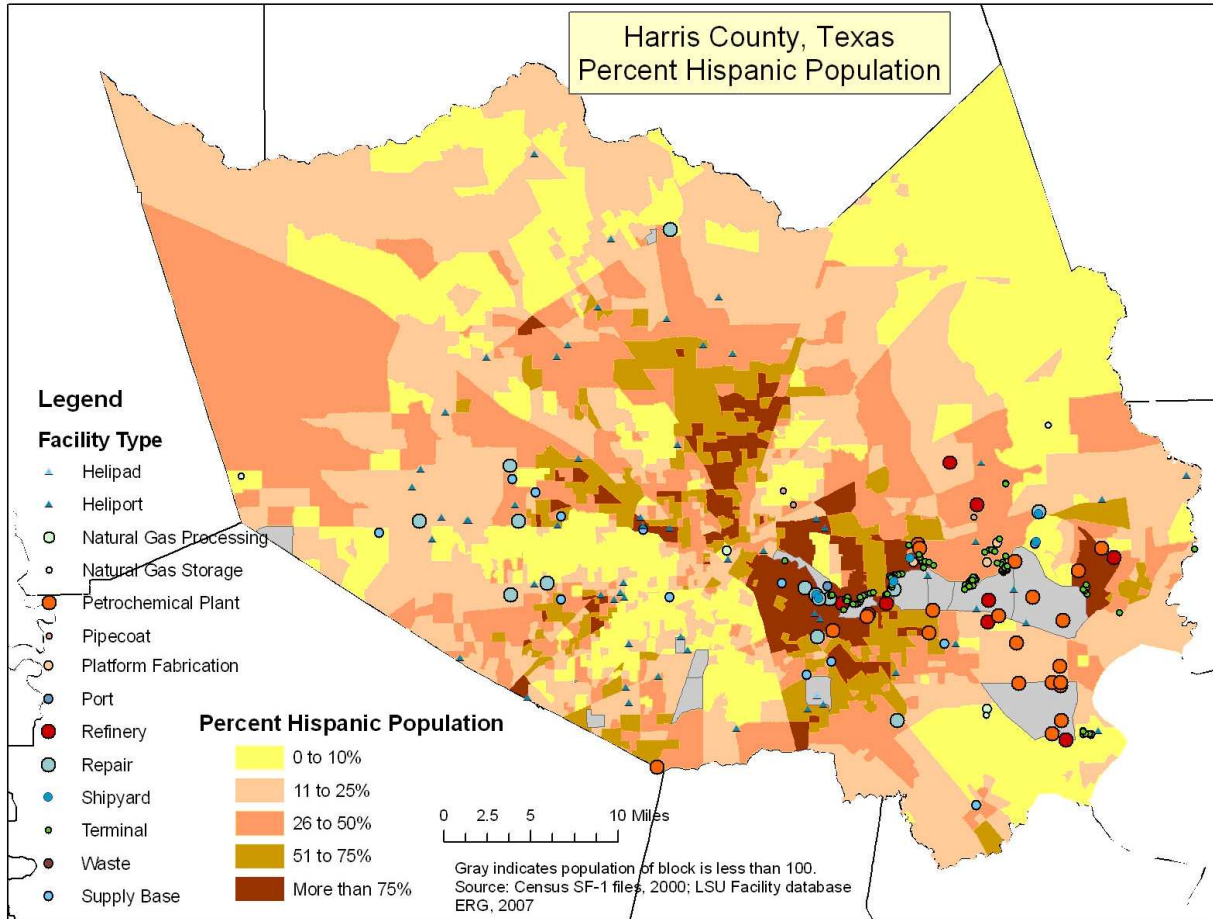


Figure 11. Harris County, Texas. Overlay of OCS-related infrastructure and percentage of Hispanic population.

However, the locations of OCS-related facilities have no apparent visual correlation with the percent of the population with incomes below the poverty level (Figure 12). Block groups where more than half the population has income below the poverty level are scattered throughout the county.

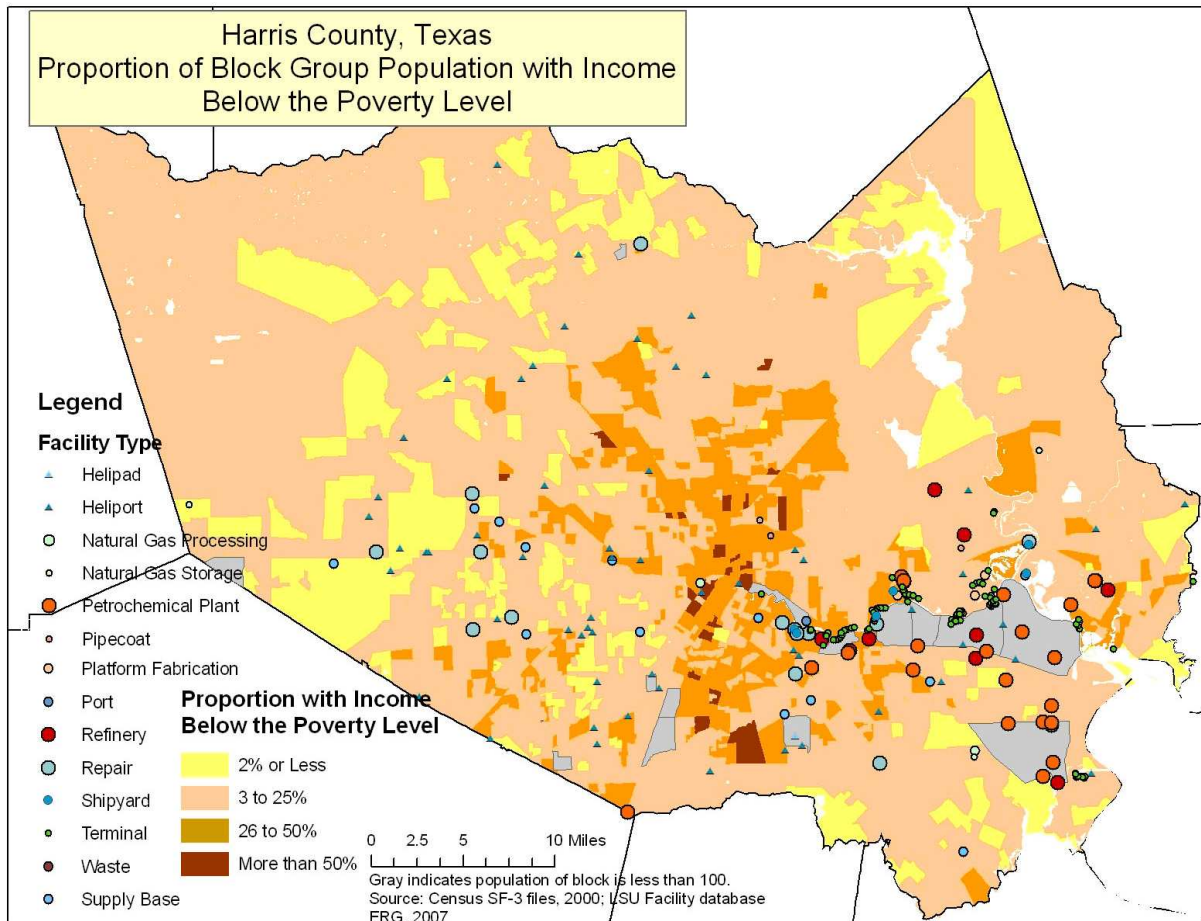


Figure 12. Harris County, Texas. Overlay of OCS-related infrastructure and percentage of block group population below the poverty level.

4.9. Impacts from Hurricanes Rita and Katrina

Hurricane Rita was an intense storm that blossomed from a tropical storm to Category 5 strength within 36 hours in the Gulf of Mexico in September 2005. With a 30-mile wide eye, wind speeds reaching 165 knots, and the fourth-lowest central pressure on record in the Atlantic basin, the approach of Hurricane Rita led to evacuation orders in Harris and other Texas counties issued on September 21 and 22. This resulted in approximately 2.5 million people leaving the area.

In Hurricane Rita's potential path lay Harris County with the OCS-related infrastructure described in the previous section. Many of the facilities, e.g., refineries and petrochemical plants, shut down in advance of the approaching storm as a precautionary measure (USDOE, EIA, 2005a; Knabb et al., 2006a; Mack, 2005).

Hurricane Rita, however, abruptly weakened on September 23, changed direction, and made landfall as a Category 3 storm in southwestern Louisiana just east of Sabine Pass. Rita continued to weaken and became a tropical storm about 35 miles north of Beaumont, Texas on September 24 (Knabb et al., 2006a). By September 25, tens of thousands of evacuees began returning to

Houston and other parts of Harris County (Applebome et al., 2005). On September 28, the Energy Information Administration reported that six of 16 Gulf Coast refineries had already restarted and that two more were attempting to restart (USDOE, EIA, 2005b). Harris County officials estimated that Hurricane Rita caused \$111 million in damages, mostly through the loss of perishable inventories. Had Hurricane Rita stayed on track, the officials anticipated billions of dollars in damages (Harris County Tax Office, 2005).

Hurricane Rita was the second Category 5 storm in the Gulf of Mexico to make landfall on the Gulf Coast as a Category 3 storm within a month. The first was Hurricane Katrina which made landfall in Florida on August 25, regained strength as it passed over the warm waters of the Gulf of Mexico, and slammed into the Louisiana coast on August 29. Katrina's path, then, did not include Harris County. But for Harris County, Hurricane Katrina appears to have caused more disruption than Hurricane Rita. People leaving the devastation caused by Katrina in Louisiana fled to Texas and to Harris County and Houston, in particular. Houston readied the Astrodome Stadium and Harris County took in about 200,000 evacuees (Wieberg and Frank, 2005).

Unlike the Hurricane Rita evacuations, where people could return to their homes and jobs soon after the storm passed, substantial numbers of Hurricane Katrina evacuees still remain in Harris County in late 2006. Three-quarters of 765 Houston-area residents surveyed in February 2006 believed that aiding the refugees put "considerable strain" on the community. Approximately 6,000 evacuees now attend Houston area schools and the Harris County Hospital District treats about 800 extra patients a month—down from a peak of 15,000 in two weeks at the Astrodome. While the district does not consider the number of evacuees to be overwhelming or to cause delay in care for Houston residents, the cost of treating the refugees is \$11.6 million and the district has only been reimbursed for \$1.6 million by FEMA and Medicaid (FoxNews.com, 2006).

Local Area Unemployment Statistics for the Houston Metropolitan Area indicate an annual unemployment rate of 6.2 percent for 2004 (Figure 13). Unemployment declined to 5.3 percent in August 2005, increased to 5.8 percent in September 2005, fell back to 5.4 percent in October 2006, and finished the year with an annual unemployment rate of 5.5 percent. In other words, there is a small blip in unemployment rate for the month of September. The blip, however, is not a long-term effect. The unemployment rate for the Houston Metropolitan Area continues to decline. The unemployment rate for October 2006 is 4.5 percent (USDOL, BLS, 2006a).

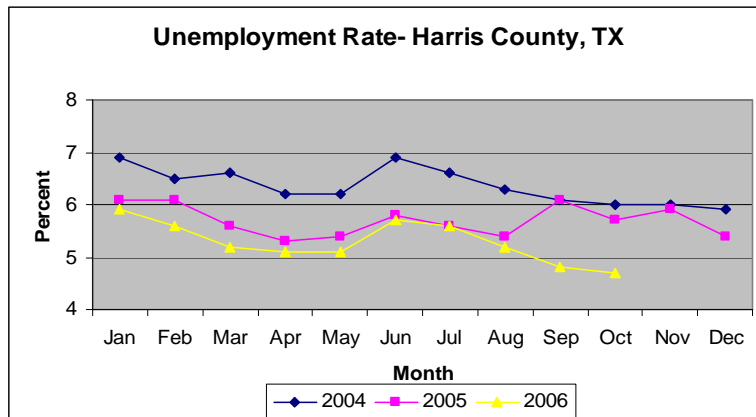


Figure 13. Harris County, Texas unemployment rate.

4.10. Issues of Concern

Harris County is the third largest county in the nation and home to the country’s fourth largest city. Half of its 3.6 million residents live in the 800-square-mile Houston Metropolitan Area. The absorption of Hurricane Katrina evacuees adds to the normal difficulties in handling growth in terms of housing, health care, pollution, and employment. For example, although Houston is home to the largest medical center in the world, the county’s uninsured population exceeds the national average by 8 percent, as 26.2% of Harris County residents are uninsured.

5. JEFFERSON COUNTY, TEXAS

5.1. Introduction

Jefferson County, named after Thomas Jefferson, is the 19th most populous county in the State of Texas. In 2005, the population was estimated at 247,571, down slightly from the 2000 estimate of 252,051 (USDOC, Census, 2005b). The county is part of the Beaumont-Port Arthur Metropolitan Area and is bordered on the northeast by Orange County, on the southwest by Chambers County, and on the northwest by Liberty and Hardin Counties. Cameron Parish, Louisiana and its broad bayou region lies to the east. The Gulf of Mexico forms the southern border.

Jefferson County is a low-lying area with a maximum elevation of 45 feet above sea level. Estuarine systems, lakes, rivers, and streams comprise 208 square miles of the county's total 1,112 square mile area. Sabine Lake, situated east of Port Arthur, is an important transportation route into the Gulf of Mexico via the narrow Sabine Pass at the southeast end of the county (TSHA, 2003).

Beaumont, incorporated in 1839, is the county seat and with 111,799 residents, is the largest city in the county (USDOC, Census, 2005b). The geographic coordinates for the county seat are 30°05'N and 94°06'W. With the exception of Metropolitan Houston, which is approximately 65 miles southwest, the majority of land in all northerly directions is quite rural and largely unpopulated (TSHA, 2003).

With access to the Gulf of Mexico, the economic history of Jefferson is dependent on its topography and natural resources. The Port Arthur ship canal, on the west shore of Sabine Lake, and Sabine Pass provide deepwater ports at Beaumont, Port Arthur, Nederland, and Port Neches, and ready access to the Gulf. Deepwater transportation, petrochemical industries, and offshore oil and gas are the county's principal industries (TSHA, 2001).

The Jefferson County climate is subtropical with an average high temperature in July of 92 degrees and an average low in January of 42 degrees. The average annual rainfall is 57.2 inches. The county has approximately 32-miles of coastline along the Gulf of Mexico, most of which is within the McFaddin National Wildlife Refuge. Given the marshy character of the coastline, however, most of the refuge is very difficult to access, even by boat (TSHA, 2003). State Route 87 follows a path from Sabine Pass along the coast, and then turns northwest and inland. The road follows a transportation corridor that dates back to the 1860s, yet coastal erosion in past years led to substantial portions of the road being closed (TexasFreeway.com, 2006). The vulnerability of the coastal region to erosion and storm surge led to evacuations during Hurricane Rita in 2005.

The southern portion of Jefferson is typically very marshy with consistently flat, low, and wet terrain along the Gulf of Mexico. Where there is sufficient soil and grass, the terrain can be good for cattle. Soils are typically sandy in the east, and ocean sediments comprise the immediate coast. The middle third of the county is coastal prairie and especially favorable for grazing and rice cultivation. The northernmost portions of the county, northwest of Beaumont especially,

tend to be heavily forested. Various hardwoods and southern yellow pine are predominant in this region. Loamy soils typically overlay reddish clay or loamy subsoil. Less than ten percent of the land in Jefferson County is classified as prime farmland (TSHA, 2001).

5.2. Built Environment

5.2.1. Human Geography/Population Centers

Cities and towns in Jefferson County include (2005 data) Beaumont (111,799), Bevil Oaks (1,276), China (1,079), Groves (15,006), Nederland (16,751), Nome (503), Port Arthur (56,684), and Port Neches (13,131) (USDOC, Census, 2005b).

Although they are geographically distinct, Sabine Pass and Sabine are within the city limits of Port Arthur, while the towns of Port Neches, Nederlands, and Grove are fairly contiguous with Port Arthur, but are considered distinct geopolitical entities. Sabine and Sabine Pass are quite small but are unique in that they have small but robust shrimp fleets employing a strong Vietnamese contingency (TSHA, 2003).

5.2.2. Transportation and Communication

The Atchison, Topeka and Santa Fe, Kansas City Southern, Missouri Pacific, and Southern Pacific serve as the county's rail system, and the Neches River provides water transport and an important shipping point (TSHA, 2001).

Interstate 10 and U.S. Highways 69, 96, and 287 provide routes through the county, as do State Routes 347, 365, 366 (TSHA, 2001). A series of small, unpaved, or partially paved roads network through those portions of the county that are sufficiently dry enough to support road bed. There are a total of 392 road miles in Jefferson County (Texas Association of Counties, 2004b).

Physical Infrastructure. Water to the region is provided by the Neches River, three wells, Lake Steinhagen, and Sam Rayburn Reservoir (TSHA, 2001). Entergy provides electricity to Beaumont, Port Arthur, and Nederland. Entex provides natural gas to Beaumont, while Sothern Union gas serves Port Arthur and Nederland. Phone service is provided by Southwestern Bell (Jefferson County, Texas, 2007).

Among the libraries in the county is the Marion and Ed Hughes Public Library in Nederland, which maintains 37,000 volumes. Beaumont has an extensive library system, and Lamar University's library in nearby Orange offers over one million volumes (TSHA, 2001).

The *Beaumont Enterprise* is the main daily paper serving the county. The *Beaumont Journal* and *The Examiner* are weeklies. Each of the smaller cities also has small news operations. Several radio stations broadcast from the county including: KLVI 560, KVLU 91.3, KAYD 97.5, KIKR 1450, KYKR 95.1, KQXY 94.1, KTXB 89.7, KTCX 102.5, and KIOC 106.1.

5.2.3. Interaction between Built and Physical Environments

The Beaumont area was settled, in large part, due to the easy trade and transportation route available on the Neches River. However, the discovery of oil in 1901 at Spindletop led to its rapid growth. Settlement patterns followed naturally on the heels of the discovery, and residence tends to be near the oil fields and routes of oil transportation.

In 2006, 18 water systems served 263,097 individuals year-round in Jefferson County. Ten of these, serving 93,866 people, have had health-based violations in the past 10 years (USEPA, 2006a). In 2004, 23,366,167 lbs. of hazardous waste was generated in Jefferson County and 514,755,299 lbs. were managed there. At 50 percent of the hazardous waste generated in Jefferson County, underground releases constitute the largest. Air releases are the next largest type at 36 percent, 51 percent of which is fugitive air releases. Water releases are 9 percent of the hazardous waste. Jefferson is in the top 33 percent of Texas counties for toxic releases in 2004 (USEPA, 2006b). As of 1999, Jefferson County was listed as a “non-attainment” area for ozone standards. A reported 1,591,651 pounds of toxic, carcinogenic air emissions were reported in 1997 and 1,953,018 pounds of industrial, toxic air emissions were reported in that year (Texas Center for Policy Studies, 2000).

Located in Jefferson County is the DuPont Beaumont Plant, which was ranked 3rd in 2004 in the state for hazardous waste releases and accounts for 47 percent of the releases in the county. Also located in Jefferson County are three other facilities; ExxonMobil Oil Beaumont Refinery, Motiva Enterprises LLC Port Arthur Refinery, and Goodyear Tire & Rubber Co. They release more than a million pounds of waste and are in the top 50 facilities for releases in the state (USEPA, 2006b).

Three EPA Superfund sites are in Jefferson County. The first site, Palmer Barge Line (EPA Identification #TXD068104561) was put on the National Priorities List (NPL) on May 11, 2000 and was a municipal landfill from 1956 to 1987. The site encompasses approximately 17 acres and is adjacent to the State Marine Superfund site. Used for industrial purposes, metal structures on the site are salvaged to construct marine equipment. The closest school is about 2.7 miles away, 14 residential properties are located within a 1-mile radius, and the ground water is not a potential drinking water source. A final remedy for the site was established in September 2005 (USEPA, 2006a).

The second site, Star Lake Canal (EPA Identification #TX0001414341) was added to the NPL on July 27, 2000 (USEPA, 2006a). Located in Port Neches, the site is defined as the lengths of two industrial canals, Star Lake Canal and Jefferson Canal. The Star Lake Canal is also known as the Defense Plant Corporation Canal, the Neches Butane Outfall Canal, the Neches Butane Products Company Outfall, and the Texaco Chemical Outfall Canal. The Jefferson Canal is also known as the Texaco Chemical Company Outfall Canal, the Jefferson County Canal, the Star Lake Outfall Canal, and the Texaco Chemical Company Stormwater canal. Both canals were constructed in the 1940s for industrial and stormwater purposes. Surface water flows down the Neches River approximately 3½ miles to Sabine Lake where a fishery is located that produced more than 1 million pounds of fish and shellfish in 1996. Hazardous substances include chromium, copper, polynuclear aromatic hydrocarbons, and polychlorinated biphenyls and could

potentially migrate to Molasses Bayou, Star Lake Canal, Neches River, Sabine Lake, and their associated wetlands (TCEQ, 2006b).

The third EPA Superfund site in Jefferson County is State Marine in Port Arthur (EPA Identification #TXD099801102). It was intended as a wastewater treatment plant for barge cleaning wash water (USEPA, 2006a). Added to the NPL on July 28, 1998, it is located in Port Arthur on a peninsula approximately 0.5 miles southwest of the mouth of the Neches River. The shallow ground water resulted from the adjacent shipping channel dredge materials that were used to build the island where the site is located. The ground water is not considered a potential drinking water source. Plans are to finalize the Supplemental Remedial Investigation in October 2006 and sign the Record of Decision by December 2006 (TCEQ, 2006b).

5.3. History

5.3.1. Prehistory

The earliest inhabitants of Jefferson County were Atakapa Indians and Orcoquiza Indians whose disappearance has been attributed to migration or smallpox epidemics. These native groups occupied the region for two thousand years, but by the time of the first white settlements in the 1820s, European diseases had decimated the Native American population (TSHA, 2001).

5.3.2. Early Settlement

During the 18th century, both the French and Spanish claimed the area. The Spanish tried to limit the French influence within the region by establishing a military presence in eastern Texas, but control of the area changed several times during the 18th and 19th centuries. At the time of the Louisiana Purchase, the area was under Spanish control, and the United States became Spain's rival in the region (Jefferson County, Texas, 2003).

Jefferson County was established in 1836 when Texas gained independence and became the Republic of Texas. Jefferson first served as the county seat; Beaumont succeeded it in 1838. The town of Beaumont was incorporated the following year (TSHA, 2001).

Because of its geographic location, Jefferson County, specifically Beaumont, became important because of its relationship to waterways in the region. Since the county is bounded by the Gulf of Mexico, the Neches River, Sabine Lake, Sabine Pass, and Pine Island Bayou, county residents took full advantage of them, sending goods out on steamboats, sailing ships, and bateaus (Jefferson County, Texas, 2003).

5.3.3. Economic History

Many of the early settlers came from lower southern states. Cajuns (exiled Acadians of French ancestry) came in the 1840s and Europeans—particularly Germans—arrived in the 1850s. During the mid-nineteenth century the economy depended on spinning, leatherwork, and soap and candle-making and was supplemented by shingle manufacturing and timber exports. Shipbuilding also took place next to the lumber mills in Sabine Pass and Beaumont. Cattle also

became important to economic activity, as did the buying and ginning of cotton and rice production (TSHA, 2001).

Slavery was existent in the county but not prevalent. By 1860, slaves comprised 309 of the county's 1,995 residents. The largest slaveholder in the county owned thirteen slaves. Slaves grew corn and sweet potatoes, worked in sawmills and on the railroad, and herded cattle (TSHA, 2001).

After the Civil War, Jefferson County's population decreased and economic recovery was slow, but had regained much of its lumber and shipping activities by 1876. Agriculture did not recover until after 1890 (TSHA, 2001). At that time, commercial rice farming grew into a successful endeavor. In 1892, irrigation canals were dug specifically for rice farming (Jefferson County, Texas, 2003).

In 1901, Anthony Lucas discovered oil at Spindletop, dramatically changing Beaumont. The focus of Jefferson County soon turned to oil production and refining (Jefferson County, Texas, 2003). Oilfield development signaled both an influx of population and economic growth in Jefferson County.

“Spindletop transformed Beaumont into a major industrial center. Refineries, including the Texas Company (Texaco) refinery of Joseph S. Cullinan and Arnold Schlaet (1902) and the Gulf Oil Corporation (now Chevron) refinery, were built at Port Arthur, Port Neches, and Beaumont. By 1949 the county had become highly industrialized and urbanized, with six oil refineries producing total daily capacities of more than a half million barrels, three rice mills, eleven tank farms, and fourteen producing oilfields (TSHA, 2001).”

Jefferson County's involvement in the oil and gas industry is continuing with the proposed Golden Pass LNG facility (FERC, 2005).

By the 1980s, the number of farms had declined precipitously but this represented the emergence of “agribusiness,” which was engaged in the production of rice, soybeans, fruits, nuts, lumber, and cattle. By this time, there were 5,318 businesses in Jefferson County (TSHA, 2001). Not surprisingly, petroleum products accounted for most of the exports leaving the county: “Almost 76,663,975,000 cubic feet of gas well gas, 3,296,208 barrels of crude oil, 4,686,683,000 cubic feet of casinghead gas, and more than 1,000,000 barrels of condensate were produced in 1982, while county ports shipped domestic and foreign goods measured in millions of short tons (TSHA, 2001).”

5.4. Demographic Characteristics

5.4.1. Population Growth

Between 1900 and 1910, extensive in-migration from surrounding counties caused the population to increase dramatically from 14,329 to 38,182. Much of this population growth was attributable to the opening of the Spindletop oil field in 1901, but some was also a result of in-migration of Cajuns after cotton crops were destroyed by boll weevils in nearby Louisiana

counties/parishes. Refinery workers drafted in World War I migrated to the county to work in manufacturing plants. Between 1910 and 1920, the population nearly doubled and increased by another 82 percent during the 1920s (TSHA, 2001).

Population growth reversed during the Depression years, but then rebounded (Table 26). The population reached the 200,000 mark in the 50s, but after 1960 growth began to slow. The county was a net out-migration area in the decades between 1960 and 1990. Although population growth was positive in the 1990s, the county’s population declined relative to other counties and by 2005 Jefferson County had dropped to rank 19 in the state from 5th in the 1940s and 9th in 1980. Despite the decades long decline relative to other counties, Jefferson County still remains in the top 20 out of 254 Texas counties (USDOC, Census, 2005b).

Table 26

Population Changes, Jefferson County, Texas: 1920 to 2005

Year	Population	Rank in State	Change Previous Census	% Change Previous Census	Rank in Growth Rate	Net Migration Since Previous Census
2005	247,571	19	-4480	-1.8	--	--
2000	252,051	14	12,654	5.29	160	1,244
1990	239,397	12	-11,541	-4.60	186	-29,431
1980	250,938	9	6,121	2.50	201	-16,131
1970	244,817	7	-842	-0.34	111	-28,882
1960	245,659	6	50,576	25.93	44	7,551
1950	195,083	6	49,754	34.24	44	0
1940	145,329	5	11,938	8.95	78	NA
1930	133,391	5	60,271	82.43	52	NA
1920	73,120	8	34,938	91.50	13	NA

Source: USDOC, Census, 2005c.

5.4.2. Age and Ethnicity

Non-Hispanic whites comprise 42 percent of the county’s population (Table 27). This proportion has decreased substantially since 1940, when 77 percent of the population was white. The county’s black population, now constituting some 35 percent of the county population, has not increased dramatically over the years. In 1920, blacks made up 27 percent of the county’s residents, and while this number dropped to 23 percent in 1940, by 1990 it had increased again to 31 percent. Hispanics in Jefferson County comprise over 12 percent of the population. Only two percent were Hispanic in 1930, four percent in 1970 and 1980, and five percent in 1990. The median age for the county was 36.5 as of 2005 (USDOC, Census, 2005b).

Table 27**Racial and Ethnic Populations, Jefferson County: 2000 & 2005**

Race/Ethnicity	Population, 2000	Percent, 2000	Population, 2005	Percent, 2005
White	130,604	51.8	97,222	42.0
African American	84,482	33.5	81,720	35.3
Hispanic	26,536	10.5	27,607	11.9
American Indian	654	0.3	343	0.1
Asian	7,236	2.9	7,037	3.0
Pacific Islander	68	0.0	0	0.0
Other Race	185	0.1	15,714	6.8
Two or More Races	2,286	0.9	1,668	0.7

Source: USDOC, Census, 2005b.

5.5. Economy**5.5.1. Income and Poverty**

The median family income of Jefferson County during the period 1950 to 1980 exceeded the state median. Beginning in 1990, the median income began to fall below the state median and in 2005 sits at 0.92 of the state median at \$40,568 (2000\$). In 2005, almost one-fifth of the population lived in poverty and one percent received public assistance. While the approximate proportion of individuals living in poverty has remained stable in the past two decades, the percent receiving public assistance has declined (Table 28). Female-headed households with children made up 11 percent of all families in 2005 (USDOC, Census, 2005b).

Table 28**Income, Poverty and Family Structure, Jefferson County**

Year	Median Family Income	% Change Previous Census	Ratio to State	Ratio 80th and 20th Percentile	% Persons in Poverty	% Public Assistance	% Female Heads of Household with Children
2005	40,568	-4.1	0.92	--	19.0	1.1	44.9
2000	42,290	-1.8	0.92	--	17.4	4	36.2
1990	43,094	-15.6	0.98	4.12	19	8	22
1980	51,075	20.6	1.10	3.83	13	6	17
1970	42,357	19.5	1.06	3.03	15	5	10
1960	35,450	35.2	1.23	2.92	-	-	-
1950	26,211	-	1.35	2.82	-	-	-

Source: USDOC, Census, 2005b and 2005c.

5.5.2. Employment

Tenant farming increased between 1900 and 1910, and though it declined somewhat after 1910, by the Great Depression the number of tenant farmers had once again increased. Generally, Jefferson County did not experience the degree of hardship that many other counties experienced during the Great Depression. Shipping continued, as did petroleum, crop, and livestock production. In 1930, Jefferson County was home to 141 manufacturing establishments (TSHA, 2001).

In 1940, the manufacturing industry employed 33 percent of the county's workforce—more than any other industry—and increased its share by 42 percent between 1940 and 1950 (Table 29). Rice production and cattle ranching was significant during the 1940s. By 1942, Jefferson County had the world's largest synthetic rubber plant. There were six oil refineries, three rice mills, 11 tank farms, and 14 oil producing fields in the county that year. New plants were established soon after for chemical and petrochemical production (TSHA, 2001).

In 1956, approximately 26 million tons of materials were shipped from Jefferson County ports. The county's economy by 1960 was primarily based on commercial banking and chemical/petroleum products manufacturing. The manufacturing industry in 1960 employed 31 percent of all county workers (TSHA, 2001).

In the 1980s, agribusiness changed the face of agriculture in the county, primarily producing rice, soybeans, fruits, nuts, forest products, and cattle. Oil production and manufacturing continued to do well, as did shipping (TSHA, 2001). Though the service industry grew in the 1980s, in 1990, manufacturing employed 18 percent while the wholesale and retail trade industry employed 22 percent of the county's working population (USDOD, Census, 2005b). Earnings from manufacturing reached \$1 billion (in constant 2000 dollars) in 1990 and contributed 22 percent of all workers' earnings in 1998 (Table 30) (USDOD, BEA, 2005).

Since the 1940s, the share of the manufacturing industry in employment has been steadily declining and in 2005 employed 10 percent of the workforce. Service industries have maintained overwhelming growth in employment, starting from 23 percent of the workforce in 1940 and climbing to 45 percent in 2005.

Growth in the early 21st century also shows a relatively even distribution across industry sectors in rough proportion to each sectors' overall earnings share (Table 31). The strongest sector growth has been in manufacturing, particularly in petroleum and coal products manufacturing. This sector accounted for 24 percent of earnings in 2004 and for 37 percent of earnings growth between 2001 and 2004, with 75 percent of the 37 accounted for by growth in petroleum and coal products manufacturing (USDOD, BEA, 2005).

Table 29

Employment in Major Industrial Sectors, Jefferson County: 1940-2005

Year	Agric., Fishing & Forestry	Mining	Constr.	Manuf.	Trans., Comm. & Public Utilities	Wholesale & Retail Trade	Finance, Ins. Real Estate	Services	Public Admin.
Workers in sector									
2005	1,136		8,594	10,127	5,705	15,155	4,990	44,006	6,929
2000	1,540		8,134	13,798	7,437	15,693	4,470	42,121	6,447
1990	1,345	706	7,156	17,326	7,730	22,163	4,421	34,449	3,483
1980	1,097	1,434	8,723	26,070	9,914	23,143	4,701	28,572	3,710
1970	1,030	1,888	6,416	25,325	6,855	18,466	3,161	28,627	2,950
1960	1,591	1,580	6,162	26,131	6,450	17,096	2,964	19,329	2,322
1950	1,476	973	6,138	23,195	6,637	15,591	2,178	14,897	1,978
1940	1,726	801	2,848	16,363	4,790	10,070	572	11,570	1,107
Workers in sector (%)									
2005	1.2		8.7	10.3	5.8	15.4	5.1	44.6	7.0
2000	1.5		8.2	13.8	7.4	15.8	4.5	42.2	6.5
1990	1.4	0.7	7.2	17.5	7.8	22.4	4.5	34.9	3.5
1980	1.0	1.3	8.1	24.3	9.2	21.6	4.4	26.6	3.5
1970	1.1	2.0	6.8	26.7	7.2	19.5	3.3	30.2	3.1
1960	1.9	1.9	7.4	31.2	7.7	20.4	3.5	23.1	2.8
1950	2.0	1.3	8.4	31.7	9.1	21.3	3.0	20.4	2.7
1940	3.5	1.6	5.7	32.8	9.6	20.2	1.1	23.2	2.2
Growth from previous census (%)									
2005	-26.2		5.7	-26.6	-23.3	-3.4	11.6	4.5	7.5
2000	These are not directly comparable due to the 1997 switch from SIC to NAICS								
1990	22.6	-50.8	-18.0	-33.5	-22.0	-4.2	-6.0	20.6	-6.1
1980	6.5	-24.0	36.0	2.9	44.6	25.3	48.7	-0.2	25.8
1970	-35.3	19.5	4.1	-3.1	6.3	8.0	6.6	48.1	27.0
1960	7.8	62.4	0.4	12.7	-2.8	9.7	36.1	29.8	17.4
1950	-14.5	21.5	115.5	41.8	38.6	54.8	280.8	28.8	78.7

Source: USDOC, Census, 2005b and 2005c.

Table 30**Earnings in Major Industry Sectors and Selected Sub-Sectors,
Jefferson County: 1990-1998**

Industry	Earnings (Constant 2000 \$1000s)		Share of 1998 (%) Earnings	Change 1990-1998 (\$)	Share of Change (%) 90-98
	1990	1998			
Earnings	4,310,087	5,017,269	100.0	707,182	100.0
Farm earnings	12,883	7,723	0.2	-5,161	-0.7
Ag. services, forestry, fish.	22,061	19,629	0.4	-2,432	-0.3
Fishing	10,790	NA	NA	NA	NA
Mining	59,135	21,765	0.4	-37,369	-5.3
Oil and gas extraction	NA	NA	NA	NA	NA
Construction	400,965	548,087	10.9	147,123	20.8
Special trade contractors	149,743	236,175	4.7	86,432	12.2
Manufacturing	1,019,759	1,085,140	21.6	65,381	9.3
Fabricated metal products	64,831	84,715	1.7	19,884	2.8
Industrial mach. & equip.	18,619	27,204	0.5	8,584	1.2
Food and kindred	12,247	12,514	0.2	267	0.0
Chemicals and allied	380,285	424,080	8.5	43,795	6.2
Petroleum and coal	445,827	365,597	7.3	-80,230	-11.4
Transportation, public utilities	392,283	329,543	6.6	-62,740	-8.9
Trucking and warehousing	42,570	52,117	1.0	9,547	1.4
Water transportation	98,440	45,695	0.9	-52,745	-7.5
Transportation by air	6,259	14,417	0.3	8,157	1.2
Wholesale trade	203,646	209,309	4.2	5,663	0.8
Retail trade	401,762	459,681	9.2	57,919	8.2
Eating and drinking places	89,623	116,202	2.3	26,580	3.8
Fin., ins., and real estate	139,231	184,623	3.7	45,392	6.4
Services	1,112,881	1,438,902	28.7	326,021	46.1
Business services	146,309	183,916	3.7	37,608	5.3
Health services	509,103	558,108	11.1	49,005	6.9
Legal services	124,779	278,582	5.6	153,803	21.8
Engineer. & mngmt. serv.	126,677	172,685	3.4	46,008	6.5
Government	545,482	712,867	14.2	167,385	23.7

Source: USDOC, BEA, 2005.

Table 31

**Earnings in Major Industry Sectors and Selected Sub-Sectors,
Jefferson County: 2001-2004**

Industry	2001	2004	% Share of 2004	\$ Change	% Share of Change
Compensation of employees	4,914,403	5,656,017	100%	741,614	100%
Farm compensation	3,722	3,795	0%	73	0%
Forestry, fishing, related activities, and other	3,382	3,429	0%	47	0%
Mining	13,555	13,785	0%	230	0%
Utilities	75,545	118,295	2%	42,750	6%
Construction	514,533	486,403	9%	-28,130	-4%
Manufacturing	1,062,613	1,334,401	24%	271,788	37%
Petroleum and coal products manufacturing	388,762	592,483	44%	203,721	75%
Chemical manufacturing	400,451	443,287	33%	42,836	16%
Fabricated metal product manufacturing	102,110	124,130	9%	22,020	8%
Wholesale trade	172,528	199,156	4%	26,628	4%
Retail trade	389,001	430,717	8%	41,716	6%
Transportation and warehousing	174,179	198,106	4%	23,927	3%
Information	102,701	122,108	2%	19,407	3%
Finance and insurance	144,187	140,392	2%	-3,795	-1%
Real estate and rental and leasing	45,756	69,289	1%	23,533	3%
Professional and technical services	337,905	418,922	7%	81,017	11%
Management of companies and enterprises	15,863	40,661	1%	24,798	3%
Administrative and waste services	159,949	153,425	3%	-6,524	-1%
Educational services	17,701	19,990	0%	2,289	0%
Health care and social assistance	568,332	649,734	11%	81,402	11%
Arts, entertainment, and recreation	10,852	12,927	0%	2,075	0%
Accommodation and food services	140,018	155,779	3%	15,761	2%
Other services, except public administration	137,219	157,601	3%	20,382	3%
Government and government enterprises	824,862	927,102	16%	102,240	14%

* All major categories are shown as well as the top three subcategories in manufacturing.

Source: USDOC, BEA, 2005.

Unemployment in the county has remained, on average, 2.4 percent higher than the average unemployment rate for Texas and 2.8 percent higher than the average unemployment rate for the U.S. over the past 10 years (Figure 14) (USDOL, BLS, 2006b and 2006c).

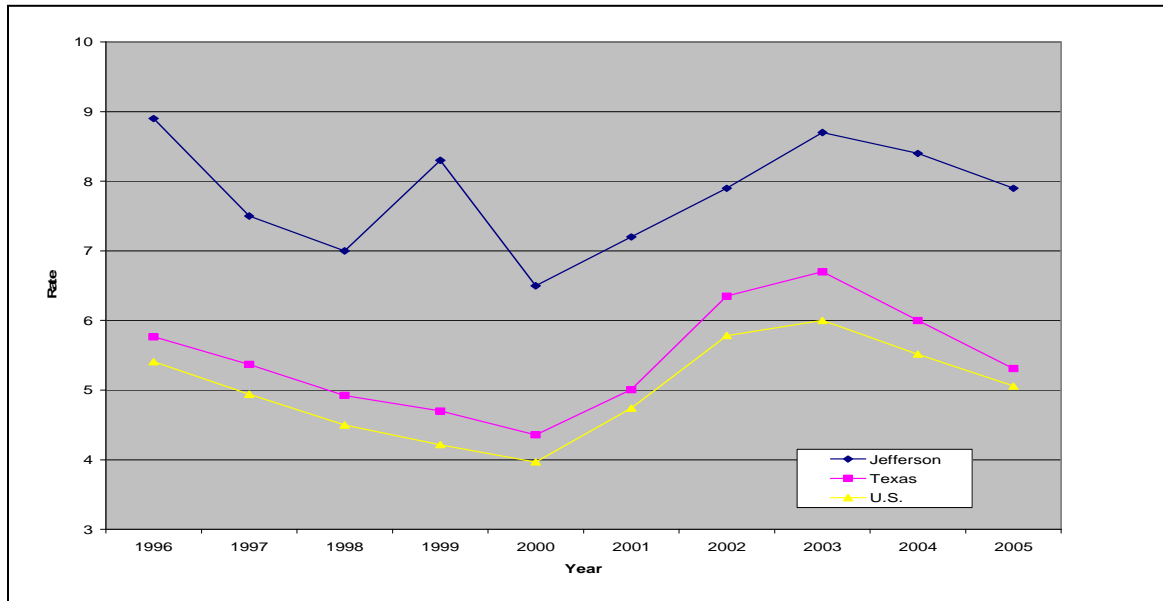


Figure 14. Unemployment rate for Jefferson County, Texas, and the U.S.: 1996–2005.

5.5.3. Marine-Based Activities

The port facilities in Beaumont and Port Arthur play central roles in Jefferson County. In 2002, some 66,000 person-hours were logged by the International Longshoremen Association at Port Arthur, representing about \$1.4 million in wages. The port handled 884,223 tons of cargo that year. The port also receives about 700,000 pounds of steel slabs annually. These are used for pipe and tube products for the oil and gas industry (Port Arthur News, 2002).

Many residents of Jefferson County are employed in the marine transportation industry, have grown up around large vessels, and base their lives around their ability to navigate the area’s waterways. There is a strong society of mariners and offshore oil riggers in the county. There are numerous opportunities for recreational fishing and boating in this area. The Gulf of Mexico is quite distant for small boats to reach on a regular basis, but there are a few “blue water” boats moored in the Beaumont and Port Arthur areas. These tend to be used by fairly affluent anglers for whom the fuel costs to the offshore waters are not a factor. Most small boat anglers fish in the rivers, Sabine Lake and other inland waters. Some local guide boats carry angling tourists to productive spots for redfish and speckled trout.

There is a strong commercial shrimp fishery based in the Sabine Pass/Sabine area. The fleet is comprised and supported by a close-knit Vietnamese community, which has made significant inroads in the industry over the past decades. Here, trawlers moor along massive lifts, cranes, and other infrastructure used for offshore oil drilling. But as indicated in Table 32 below, only the wholesale sector of the seafood industry has enjoyed significant growth, while the harvesting

sector has actually been on the decline. There are numerous wholesale operations observable in Port Arthur and other areas; these are typically Vietnamese-run and supported by the Sabine Fleet. IAI (2005) indicates that about 20 percent of all state and federal commercial fishing licenses in the state of Texas are held in Jefferson County.

Table 32

Jefferson County Employment in Marine Fisheries

Sector	1990 Employment	1995 Employment	Percent Change
Commercial Harvesting	1,528	1,208	-20.9
Processing	153	159	3.8
Wholesale	8	51	537.5
Retail	841	920	9.41

Source: Dokken et al., 1998.

5.5.4. Military Installations

Apart from small National Guard facilities, there are no land-oriented military installations in Jefferson County. The United States Coast Guard Galveston Base Unit operates a search and rescue and navigation maintenance fleet and facility at Sabine.

5.5.5. Tourism and Recreation

Beaumont has some 2,200 hotel/motel rooms available. Local attractions include hunting and fishing, the Art Museum of Southeast Texas and Museum of the Gulf Coast, birding, the Sabine Pass Battleground State Historical Park, the McFaddin Ward House, Big Thicket National Preserve, and Sea Rim Park. The McFaddin Wildlife Refuge, the J.D. Murphy Wildlife Management Area, the Angelina National Forest, the Davy Crockett National Preserve, the Sabine and Sam Houston National Forests, and the Anahuac National Wildlife Refuge provide recreational activities for outdoor enthusiasts. Local festivals include the Heritage Festival, the Neches River Festival, the Beaumont Jazz Festival, Spindletop Boom Days, the South Texas Fair, the Saltwater Anglers Fishing Tourney, and CavOILcade (TSHA, 2001).

5.6. Local Government

5.6.1. Governmental Structure

Like all Texas counties, Jefferson is governed by a Court of Commissioners led by a County Judge. The Commissioners meet each Monday at the County Courthouse. The County Judge presides over a wide variety of actions and responsibilities. Among the most important of these are the Probate Court, civil defense, disaster relief, and county welfare. There are six active Constables in the county.

Law enforcement agencies in Jefferson County include the Beaumont, Groves, Lamar University, Nederland, Port Arthur, and Port Neches police departments. The Constable's offices are located in Beaumont, Port Arthur, Hamshire, China, and Groves. There is also the

Jefferson County Sheriff’s Department. Emergency services operate 17 fire departments within the county. Eight companies have facilities within the county seat of Beaumont (Texas Commission on Fire Protection, 2006).

5.6.2. Revenues and Taxation

The county tax rate is \$0.425 per \$100 (Texas Association of Counties, 2004b). The city tax rate in Beaumont is \$0.635 per \$100, the Independent School District Tax Rate is \$1.54 per \$100, the Drainage District rate is \$.20 per \$100, the special district rate for the Port of Beaumont is \$.08 per \$100, and the special district rate for the Navigation District is \$.18 per \$100 (Jefferson County, Texas, 2007).

5.6.3. Voter Registration

As noted in Table 33 below, the number of registered voters has increased only slightly in recent years. For 2000 and 2004, when the public voted on state and nationwide offices, more than half of the registered voters cast ballots. In the other years, voter turnout was closer to a third of registered voters.

Table 33

Voter Registration and Voting: Jefferson County, 1988-2004

Year	Registered Voters	Voted	Percent Voted
1988	142,899	91,693	64.1
1990	131,173	63,907	48.7
1992	135,220	95,518	70.6
1994	139,052	65,837	47.3
1996	160,100	84,426	52.7
1998	166,645	61,641	36.9
2000	166,238	89,909	52.3
2002	164,006	55,456	33.8
2004	165,174	91,866	55.6

Source: Texas Secretary of State, 2006.

5.7. Social Context

5.7.1. Education

Lamar University and Lamar Institute of Technology have branch campuses in Beaumont and Port Arthur. Lamar University at Port Arthur was founded as Port Arthur Business College in 1909, and became a part of the Lamar University System in 1975. The college offered a variety of associate degrees to some 3,100 students in 2003 (TSHA, 2001).

Jefferson County’s performance in elementary and secondary education, in recent years, tends to fall below state averages. Since 2002, when the percent of high school graduates equaled the overall percent of the state (82.8%), the percent of graduates has declined relative to the state. In 2004, the percent of graduates was 82.4 percent, compared to 84 percent for all of Texas. Passing

rates on the Texas Assessment of Knowledge and Skills (TAKS) test also consistently falls below the state average at all grade levels (see Figure 15 and Figure 16 for percent passing by grade level) (Kids Count, 2006). Average SAT and ACT scores also fall below the state average. The average SAT score is 930, compared to the state average of 992 in 2005. The average ACT score is 19.2, compared to the state average of 20.0 in 2005 (Texas Education Agency, 2006).

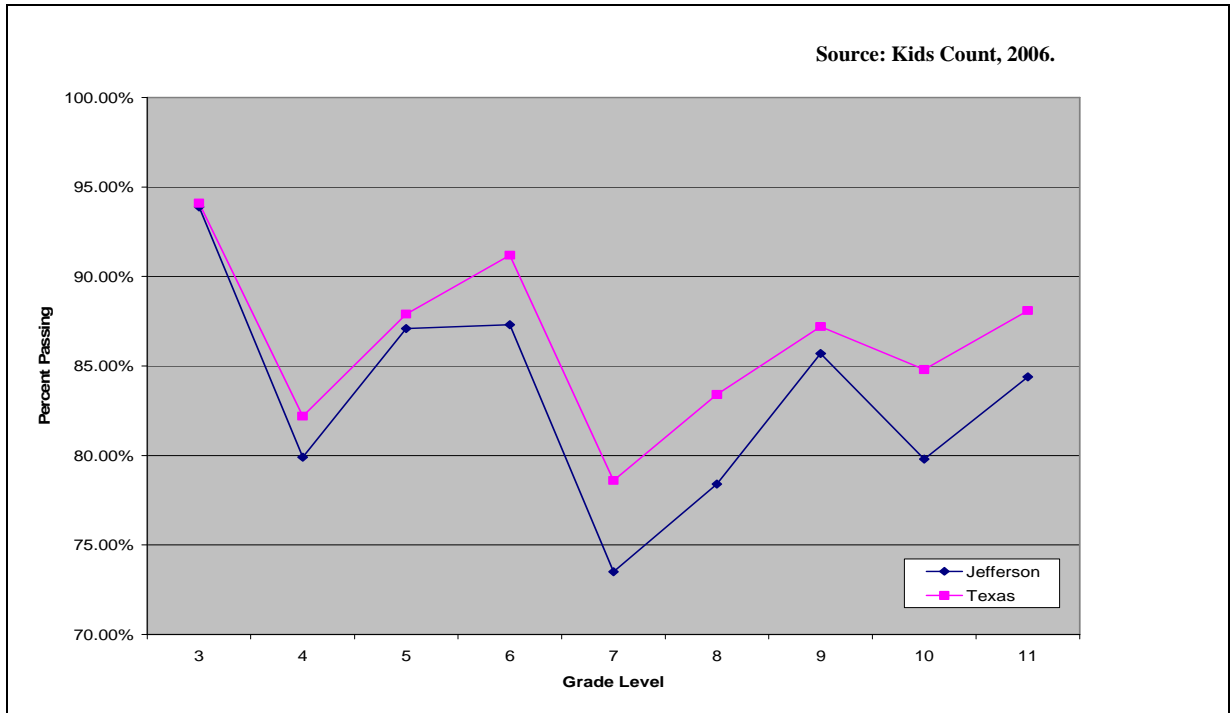


Figure 15. TAKS reading (2006).

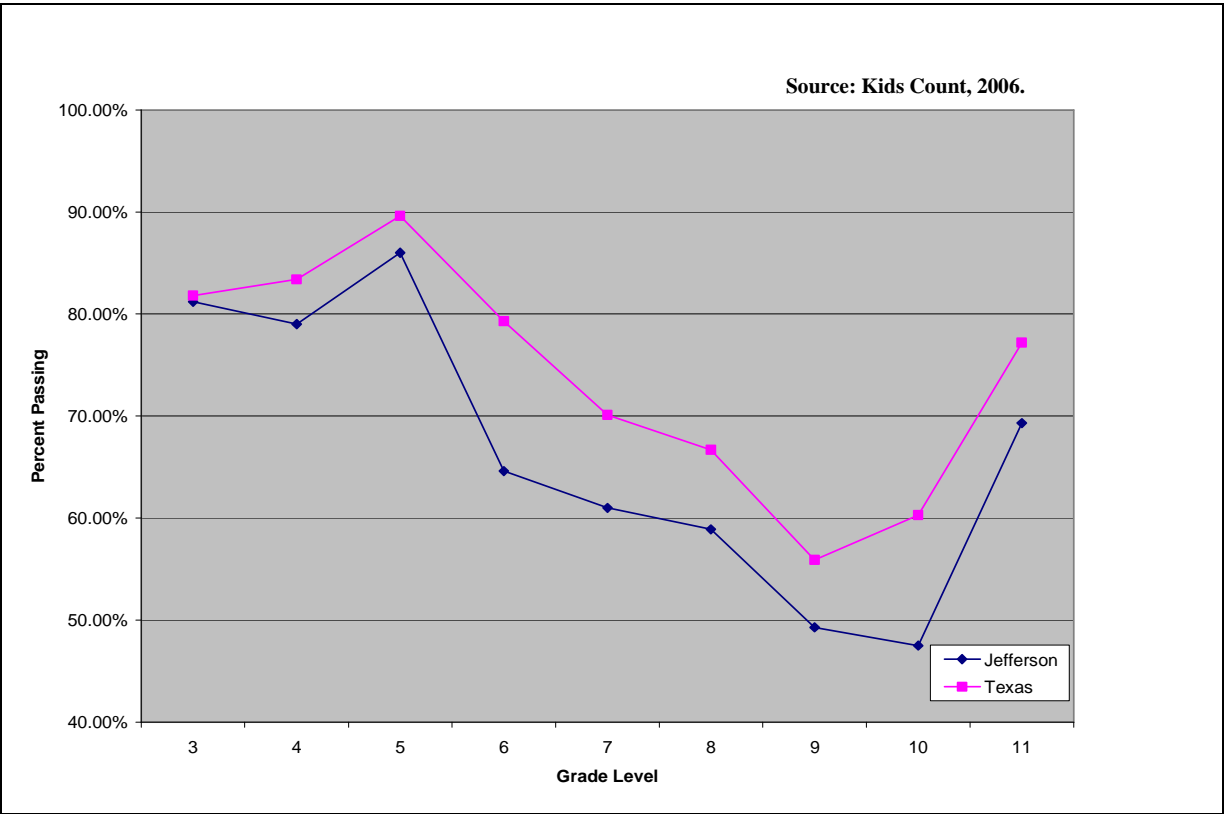


Figure 16. TAKS math (2006).

During the 2003-04 school term, 64 percent of Jefferson County’s (Education Service Center Region 05: Beaumont) educational expenditures went towards regular education. Per pupil total operating expenditures were \$6,980 and per pupil instructional expenditures were \$3,971. Over 20 percent of faculty in this district possessed a master’s degree or higher credential. The average teacher’s salary for Jefferson County in 2000 was \$38,253 (Texas Education Agency, 2004).

The attainment of high school education by Jefferson County adults is higher than the state average; 83.2 percent had completed high school in 2005, compared to 78.8 percent for the state and 84.2 percent nationally. However, the proportion with college degrees is less than that of Texas as a whole: 19.4 percent of adults in 2005 held at least a college degree (Table 34), compared with 25.1 percent for the state and 27.2 percent nationally (USDOC, Census, 2005b).

Table 34**Educational Attainment of Adults (age 25+), Jefferson County**

Year	Educational Attainment of Adults					Ratio to State	
	0-8 years (percent)	% Some High School	% High School Diploma	Some College	% BA/BS or more	High School Diploma or More	BA/BS or more
2005	7	9	33	31	19	1.06	0.76
2000	8	14	33	29	16	1.03	0.69
1990	11	16	35	22	16	1.03	0.77
1980	18	18	33	17	14	1.01	0.80
1970	28	25	27	11	9	0.99	0.87
1960	38	20	25	10	7	1.08	0.92
1950	44	22	20	8	6	1.09	0.99
1940	53	20	15	7	5	1.08	1.07

Source: USDOC, Census, 2005c.

5.7.2. Health and Welfare

Relative to other Texas counties, Jefferson County did not perform well on health status indicators. Of the 3,388 total live births in 2002, 9.2 percent were low birth weight; this exceeds slightly the state figure of 7.7 percent. The figure was 7.8 percent for whites, 12.3 percent for blacks, and 6.1 percent for Hispanics. The percentage of cases with inadequate prenatal care is 16.3 percent; corresponding race-specific figures were 11.5 percent for whites, 21.4 percent for blacks, and 14.6 percent for Hispanics. The infant mortality rate was 9.7 compared to 6.4 for the state (Texas Dept. of State Health Services, 2006). The fertility rate in 2005 was 4.7 percent and the death rate was 1.0 percent for Jefferson County (USDOC, Census, 2005b).

The ratio of the population per direct care physician was 470 in the county in 2002, compared to the statewide figure of 661. The ratio of the population per dentist was 2,377, which stood below the state figure of 2,820. The county had eight acute care hospitals with 1,953 licensed beds and 1,302 staffed beds and 14 nursing homes provided 1,772 licensed beds. Some subcounty areas/populations in Jefferson County were designated Health Professional Shortage Areas and Medically Underserved Areas as of March 2002 (Texas Dept. of State Health Services, 2006).

In 2004, the teen violent death rate in Jefferson County was 26.9 per 100,000, placing it 117th of 254 reporting counties (where 1 indicates the lowest incidence). The percentage of teens that were neither in school nor in the labor force in Jefferson County in 2000 was 11.9 percent, which nearly equals the state figure of 11.1 percent. Jefferson County was 80th of 254 counties (Kids Count, 2006).

In 2003, 25.5 percent of children in the county lived in poverty, which is above the state percentage of 22.8. The county ranks 161 of 254, where 1 reflects the lowest rate of poverty. As of 2004, 4.6 percent of Jefferson children were part of families who received TANF. This is above the 2004 state percentage of 3.5 percent; the county ranks 51 of 254, where 1 reflects the highest percentage. The rate per 1,000 of children in foster care in the county in 2005 also

exceeded the state rate (5.9 in Jefferson and 5.1 in the state as a whole). For this parameter, Jefferson County ranks 122 of 254. The rate of cases of child abuse or neglect in 2005 was 9.5; this is just below the state rate of 9.8. The county ranks 176 where 1 reflects the highest rate of confirmed cases of abuse or neglect (Kids Count, 2006).

5.7.3. Recreation

Jefferson County is home to the South Texas State Fair, the J.D. Murphree Wildlife Refuge, Sabine Pass Battleground State Historical Park, and the Tex Ritter Park. There are many outdoor opportunities available; duck hunting and salt-water fishing are popular activities. Annual events include the Heritage Festival at Nederland, the Neches River Festival in Beaumont, and the Beaumont Jazz Festival (TSHA, 2001).

5.7.4. Religion

An estimated 65 percent of the population in Jefferson County reported to be religious adherents in 2000. Of those, 39 percent were Catholic, 46 percent were Evangelical Protestant, and 13 percent were mainline Protestant (ARDA, 2006b).

5.8. OCS-Related Infrastructure

Jefferson County ranks 3rd highest in terms of concentration of OCS-related infrastructure with:

- 4 refineries
- 2 petrochemical plants
- 59 terminals
- 2 ports
- 5 shipyards
- 3 ship repair facilities
- 2 supply bases
- 4 natural gas processing facilities
- 1 natural gas storage facility
- 11 heliports

BOEM's ranking system incorporates employment, pollutant release, and surrounding population data. Figure 7 (Section 4.8, above) shows the ranking of 2000 Census tracts with OCS-related infrastructure while Figure 8 (Section 4.8, above) shows the ranking of Census block groups with OCS-related infrastructure. Jefferson County lies to the east of Harris and Galveston counties. The southern part of Jefferson County is sparsely populated due to its marshy habitat. This southern part shows up as one tract with some OCS-infrastructure. There are additional tracts to the north along the Sabine River with OCS-related facilities. The tracts and blocks in Jefferson County rank between 11th and 20th in terms of OCS-related infrastructure.

Figure 17 is an overlay of the OCS-related facilities with the population educational level for Jefferson County. There are no blocks where half or more of the population holds Bachelor's

degrees and four areas where 21 to 50 percent of the population holds Bachelor's degrees. There is no visual correlation between these areas and the OCS-related infrastructure.

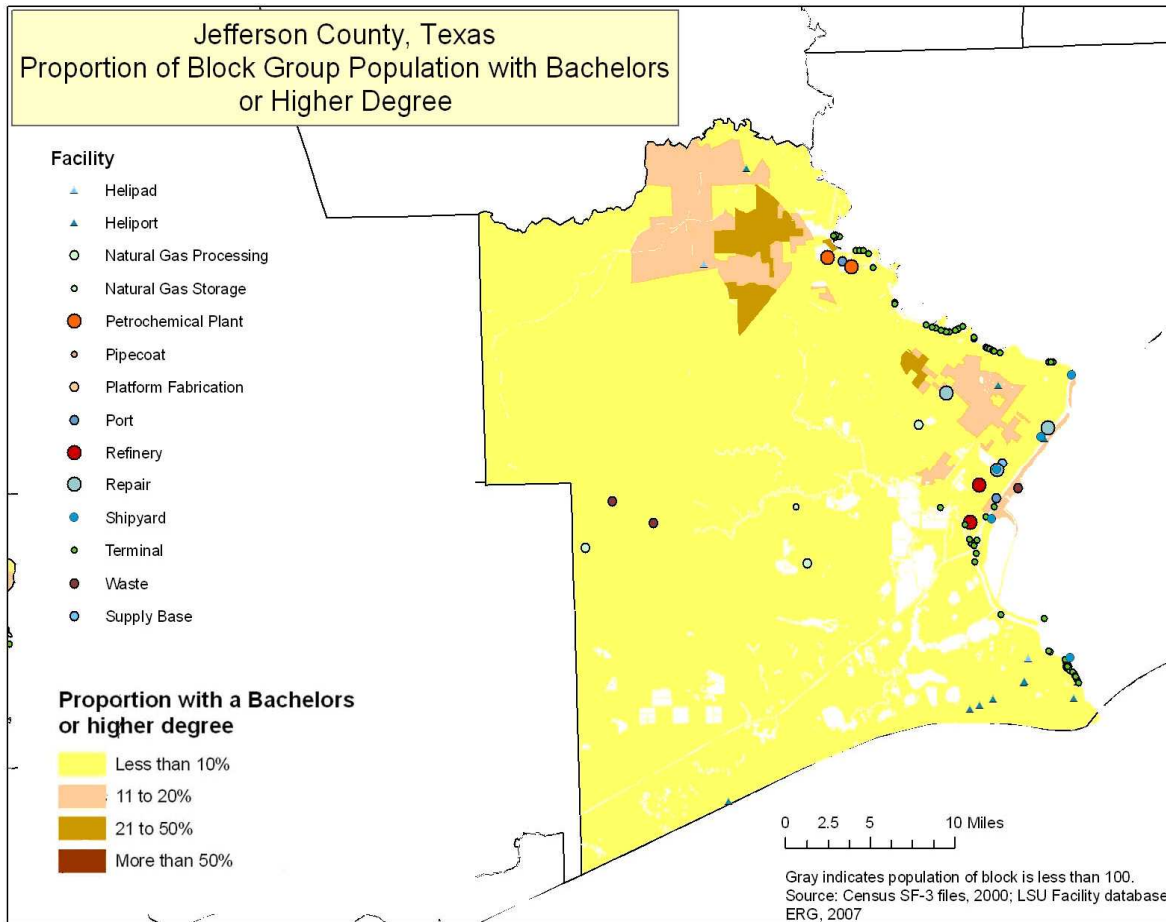


Figure 17. Jefferson County, Texas. Overlay of OCS-related infrastructure and educational level.

Figure 18 lays the percentage of black population within block groups over the OCS-related facilities within Jefferson County. There are several areas where 75 percent or more of the population is black. There appears to be a cluster of two refineries and two petrochemical plants and areas with high proportion of minority populations. A different situation is seen with the Hispanic population (Figure 19). There are no large areas with more than 50 percent Hispanic population. There is no visual correlation between concentrations of Hispanic population and OCS-related infrastructure.

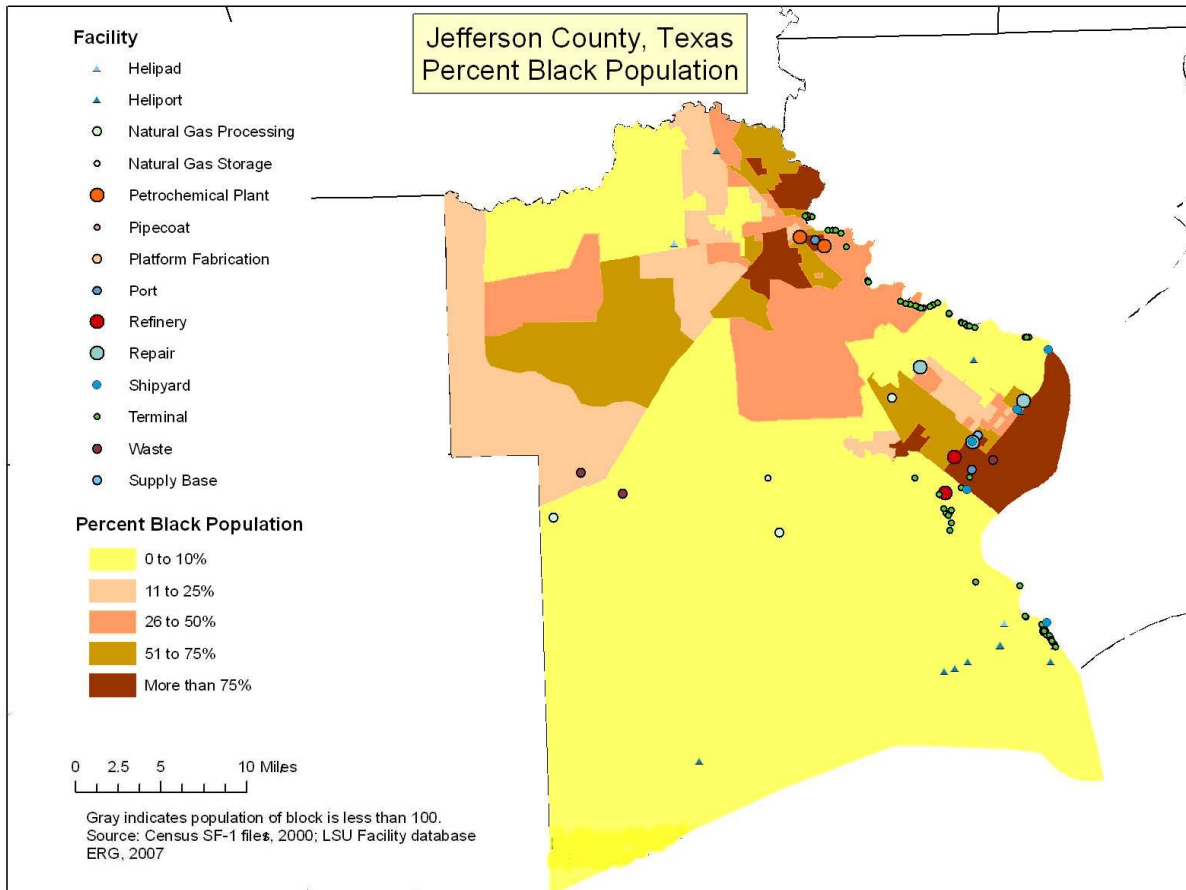


Figure 18. Jefferson County, Texas. Overlay of OCS-related infrastructure and percentage of black population.

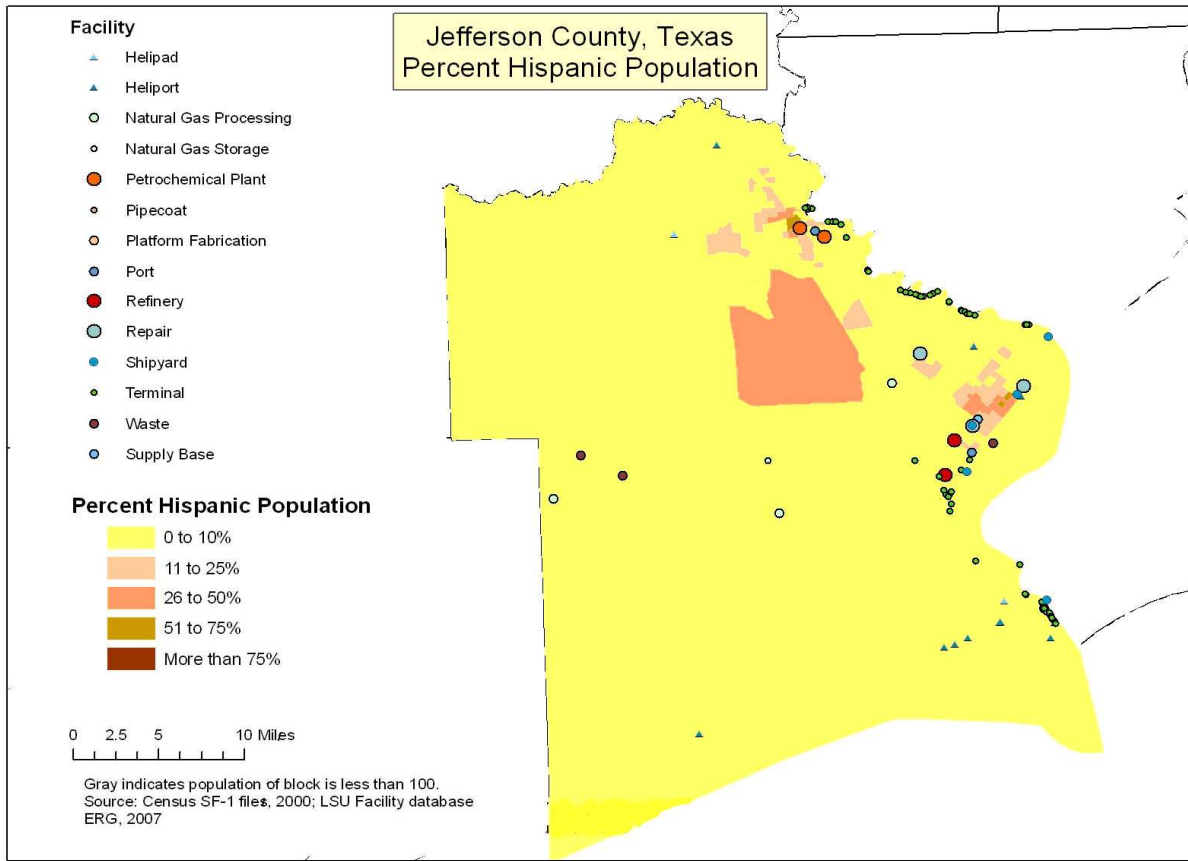


Figure 19. Jefferson County, Texas. Overlay of OCS-related infrastructure and percentage of Hispanic population.

Figure 20 overlays OCS-related infrastructure with block group median income. As you go up the Sabine River from the Gulf of Mexico, there is a low income area shown in yellow that appears to correlate with a petrochemical plant, a refinery, and several other types of OCS-related infrastructure.

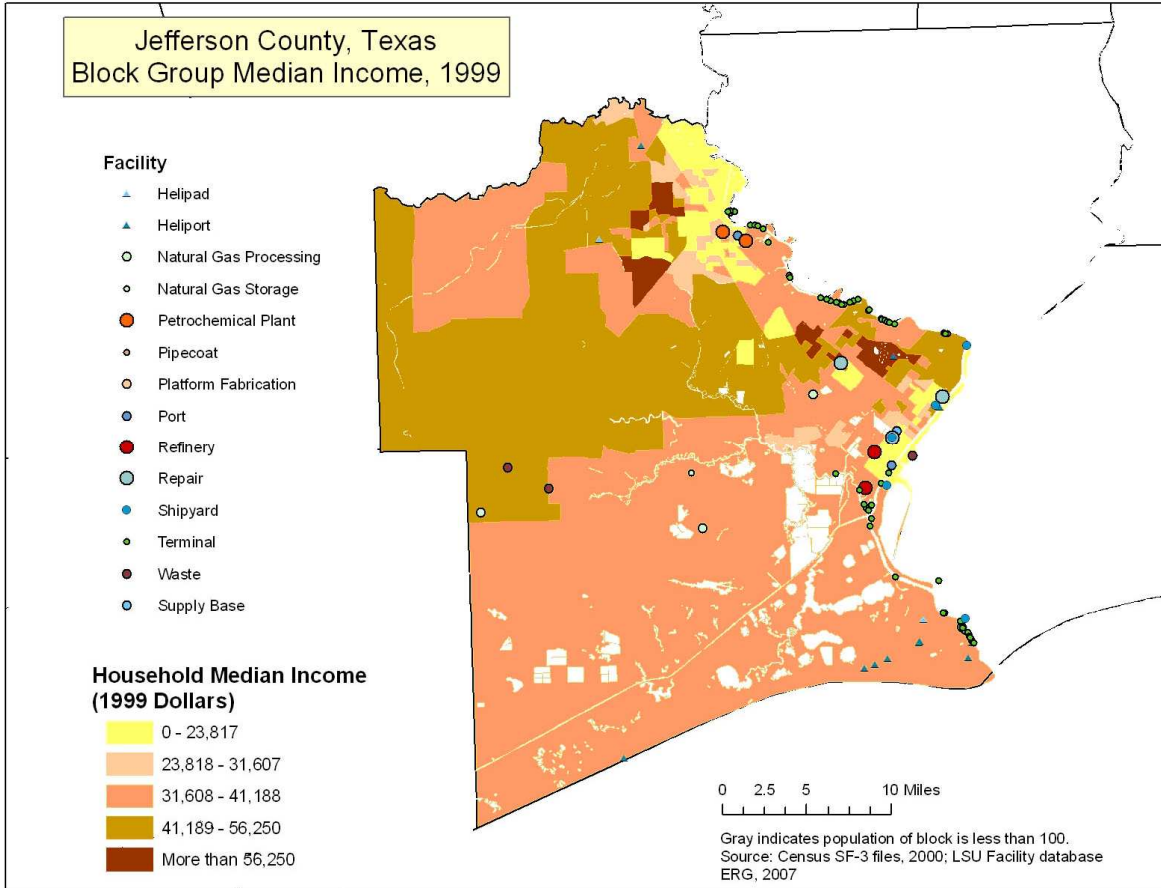


Figure 20. Jefferson County, Texas. Overlay of OCS-related infrastructure and median income.

Figure 21 displays the proportion of the population with income below the poverty level. The area discussed for Figure 17 now has several gradations within the block groups. A second area, further upstream, has a visual correlation between a repair facility and a shipyard within an area with a high percentage of the population with an income below the poverty level.

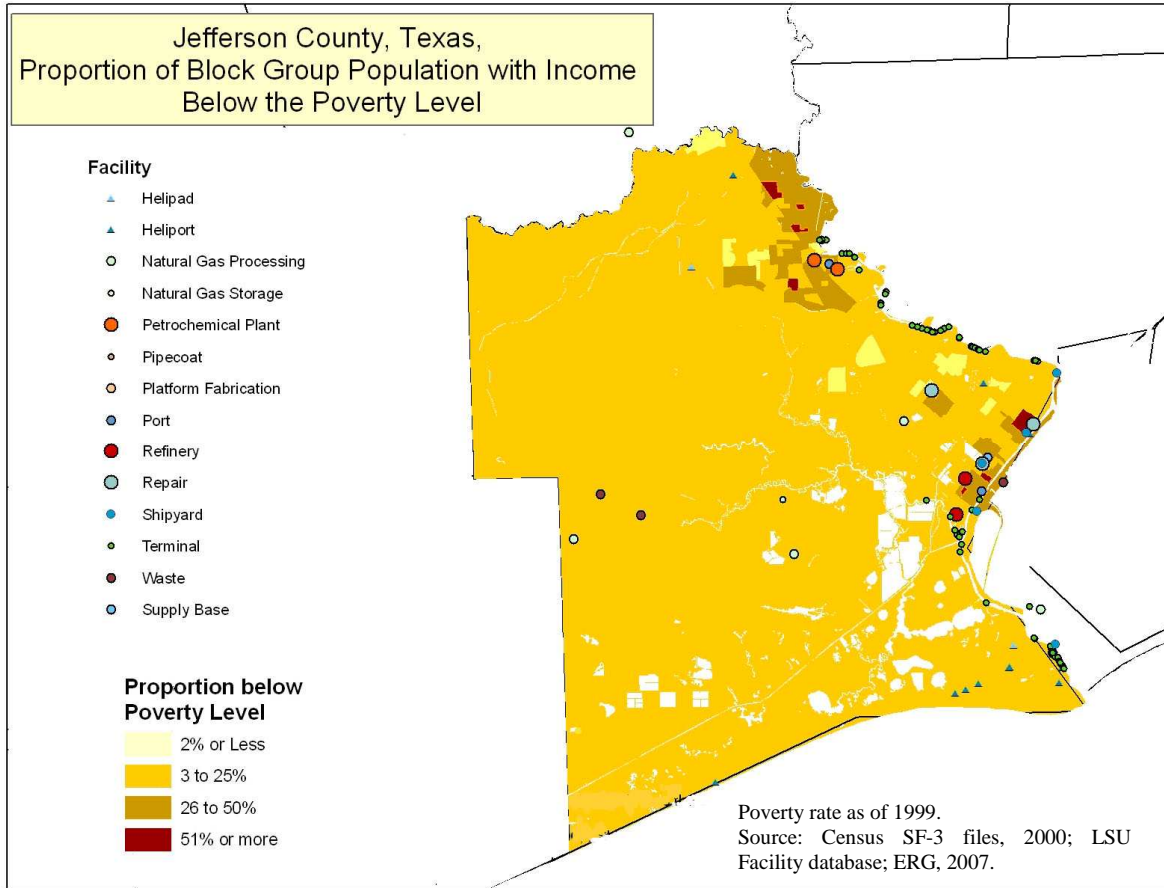


Figure 21. Jefferson County, Texas. Overlay of OCS-related infrastructure and poverty level.

5.9. Impacts from Hurricanes Rita and Katrina

Hurricane Rita was an intense storm that blossomed from tropical storm to Category 5 strength within 36 hours in the Gulf of Mexico in September 2005. With a 30-mile wide eye, wind speeds reaching 165 knots, and the fourth-lowest central pressure on record in the Atlantic basin, the approach of Hurricane Rita led to a mandatory evacuation order in Jefferson County issued on September 21 and 22 (Griffith, 2005). Hurricane Rita, however, abruptly weakened on September 23, changed direction, and made landfall as a Category 3 storm in southwestern Louisiana just east of Sabine Pass and slightly to the east of Jefferson County (Knabb et al., 2006a).

Jefferson County ranks 3rd in terms of concentration of OCS-related infrastructure with the structures listed in the previous section. All these facilities lie just to the west of Hurricane

Rita's eye when it made landfall. Many of the facilities, e.g., refineries and petrochemical plants, shut down in advance of the approaching storm. The National Hurricane Center recorded a 5-foot storm surge in Sabine Pass (USDOE, EIA, 2005c; Knabb et al., 2006a).

The damage to Jefferson County was widespread. The Port Neches water treatment plant was destroyed. With little water supplies, no gas, no electricity, and wide-spread damage to homes and buildings, those who ignored the evacuation orders were asked to leave the area (Lane et al., 2005). The evacuation order was not rescinded until October 11, 2005 (Griffith, 2005).

Lack of power meant that OCS-related infrastructure, such as refineries, could not complete assessments and begin restarting operations. On October 5, Entergy reported restoring power to the four refineries. The refineries came on line:

- October 11: Valero
- October 12: Total
- October 19: ExxonMobil
- October 25: Motiva

By November 2, all were operating at or near full rate (USDOE, OE, 2005). DOE's assessment was that Hurricane Rita landed a significant blow to the U.S. refining industry, but not the knockout that had been feared (USDOE, EIA, 2005c). Even with the recovery of refining capability, DOE was still reporting damage to natural gas reprocessing facilities in the area at the end of 2005 (USDOE, EIA, 2005d).

Jefferson County accounts for about 20 percent of the total shrimp production. Hurricane Rita's winds and storm surge drove many of the fishing vessels on shore. When the National Marine Fisheries Service established a moratorium on the issuance of new Federal Gulf shrimp vessel permits, the agency noted that hurricane damage reduced the number of active vessels qualifying for a permit. However, an industry group indicated that Texas' production of wild-caught shrimp would not be adversely impacted by Hurricane Rita (Wild American Shrimp, 2005; USDOC, NMFS, 2006).

Local Area Unemployment Statistics for Jefferson County indicate an annual unemployment rate of 8.4 percent for 2004 (Figure 22). Unemployment declined to 7.4 percent in September 2005 and increased sharply to 11.5 percent in October 2005. Jefferson County had an annual unemployment rate of 7.9 percent for 2005. Unemployment rates have been declining through the year 2006 and the most recent information is an unemployment rate of 6.0 in October 2005 (USDOL, BLS, 2006b). The annual unemployment rates, then, mask the effect of Hurricane Rita. Unemployment rates, on an annual basis, drop from 8.4 percent in 2004, to 7.9 percent in 2005, to an annualized rate of 6.8 percent through October 2006. Hurricane Rita's effects are most clearly seen by comparing the October unemployment rates—8.0 percent for 2004, 11.5 percent in 2005, and 6.0 percent in 2006. The lower unemployment rates during 2006 may reflect the rebuilding efforts in Jefferson County. In sum, Jefferson County employment rates appear to have recovered from Hurricane Rita.

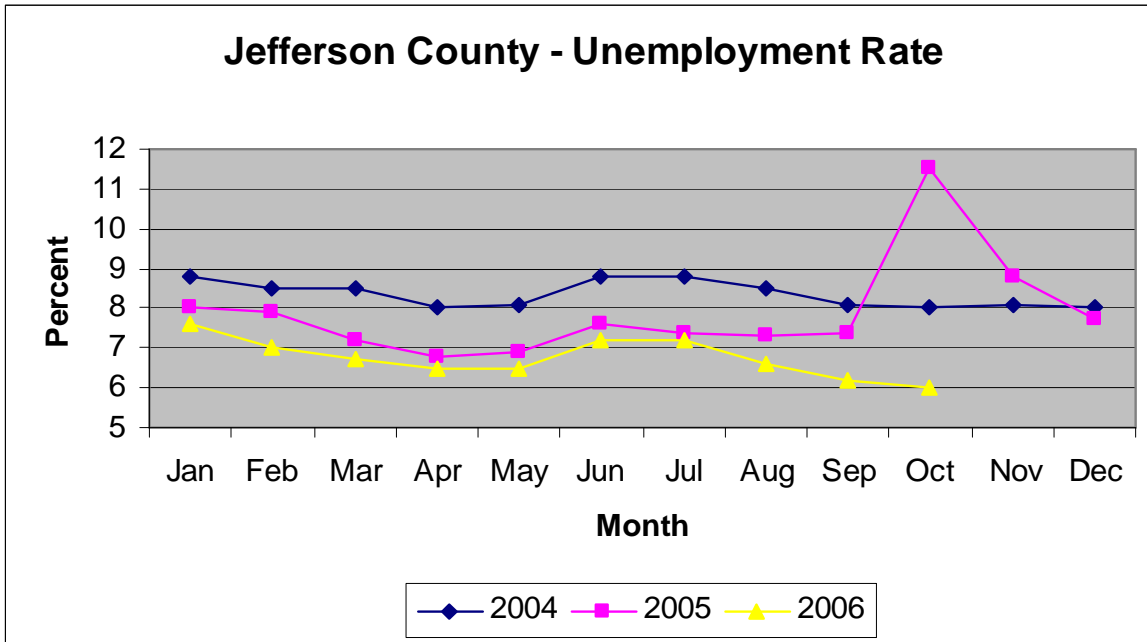


Figure 22. Monthly unemployment rates for Jefferson County, TX. 2004–2006.

5.10. Issues of Concern

Defined by its proximity to the Gulf of Mexico, large oil, gas, and refining operations, and limited population growth, Jefferson County’s revenue growth has been sluggish in recent years. Repeated budget deficits and an unemployment rate well above the comparable statewide figure are problems particularly acute in a county that has experienced only moderate growth over the last few decades. The county maintains no long-range strategic plans to guide operations and no comprehensive financial management strategy or long-term financial plan, but the county government recognizes that public policy is important to diversify and develop the economy. Given that the county is primarily reliant on a single industry, i.e., petrochemical refining, any problems in that area, or in the nation’s demand for oil and gas under variable economic conditions has a particularly negative effect that is not readily mitigated by alternate economic sectors (Commissioners Court, 2005).

6. PLAQUEMINES PARISH, LOUISIANA

6.1. Introduction

On August 29, 2005, Plaquemines Parish's world changed forever. Hurricane Katrina made landfall at Buras, located in the midsection of Plaquemines Parish. The eyewall winds (Figure 6, Section 3.3 above) and the storm surge covered the entire parish (Figure 5, Section 3.2 above). Most habitable land in the lower two-thirds of the parish borders both sides of the Mississippi River because of the river levees. Many of the communities are surrounded by "ring levees" to separate them from the surrounding marshlands. When the storm surge overtopped the levees, there was no way for the water to escape until heavy equipment could be brought in to make a cut in the levee to let the water drain out. This took weeks to happen. The entire infrastructure was destroyed and the citrus groves ruined (Kieper, 2006). Then, on September 24, 2005, Hurricane Rita's path tracked west of Plaquemines Parish but the winds and storm surge inflicted further damage (LS, 2006). Thus, the profile presents 2000 and 2005 economic data (where they exist) with the understanding that these data reflect the past and may have no relation with the current and future Plaquemines Parish.

Extending like a long, bony finger into the Gulf of Mexico, Plaquemines Parish is a relatively sparsely populated peninsula comprised of vast swampland and bisected by the Mississippi River. The parish encompasses 844 square miles of land area. The parish borders Jefferson Parish to the west and St. Bernard Parish to the north. The northwestern part of the parish is within the New Orleans-Metairie-Kenner, Louisiana Metropolitan Statistical Area (USDOC, Census, 2005f).

6.2. Built Environment

6.2.1. Human Geography/Population Centers

Pointe a la Hache, the parish seat, lies 38 miles southeast of New Orleans. It had a year 2000 population of 1,862 persons. Other large parish communities, with their corresponding year 2000 populations, include: Belle Chasse (9,848 residents), Buras-Triumph (3,358 residents), Port Sulphur (3,115 residents), Boothville-Venice (2,200 residents), and Empire (2,211 residents) (USDOC, Census, 2000c).

6.2.2. Transportation and Communication

State Road 23 runs the length of the parish on the western side of the Mississippi while State Road 39 runs on the eastern side as far as Venice. The New Orleans & Lower Coast railroad handles cargo into the parish; otherwise, the nearest railroad center is in New Orleans. The nearest bus station is the Greyhound station in New Orleans. The nearest major airports are New Orleans International and Lakefront Airport. There are also several small airstrips and heliports within the Parish that service industry and private planes (Plaquemines Parish, 2007). Port Eads, at the southernmost tip of the Mississippi delta was completely destroyed by Hurricane Katrina.

Regarding communication, two weekly newspapers circulate in the parish: The Plaquemines Gazette and The Plaquemines Watchman. No radio or television stations broadcast out of Plaquemines but seven television channels can be received from New Orleans without cable (Plaquemines Parish, 2007; Plaquemines Gazette, 2007).

6.2.3. Interaction between Built and Physical Environments

Plaquemines Parish is concerned about land loss and wetland loss (see Figure 23) in general and the relationship of these losses to the oil and gas industry’s digging of canals (Barras, 2006; USDOJ, USGS, 2003). Hurricane Katrina caused an estimated loss of 18 square miles of land (Barras, 2006).

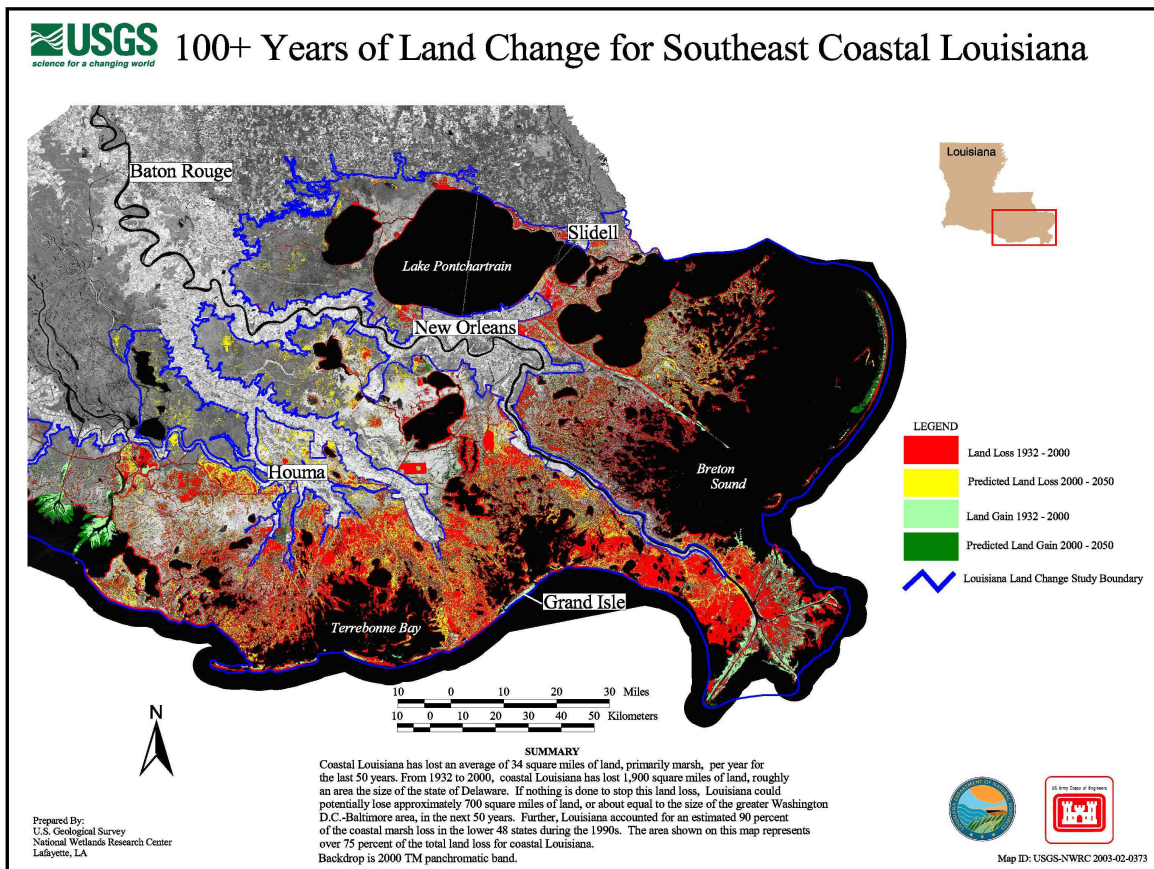


Figure 23. Land loss in southeastern Louisiana.

6.3 History

6.3.1. Settlement

Plaquemines derives its name from a Native Indian word “piakimin,” meaning persimmon. As its name implies, an abundance of persimmons are found in the area. The Tangipohoa and Quinipissa-Mugulasha people (part of the Muskogee nation) were among the first occupants of Plaquemines Parish. The neighboring Bayougoula Tribe’s people killed and dispersed the

Quinipissa-Mugulasha in 1700. The Houma later destroyed the Tangipohoa village upriver from the Quinipissa-Mugulasha village (IAI, 2004).

The Spanish expeditions of Luis de Moscoso in 1542 and the French expeditions of La Salle in 1682, of Iberville in 1699, and of Iberville and Bienville in 1700 opened the area to settlements. Plaquemines Parish was officially established in 1807 from the Orleans Territory. In 1810, the parish had 1,549 residents; by 1860 this figure had grown to 8,494 residents (IAI, 2004).

6.3.2. Industrialization

Plaquemines early economy revolved around the rice industry. Early settlers grew rice first for subsistence and, later, for trade. Rice patches were typically small, but prolific producers. In 1850, Plaquemines Parish harvested 35 percent of Louisiana's total rice product. Since the mid-18th century, Plaquemines Parish has been a key provider of fruits (especially citrus) and vegetables to the metropolitan area of New Orleans. The parish also produced indigo and sugar cane. Commercial fishing, particularly oystering and shrimping, also became an important contributor to the parish economy.

The Mississippi River served as the principle means of transportation prior to the arrival of the railroad. Plantation owners and small farmers alike utilized the great waterway to transport their goods. During the Civil War, Union troops also navigated up and down the River through the parish on strategic maneuvers.

In 1822, the government began constructing Fort Jackson, a fortification designed to protect the Mississippi from Spanish invasion. Although the fort was finished in 1832, it was primarily used as a prison after the Civil War and as a minor training base during World War I. Fort Jackson was declared a national historic monument, but was destroyed by Hurricane Katrina.

Oil, gas, sulfur, and fishing are the dominant industries in Plaquemines Parish. Indeed, these abundantly occurring natural resources have transformed Plaquemines into one of the wealthiest parishes in Louisiana. Sulfur was first found at Lake Washington and Grand Ecaille in 1932, and, within four years, was producing over a quarter of a million long tons annually. Freeport Exploration operates a large sulfur mine. Today, most people who live in the parish are employed by the seafood or oil industry. Chevron's Lube Oil Additive Plant, BP Oil's gasoline refinery, Petrotech, HBH, and Mosby Enterprises are among the major corporations located in Plaquemines Parish (IAI, 2004).

6.4. Demographic Characteristics

6.4.1. Population Growth

Plaquemines Parish's population in 2000 was approximately 26,000 people (USDOC, Census 2000c). By July 2004, the population had grown to 28,258 (Table 35) and remained steady for the next year. Between July 1, 2005 and January 1, 2006, however, Plaquemines Parish lost nearly 30 percent of its population due to Hurricane Katrina (USDOC, Census, 2006b).

Table 35

Population Changes, Plaquemines Parish: 2000 to 2006

Year	Population	Change From Previous Period	Percent Change From Previous Period
2000	26,757	--	--
July 1, 2004	28,258	1,501	5.61%
July 1, 2005	28,282	24	0.08%
January 1, 2006	20,164	-8,118	-28.70%

Source: USDOC, Census, 2006b.

6.4.2. Ethnicity and Age

In 2005, the population of Plaquemines Parish was 70 percent Caucasian, 23 percent African-American, three percent Asian, and two percent American Indian (Table 36). Hispanics may be of any race and so are included in applicable race categories. About 2.8 percent of the residents of Plaquemines Parish reported themselves as Hispanics (USDOC, Census, 2005f). Plaquemines is also an ethnically diverse parish; its residents include Acadian, Croatian, Creole, German, Filipino, Spanish, and Vietnamese inhabitants.

Table 36

Racial and Ethnic Populations, Plaquemines Parish: 2005

Race/Ethnicity	Percent
White	70.8%
African American	23.0%
Hispanic*	2.8%
American Indian	2.0%
Asian	3.3%
Pacific Islander	0.0%
Two or More Races	0.9%

* Hispanics may be of any race.

Source: USDOC, Census, 2005f.

Figure 24 is an overlay of the 2000 Census data with the OCS-related infrastructure. The Census variable is the percent of the black population by block group. The large amount of gray area in the figure is due to fewer than 100 persons living in a block group. There is an area on the north side of the Mississippi River where the blacks form more than 75 percent of the population. On the south side of the river, there is a larger area where blacks form from 51 percent to 75 percent of the population. There is no visual correlation between the concentration of black population and OCS-related infrastructure.

American Community Survey data for Plaquemines Parish are not available for 2002-2005. According to 2000 Census data, the population of Plaquemines Parish is somewhat younger than the nation as a whole. The median age for Plaquemines Parish is 33.7 years compared to the national value of 35.3 years. About 7.8 percent of the population for Plaquemines Parish is under five years of age, compared to the national value of 6.8 percent. Only 9.8 percent of the population was 65 years or older in the parish compared to 12.4 percent for the nation (USDOC, Census, 2000c).

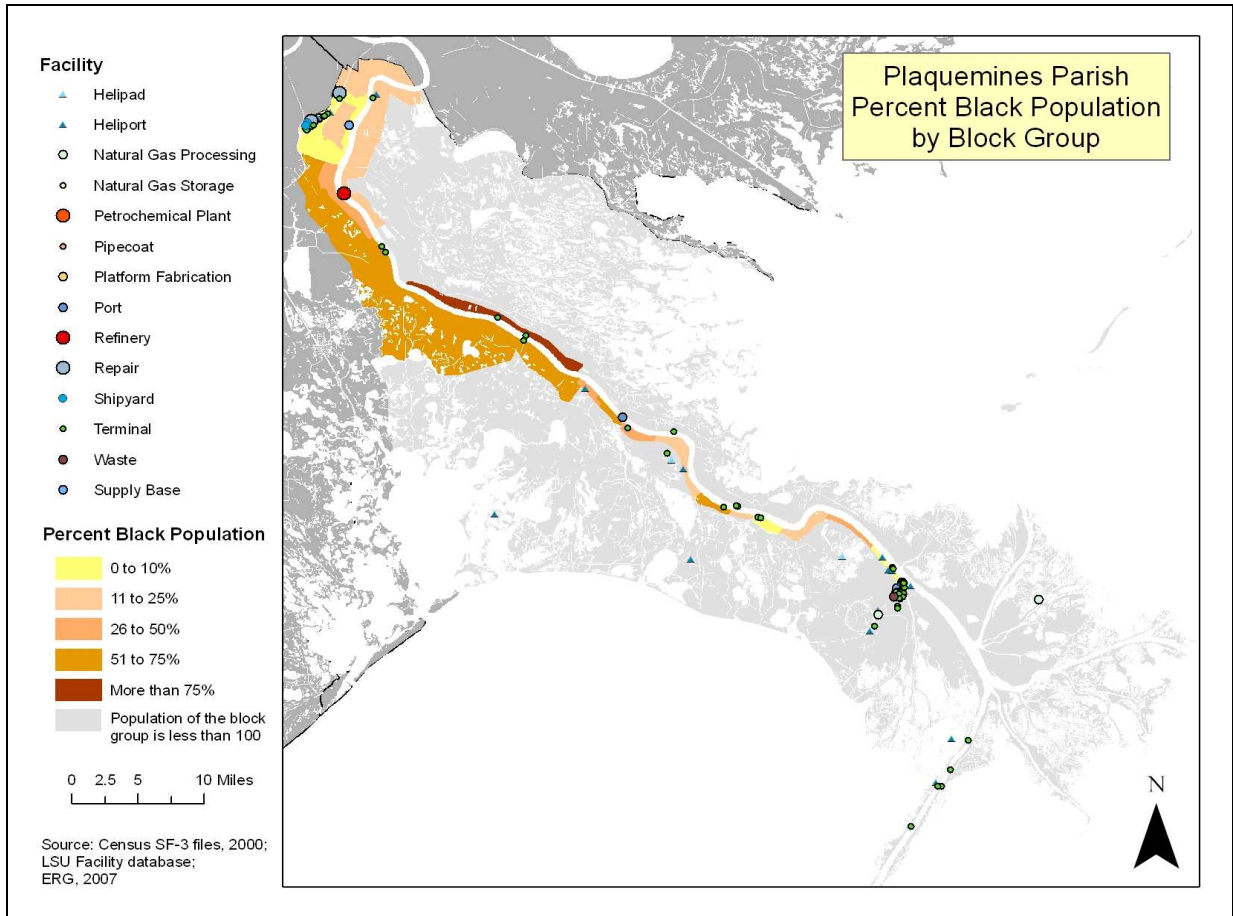


Figure 24. Plaquemines Parish—percent black population by block group.

6.5. Economy

6.5.1. Income and Poverty

Figure 25 is an overlay of the 2000 Census data with the OCS-related infrastructure. The Census variable is the percent of the population with income lower than the national poverty level. There is a broad swath along the Mississippi River where the percentage of the population below the poverty level ranges from 26 percent to 50 percent. However, the OCS-related infrastructure appears to be concentrated in areas with lower proportions of poverty.

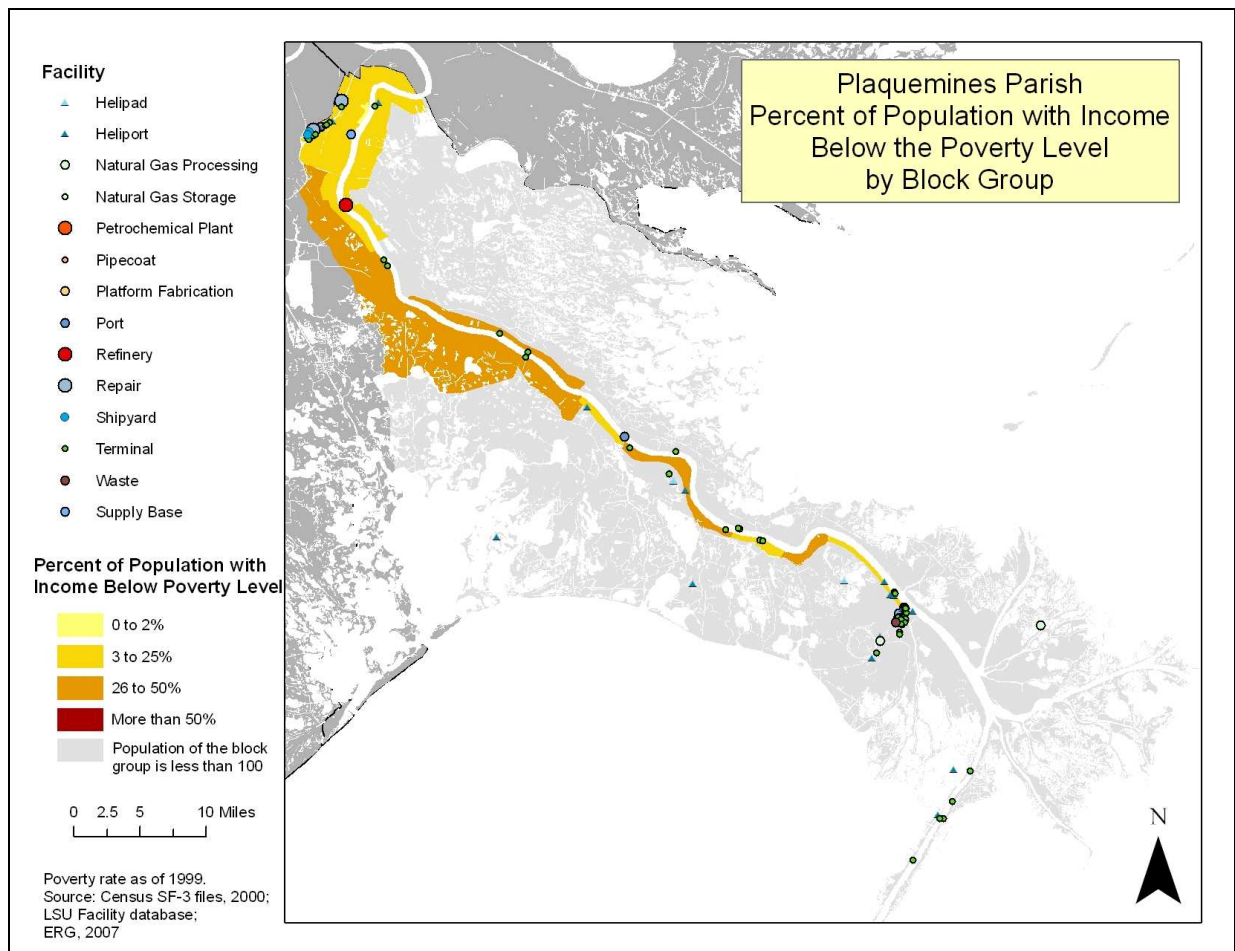


Figure 25. Plaquemines Parish—percent of population with income below poverty level by block group.

6.5.2. Employment and Industry

Table 37 summarizes the employment in major industrial sectors in 2000. Table 38 summarizes the earnings by major industrial sector. The major sectors are government (21 percent), manufacturing (18 percent), mining (15 percent), nondurable good manufacturing including food and chemicals (12 percent), and transportation (12 percent). A closer inspection of the numbers shows the importance of water transportation (\$31 million) and the lack of transit and ground passenger transportation (\$0).

Table 37

Employment in Major Industrial Sectors, Plaquemines Parish: 2000

Year	Agric., Fishing & Forestry	Mining	Constr.	Manuf.	Trans., Comm.& Public Util.	Wholesale & Retail Trade	Finance, Insur., And Real Estate	Services	Public Admin.
Workers in sector									
2000	516	695	715	899	928	1,419	409	3,589	790
Percent of workers in sector									
2000	5.1%	7.0%	9.0%	9.0%	9.3%	14.3%	4.1%	36%	7.9%

Source: USDOC, Census, 2000c.

Table 38**Compensation by Industry, Plaquemines Parish: 2001-2005**

Industry	Year					2005
	2001	2002	2003	2004	2005	Percent
Compensation of employees	\$802,511	\$793,738	\$823,284	\$849,042	\$891,881	100%
Forestry, fishing, related activities, and other	\$665	\$651	\$843	\$671	\$664	0%
Mining	\$116,037	\$112,462	\$134,714	\$129,060	\$129,367	15%
Manufacturing	\$122,039	\$160,765	\$141,801	\$147,887	\$160,260	18%
Fabricated metal product	\$3,674	\$3,354	\$3,133	\$3,045	\$2,981	
Machinery	\$20,693	\$15,734	\$10,237	\$11,042	\$12,016	
Computer and electronic	\$16,014	\$12,373	\$13,925	\$13,504	\$14,843	
Other transportation equipment	\$19,046	\$20,643	\$14,494	\$11,816	(D)	
Nondurable goods manufacturing	\$51,863	\$99,385	\$90,558	\$98,896	\$107,819	12%
Food manufacturing	\$11,214	\$13,846	\$13,772	\$13,726	\$10,754	
Chemical manufacturing	\$38,861	\$44,661	\$37,550	\$39,953	\$46,531	
Wholesale trade	\$36,869	\$41,967	\$36,912	\$36,560	\$37,358	4%
Transportation and warehousing	\$122,093	\$100,570	\$96,117	\$97,536	\$105,538	12%
Air transportation	\$11,528	\$11,629	\$11,554	\$8,960	\$13,975	
Rail transportation	\$341	\$326	\$304	\$422	\$427	
Water transportation	\$39,115	\$31,629	\$29,592	\$28,505	\$31,040	
Truck transportation	\$5,315	\$4,283	\$4,332	\$4,748	\$4,895	
Transit and ground passenger transportation	\$0	\$0	\$0	\$0	\$0	
Pipeline transportation	\$8,178	\$6,523	\$6,595	\$5,696	(D)	
Scenic and sightseeing transportation	\$374	\$390	\$553	(D)	\$427	
Support activities for transportation	\$53,872	\$42,310	\$39,513	\$44,748	\$44,827	
Finance and insurance	\$5,496	\$4,669	\$4,701	\$5,030	\$4,898	1%
Real estate and rental and leasing	\$28,738	\$24,094	\$28,214	\$30,924	\$31,157	3%
Professional and technical services	\$18,557	(D)	(D)	(D)	(D)	
Accommodation and food services	\$25,561	\$22,564	\$22,596	\$23,005	\$20,864	2%
Other services, except public administration	\$15,600	\$16,155	\$17,178	\$18,388	\$17,774	2%
Government and government enterprises	\$142,032	\$156,638	\$168,890	\$169,177	\$185,239	21%
Federal, civilian	\$36,576	\$38,138	\$38,646	\$35,512	\$35,671	
Military	\$35,266	\$39,132	\$41,817	\$40,576	\$51,184	
State and local	\$70,190	\$79,368	\$88,427	\$93,089	\$98,384	

Source: USDOC, BEA, 2005.

The unemployment rate for Plaquemines Parish was 5.1 percent in 2004. The monthly data for January 2005 through August 2005 ranges from 4.0 percent to 6.0 percent. A Bureau of Labor Statistics report reports a 15 percent loss in employment from September 2004 to September 2005 (see Figure 26, taken from Garber et al., 2006). A measure of the devastation caused by Hurricane Katrina is that—as of January 2007—the Bureau of Labor Statistics, Local Area Unemployment Statistics database does not report unemployment rates, employment rates, or labor force for Plaquemines Parish as of September 2005 (USDOL, BLS, 2007c).

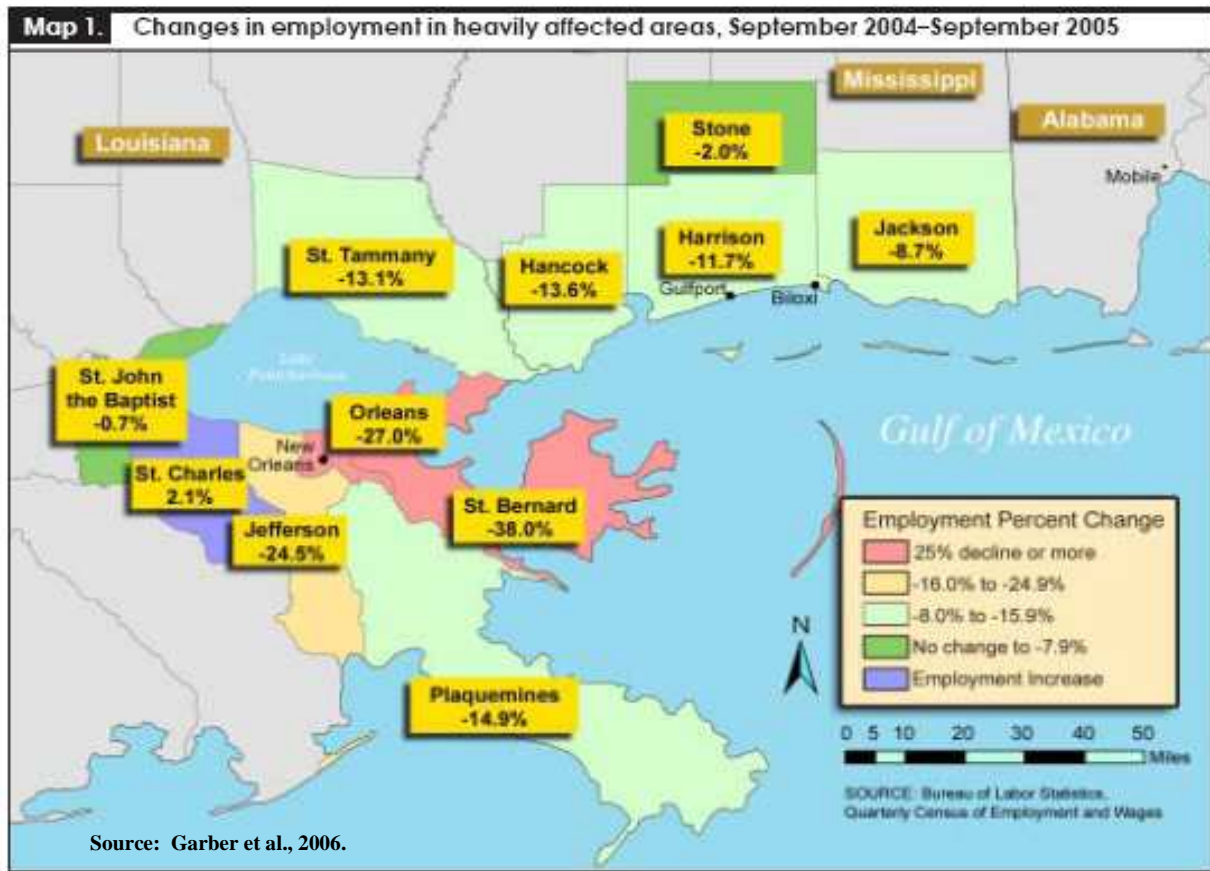


Figure 26. Gulf area changes in employment, September 2004 to September 2005.

6.5.3. Wages

In 2003, the median household income (MHI) for Plaquemines Parish was \$38,329 and for Louisiana was \$33,792 (USDOC, Census, 2005f). That is, Plaquemines had a higher MHI than the rest of the state. American Community Survey data for 2005 are not available for Plaquemines Parish. Garber et al. (2006) notes that the average weekly wage in the parish went from \$836 in the third quarter of 2005 to \$928 in the fourth quarter of 2005. The authors interpret the data to indicate that a larger proportion of the jobs lost were in lower-paying positions.

6.5.4. Marine-Based Activities

Surrounded by the Gulf of Mexico, marine-based activities have long since played an important role in the parish's history. In 2004, the Empire-Venice area of Plaquemines declared 397 million pounds in fishery landings totaling \$60.2 million in value. In contrast, the 2005 landings at the same port totaled only 171 million pounds at a value of \$39.4 million (USDOC, NMFS, 2007). Two major events have helped the industry survive and begin to recover. First, the city of Valdez, Alaska sent a Marine Travelift, a mobile hoist capable of lifting 60 tons. This permits the damaged vessels to be repaired and placed back in service. Second, the Shell Oil Company donated \$500,000 to purchase three ice machines for the area. Plaquemines and St. Bernard pooled their funds to develop one ice station hub for the region (LSU, AgCenter, 2006).

Recreational anglers spent \$895 million in Louisiana in 2003 (LSU, AgCenter, 2005). Isaacs and Chi (2006) estimate that two fishing rodeos in Plaquemines Parish contributed \$140 thousand to \$450 thousand to the local economy.

6.5.5. Military Installations

An Aid to Navigation Teams Station, and a Search and Rescue Station of the U.S. Coast Guard are located in Venice. The U.S. Coast Guard also has facilities in Belle Chasse. The Naval Air Station-Joint Reserve Base is located in Belle Chasse. It contains all five branches of the U.S. Armed Forces (GlobalSecurity.org, 2007a).

6.5.6. Tourism

While the parish is extremely beautiful and close to New Orleans, tourist attractions are comparatively limited. The major attraction, Fort Jackson, is a historical site dating back to 1832 and this was destroyed by Hurricane Katrina (Plaquemines Parish, 2007).

6.6. Local Government

The legislature for the Parish of Plaquemines consists of a "President-Council" form of government. The Parish President is elected parish-wide for a four-year term. The Parish Council is composed of nine (9) members elected from single-member districts for four-year terms. The President and Council Members are sanctioned under term limits, restricting them to serving (if re-elected) two consecutive four-year terms. The Sheriff's Office handles all criminal, civil, and tax operations and police protection. Nine fire stations provided fire protection to the parish (Plaquemines Parish, 2007). In December 2005, Moody's downgraded Plaquemines Parish's bond rating from A3 to Ba2 (Trotter, 2006).

6.7. Social Context

6.7.1. Education

Plaquemines Parish has nine schools, six of which were severely damaged by Hurricane Katrina. The School Board encouraged all students from the parish to enroll in the school system

wherever they relocated and registered other students for homeschooling. Schools did not reopen until January 2006; the three schools in Belle Chasse were opened to all students in the parish (PPSB, 2006). ConocoPhillips donated \$1 million dollars to the Plaquemines Parish School District in mid-2006 (ConocoPhillips, 2006a).

Figure 27 is an overlay of the 2000 Census educational level by block groups with OCS-related infrastructure. In most of the parish, less than 10 percent of the population finished college. The exception is in the northern part, nearer to New Orleans, where 10 to 20 percent of the population finished college.

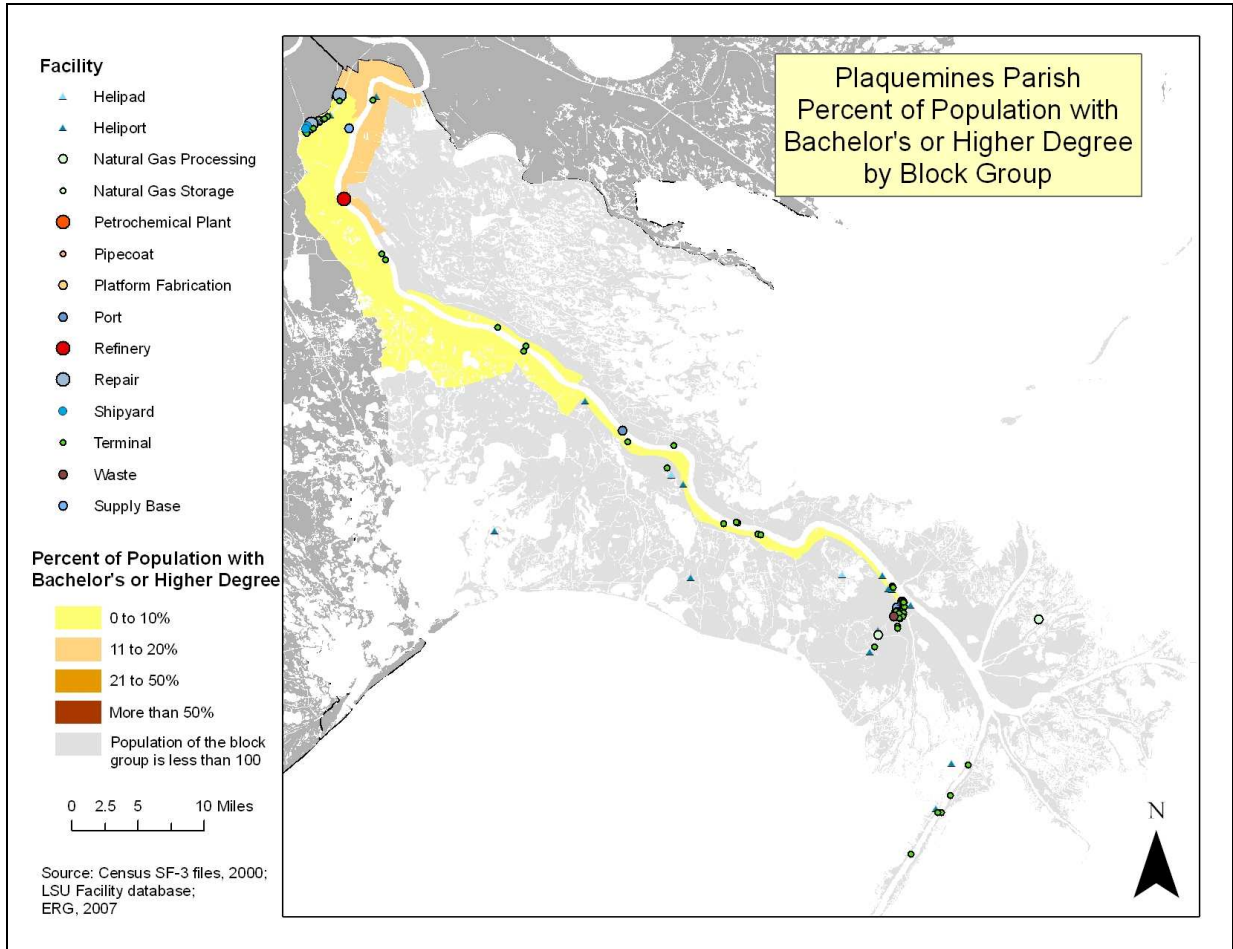


Figure 27. Plaquemines Parish—percentage of population with bachelor's or higher degree by block group.

6.7.2. Health and Welfare

With a few exceptions, Plaquemines performs well on many indicators of health care provision. The exceptions include its classification as a medically underserved area—the parish has only one hospital (200 beds) and one nursing home (120 beds) (LDHH, 2006).

6.7.3. Recreation

Plaquemines Parish is home to the Delta National Wildlife Refuge and the Breton National Wildlife Refuge (USDOJ, USFWS, 2006b and 2007). Recreational facilities include recreational centers, tennis courts, a museum, ball fields, country clubs, and auditoriums. Fishing and hunting are popular in the parish. Fort Jackson, a historical site, was destroyed by Hurricane Katrina (Plaquemines Parish, 2007). Recreational fishing has made a decent comeback after the hurricanes (LSU, AgCenter, 2006). ConocoPhillips donated \$5 million dollars to build a community center in Plaquemines Parish (ConocoPhillips, 2006a).

6.7.4. Religion

Church-going and related activities are important to community life in Plaquemines Parish. In 2000, 15,045 parish residents claimed a religious affiliation: 80 percent Catholic, 14 percent Baptist, and six percent “other” (ARDA, 2006e).

6.8. Impacts from Hurricane Katrina and OCS-Related Infrastructure

Plaquemines Parish ranks 5th in terms of concentration of OCS-related infrastructure with:

- 1 refinery
- 72 terminals
- 1 port
- 2 shipyards
- 2 ship repair facilities
- 5 supply bases
- 2 platform fabricating facilities
- 2 natural gas processing facilities
- 1 waste facility
- 19 heliports/helipads

ConocoPhillips’ Alliance refinery in Belle Chasses was shut down prior to Hurricane Katrina’s arrival. It took until late January 2006 to repair the damage to allow partial operation. The plant did not return to full operation until mid-April (ConocoPhillips, 2006b and 2006c).

ChevronTexaco moved its operations to Theodore, Alabama while repairs were made to the terminal in Venice, Louisiana through which one-quarter of all Gulf of Mexico oil moved. Chevron provided barges on the Mississippi to house its workers and flew workers and equipment in from Leeville to repair the plant. By October 11, 2005, crude began flowing from the terminal and by November 6, 2005, two of the 11 storage tanks were operating (ChevronTexaco, 2005; Fowler, 2005).

As of January 2006, the Department of Energy reported that a small number of gas processing plants with capacities of 100 million cubic feet per day were not active. The plants had an aggregate capacity of 3.25 billion cubic feet per day but, prior to Hurricane Katrina, had an

average utilization rate of about 65 percent. All other processing plants appear to be back in operation (USDOE, OE, 2006).

6.9. Issues of Concern

The issues of concern are the recovery from Hurricane Katrina and continuing coastal erosion (Barras et al., 2004).

7. JEFFERSON PARISH, LOUISIANA

7.1. Introduction

Jefferson Parish is a long and narrow strip of land and water in southeast Louisiana. Orleans and Plaquemines Parishes border Jefferson on the east, Lafourche and St. Charles Parishes on the west, and by the Gulf of Mexico on the south. The Mississippi River bisects the parish, with Lake Pontchartrain forming its northern boundary and Barataria Bay defining its southern boundary.

In the north, Jefferson Parish appears to cradle New Orleans with its fingers stretching to Lake Pontchartrain on the west while the thumb curls along the east bank of the river. This region is urban, serves as a suburb of New Orleans, and is included in the Census's New Orleans-Metairie-Kenner, LA Metropolitan Statistical Area.

The parish's southern Barataria region is relatively rural, consisting largely of bayous, swamps, and coastal marshes. Jefferson Parish encompasses 306 square miles of land (USDOC, Census, 2005d) and a comparable area of water. Fort Livingston and Fort Pike State Parks are located on the barrier islands in the Gulf, while Bayou Segnette State Park and a portion of Jean Lafitte National Historical Park are found in the northern part of the parish.

On August 26, 2005, the Jefferson Parish President issued a mandatory evacuation order ahead of Hurricane Katrina's landfall. Water overtopping the Lake Pontchartrain levees resulted in the flooding of the northernmost section of the parish, including "Old Metairie," but the levees held (unlike those in the neighboring parish of Orleans). The Parish President further issued a "lock out" order for the parish until September 5th to facilitate cleanup and restoration of utilities and services (Levin and Eisler, 2005; LS, 2007; Jefferson Parish, 2005a). Later that month, he had to order a mandatory evacuation for Jean Lafitte, Crown Point, Barataria, and Grand Isle in advance of Hurricane Rita (Jefferson Parish, 2005b). Jefferson Parish sustained substantial damage but fared better than the neighboring parishes of Orleans, Plaquemines, and St. Bernard (LS, 2007).

7.2. Built Environment

7.2.1. Human Geography/Population Centers

Metairie is the largest population center in the parish with a 2005 population of about 133,000 people (USDOC, Census, 2005d). Gretna, the parish seat, had a year 2000 population of 17,423 residents, and is located eleven miles from New Orleans. Other major population centers in Jefferson Parish include: Grand Isle (1,541), Harahan (9,885), Jean Lafitte (2,137), Kenner (70,517), and Westwego (10,763) (USDOC, Census, 2000a; 2005 data from Census' American Community Survey are not available for these geographies).

7.2.2. Transportation and Communication

Interstate 10 and U.S. Highways 90 and 61 serve as the parish's main thoroughfares. Louisiana Highways 18, 45, and 3134 also facilitate road travel through the parish. The Canadian National

Railway, Rio Grande Pacific (New Orleans & Lower Coast), and Union Pacific railroads all serve the parish's freight needs. However, there are no motor freight terminal facilities located in the parish (Rio Grande Pacific Corporation, 2007; Union Pacific, 2007). Amtrak offers passenger rail service out of New Orleans, but service to the east (e.g., to Biloxi, Mississippi) is suspended due to damage from Hurricane Katrina (Amtrak, 2009). Jefferson Parish hosts the Louis Armstrong New Orleans International Airport, located 13 miles from Gretna.

Jefferson Parish (Gretna) is located only eleven miles from the deepwater Port of New Orleans. This port is one of the U.S.'s largest deepwater ports. It offers 22 miles of river coverage for cargo handling area and more than six million square feet of covered storage area. It is also a leading importer of steel, natural rubber, plywood, and coffee. The Union Pacific Railroad and various truck lines link Jefferson Parish to the port (Port of New Orleans, 2007).

Regarding communication, the parish circulates one daily (The Times-Picayune) and one weekly (City Business) newspaper. No television or radio stations broadcast from within the parish.

7.2.3. Physical Infrastructure

Jefferson Parish provides water to Metairie, Kenner, Marrero, Terry, Harvey, and Gretna; it also supplies sewer services to Metairie, Marrero, Terry, and Harvey. The municipalities provide sewer services to Kenner and Gretna. Electricity is available through Entergy, and Atmos Energy LA offers natural gas (Entergy, 2007a).

7.2.4. Interaction between Built and Physical Environments

The parish is concerned about land loss and wetland loss (see Figure 23, Section 6.2.3) in general and the relationship of these losses to the oil and gas industry's digging of canals (Barras, 2006; Barras et al., 2004). Hurricanes Katrina and Rita caused an estimated loss of 10 to 20 square miles of land (LS, 2007).

7.3. History

7.3.1. Settlement

Jefferson Parish's prehistory dates back to 500 B.C. (roughly the Tchefuncte Period). Characterized by the "first extensive use of ceramics" and the planting of maize and squash, the Tchefuncte culture is defined as "the local manifestation of the general southeastern U.S. cultural period known as Early Woodland." This Archaic culture had a subsistence based largely on shellfish gathering/hunting from the marshes and swamps. And while the use of pottery was extensive, the craftsmanship was rather crude.

The Marksville culture followed the Tchefuncte, with more complex ceramics. Seafood-gathering remained essential, and hunters employed spears. The bow and arrow did not appear until the Troyville Period. The Coles Creek people followed the Troyville period. The Plaquemine Period which follows Coles Creek is characterized by large ceremonial centers, more complex pottery, and rectangular, rather than round, houses. Still in Jefferson Parish,

cultural remains are few. Later, the Colapissa (or Acolapissa) tribe settled on the Mississippi River's east bank in present day Jefferson Parish, while the Washa (Ouacha) settled on the west bank.

Jefferson Parish was formed in 1807 when the Orleans territory was divided. Named for Thomas Jefferson, it was organized in 1825. As Orleans Parish grew, it annexed much of Jefferson. Jefferson Parish's present day boundaries were set in 1874. French, Spanish, and Acadian homesteaders were among the region's earliest European settlers (IAI, 2004).

7.3.2. Industrialization

Through the 1800s, Jefferson Parish was largely an agricultural center, with some wooded areas reserved for hunting and bayous reserved for fishing. Sugar was the staple crop of the parish, creating great wealth for many of its planters. Plantation homes and sugar mills thrived during the Antebellum Period. By 1834, the parish had three active sugarhouses on its east bank and eight on its west. As with other plantations across the state, those in Jefferson Parish provided not only a staple economy but also basic subsistence: rice, corn, vegetables, potatoes, and fruits were also grown and livestock were raised.

The steamboat and, later, the railroad ushered into Jefferson Parish a lively new era of improved transportation, trade, and communication. By 1861, the Jefferson and Lake Pontchartrain and the New Orleans, Jackson & Great Northern railroads were essential in connecting Jefferson's two major communities, Kenner and Carrollton, to the northern and western parts of the state.

The Civil War not only interrupted the parish economy, it served as a point of transition. New Orleans surrendered to federal troops, and so plantations in its vicinity escaped relatively unscathed. While planters faced great loss, the plantation economy survived such that, in 1881, the parish housed more than 60 plantations and 30 producing sugarhouses.

In the late 1800s, processing factories, centered on agricultural-based products, were introduced to the parish. John Stumpf's and Sons Insecticides, established in 1876, and the Southern Cotton Oil Company, established in 1887, were the parish's first factories. The latter plant still continues operations today as "Hunt Foods." By 1890, Gretna had grown into a "manufacturing town" with a population of 5,425. Jefferson Parish's manufacturing boom continued as the Seaboard Refining Company set up shop in Gretna in 1902, the Penick and Ford Syrup Company in Marrero in 1910, the American Molasses Company in Gretna in 1929, and the Celotex plant in Marrero in 1939. In the latter half of the 20th century, numerous canning operations, distilleries, shell fish processing plants, trading and import companies, refineries, fertilizer plants, lumber companies, and marine product companies established plants in this parish. While the increase of factories brought wealth and population growth to Jefferson Parish, the parish's growth spiked significantly with the Texas Company's discovery of oil in the "Dupre Cut" in Lafitte in 1935. Indeed, parish population increased by 106 percent between 1940 and 1950. As of 2001, there were approximately 2,700 oil wells in Jefferson Parish. In the 1950s and 60s, many middle class families moved to the parish, suburbanizing the region and making it one of the fastest growing areas in the country (IAI, 2004; Jefferson Parish, 2007).

7.4. Demographic Characteristics

7.4.1. Population Growth

The Jefferson Parish population was 455,466 in 2000, making it the second most populous parish in the state, after its neighbor, Orleans. The parish's population history in the 20th century falls into two distinct periods: before and after 1980. Pre-1980, Jefferson was among the most rapidly growing parishes in the state. During the period from 1940 to 1980, it grew from 50,000 to 455,000 persons, capturing the largest portion of suburbanized growth in the New Orleans metropolitan area (Table 39). During this period, northern Jefferson Parish transformed into a highly urban environment, and outgrew its designation as a New Orleans "bedroom" community. After the 1980s, however, Jefferson experienced a net out-migration of 52,000 residents, nearly 12 percent of its 1990 population. By 2000, the Jefferson Parish population had once again increased (USDOC, Census, 2000a).

Table 40 tracks the population changes in Jefferson Parish from 2000 and through Hurricanes Katrina and Rita. Jefferson's population in 2000 was approximately 455,000 people (USDOC, Census, 2000a). By July 2004, the population had shrunk slightly to about 449,000 and remained steady for the next year. Between July 1, 2005 and January 1, 2006, Jefferson Parish lost nearly 8.3 percent of its population due to Hurricane Katrina. The population loss, although significant is not as severe as that in the neighboring parishes of Orleans, Plaquemines, and St. Bernard (USDOC, Census, 2006b).

Table 39

Population Changes, Jefferson Parish: 1920 to 2000

Year	Population	Rank in State	Change From Previous Census	Percent Change From Previous Census	Rank in Growth Rate	Net Migration Since Previous Census
2000	455,466	2	7,160	1.6%	46	-
1990	448,306	2	-6,286	-1.4%	32	-51,753
1980	454,592	2	117,024	34.7%	6	65,612
1970	337,568	2	128,799	61.7%	3	79,749
1960	208,769	4	104,896	101.0%	2	67,711
1950	103,873	4	53,446	106.0%	1	-
1940	50,427	8	10,395	26.0%	7	-
1930	40,032	9	18,469	85.7%	1	-
1920	21,563	29	-	-	-	-

Source: USDOC, Census, 2000a.

Table 40

Population Changes, Jefferson Parish: 2000 to 2006

Year	Population	Change From Previous Period	Percent Change From Previous Period
2000	455,466	--	--
July 1, 2004	448,843	-6,623	-1.45%
July 1, 2005	448,578	-265	-0.06%
January 1, 2006	411,305	-37,273	-8.31%

Source: USDOC, Census, 2006b.

7.4.2. Ethnicity and Age

In 2005, the population of Jefferson Parish was 68 percent Caucasian, 27 percent African-American, and three percent Asian (Table 41) Hispanics may be of any race and so are included in applicable race categories. About 8.1 percent of the residents of Jefferson Parish reported themselves as Hispanics. Slightly more than one percent of the population reported themselves as two or more races (USDOC, Census, 2005d).

Table 41

Racial and Ethnic Populations, Jefferson Parish: 2005

Race/Ethnicity	Percent
White	68.2%
African American	26.8%
Hispanic*	8.1%
American Indian	0.4%
Asian	3.4%
Pacific Islander	0.0%
Two or More Races	1.2%

* Hispanics may be of any race.

Source: USDOC, Census, 2005d.

Figure 28 is an overlay of the 2000 Census data with the OCS-related infrastructure. The Census variable is the percent of the black population by block group. The large amount of gray area in the figure is due to fewer than 100 persons living in a block group. The urban area in the north is evident, as is the sparse population in the southern section of the parish. Grand Isle is visible at the southern border of the parish. Figure 29 is a larger-scale view of the part of Jefferson parish that borders on New Orleans/Orleans Parish. There are approximately a dozen areas where blacks form more than 75 percent of the population. There is a visual correlation between the concentration of black population and OCS-related infrastructure along the Harvey canal.

The median age for Jefferson Parish ranged from 37.1 years to 42.0 years for the two parts of 2005 (USDOC, Census, 2006c).

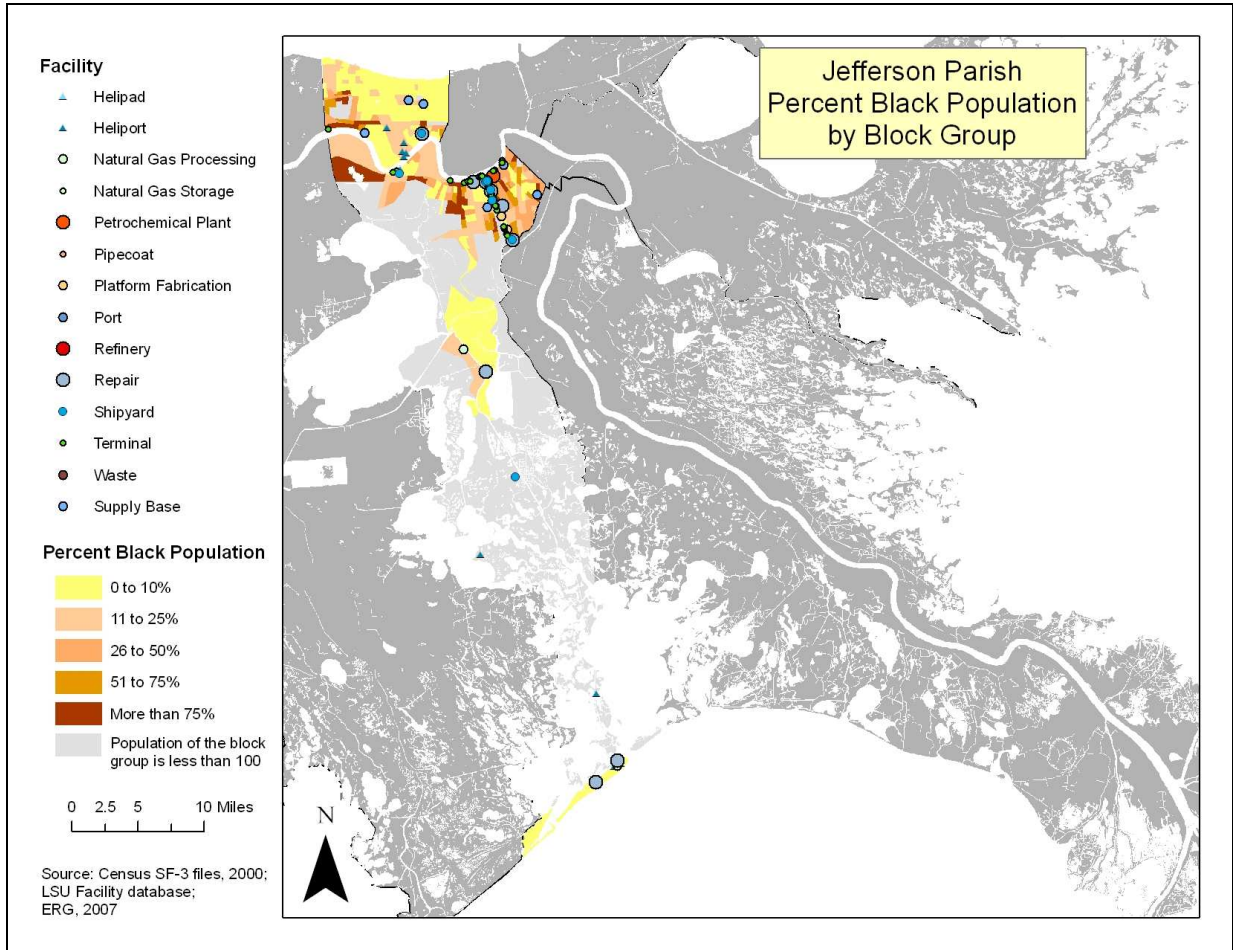


Figure 28. Jefferson Parish, LA —percent black population by block group, 2000 data.

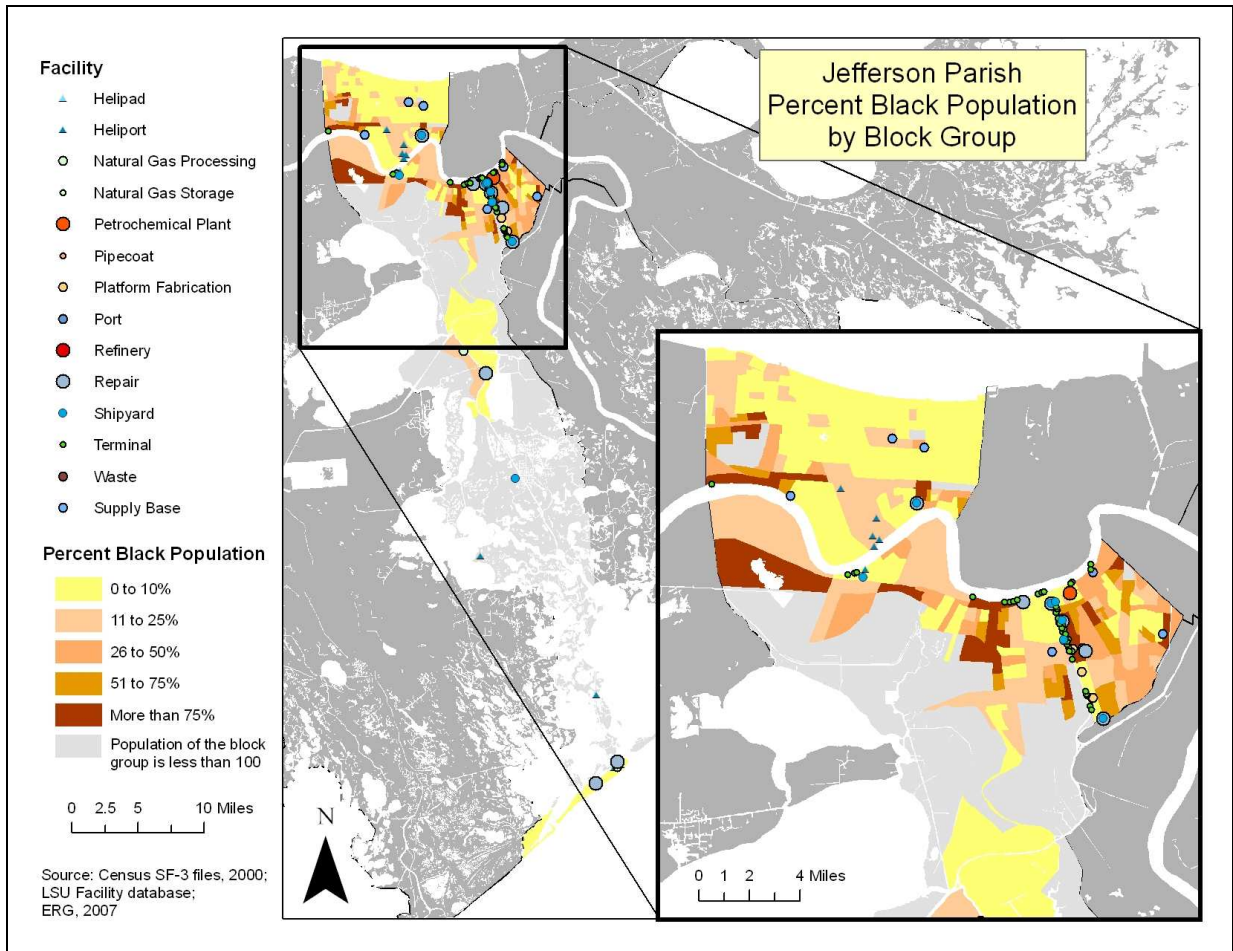


Figure 29. Jefferson Parish, LA inset—percent black population by block group.

7.5. Economy

7.5.1. Income and Poverty

Table 42 tracks Jefferson Parish’s income and poverty data from 1950 through 2000. In 2005 from January through August, the median income of families in Jefferson Parish was \$44,142 while for September through December it was \$37,615 (USDOC, Census, 2006c). In nominal dollars, median family income in Jefferson peaked in 1980 although it was strongest in 1960 when it represented 142 percent of the state median. Between 1980 and 1990, median family income declined by 13 percent. Still, this decline was less than declines experienced by other parishes during this decade when the oil industry bottomed out.

From January through August 2005, 17.5 percent of families with children under the age of 18 had incomes below the poverty level. From September through December, the percentage declined slightly to 15.4 percent (USDOC, Census, 2006c).

Table 42

Income, Poverty and Family Structure, Jefferson Parish: 1950-2000

Year	Median Family Income (2000 Constant \$)	Change From Previous Census	Ratio to State Median	Ratio of Income at 80 th and 20 th Percentile	Persons in Poverty	Persons Receiving Public Assistance	Female-Headed Families with Children
2000	\$45,834	2.0%	1.15	-	14%	3%*	22%
1990	\$45,068	-13.4%	1.23	3.48	14%	6%	20%
1980	\$52,016	8.3%	1.21	3.36	9%	6%	14%
1970	\$48,044	34.2%	1.36	2.52	10%	5%	7%
1960	\$35,802	67.5%	1.42	2.63	-	-	-
1950	\$21,370	-	1.39	3.17	-	-	-

Source: USDOC, Census, 2000a.

* Calculations provided by the U.S. Bureau of Census for 2000 are for “households” rather than “persons” receiving assistance.

Figures 30 and 31 overlay the OCS-related infrastructure with the percentage of the population with income below the poverty level by Census block group. There are about five areas where more than half the population has an income below the poverty level and these are clustered in the northern part of the parish. There is not much visual correlation between areas of high poverty and OCS infrastructure with the possible exception of the repair facility to the west of New Orleans.

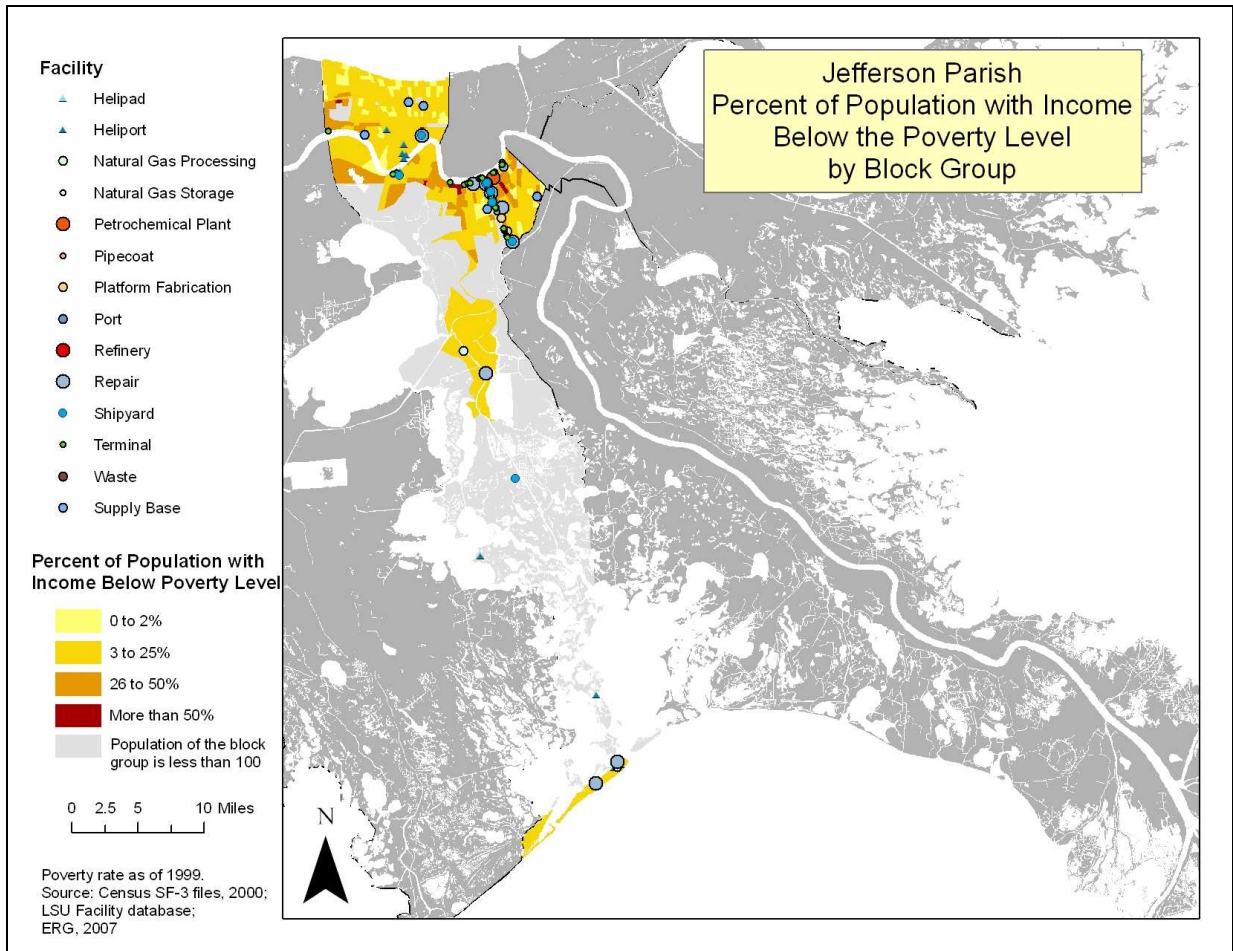


Figure 30. Jefferson Parish—percent of population with income below poverty level.

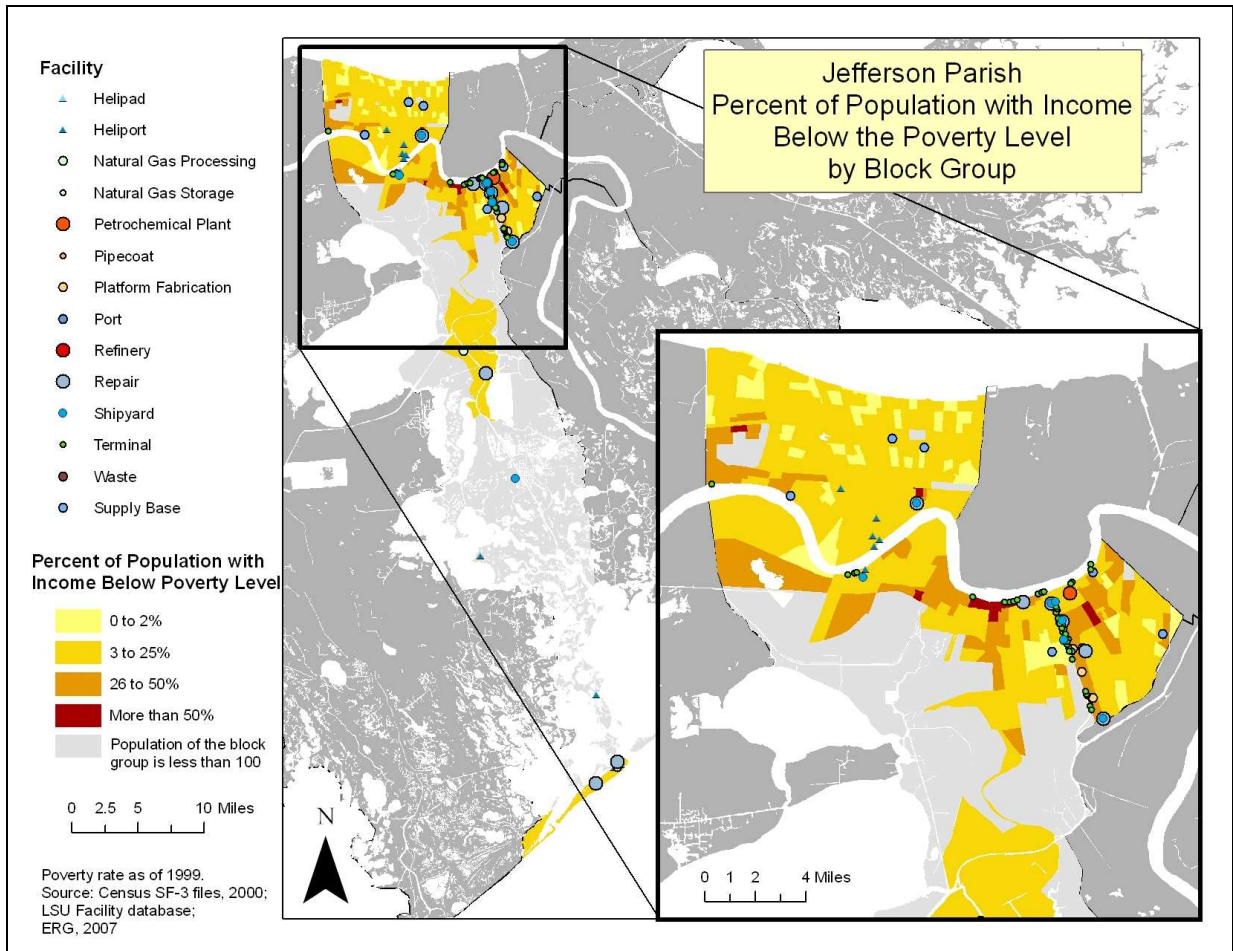


Figure 31. Jefferson Parish inset—percent of population with income below poverty level.

7.5.2. Employment

Between 1940 and 1980, employment of Jefferson Parish residents increased in all sectors except agriculture, fisheries, and forestry. Employment increases reflect in part the in-migration of workers who commute to Jefferson Parish from other parishes. Between 1940 and 1970, manufacturing was the parish's leading employment sector. After 1970, employment in the services and wholesale and retail trade sectors began rising (see Table 43).

Table 43**Employment in Major Industrial Sectors, Jefferson Parish: 1940-2000**

Year	Agric., Fishing & Forestry	Mining	Constr.	Manuf.	Trans., Comm.& Public Util.	Wholesale & Retail Trade	Finance, Insur., and Real Estate	Services	Public Admin.
Workers in sector									
2000	1,005	3,054	16,353	17,663	17,196	35,623	14,636	96,248	10,699
1990	2,069	4,449	12,613	20,253	19,532	52,989	16,185	69,849	9,540
1980	1,536	8,045	20,235	24,023	24,732	50,685	13,518	53,856	9,357
1970	1,129	4,810	10,608	19,323	14,231	29,780	7,469	29,198	5,797
1960	850	2,956	6,322	14,587	8,512	15,300	3,556	13,136	3,011
1950	1,001	1,017	3,054	8,765	5,140	7,947	1,096	5,704	1,399
1940	1,765	130	1,136	5,573	1,852	2,739	369	2,496	430
Percent of workers in sector									
2000	0.5%	1.4%	7.7%	8.3%	8.1%	16.8%	6.9%	45.3%	5.0%
1990	1.0%	2.1%	6.1%	9.8%	9.4%	25.5%	7.8%	33.7%	4.6%
1980	0.7%	3.9%	9.8%	11.7%	12.0%	24.6%	6.6%	26.1%	4.5%
1970	0.9%	3.9%	8.7%	15.8%	11.6%	24.3%	6.1%	23.9%	4.7%
1960	1.2%	4.3%	9.3%	21.4%	12.5%	22.4%	5.2%	19.3%	4.4%
1950	2.8%	2.9%	8.7%	25.0%	14.6%	22.6%	3.1%	16.2%	4.0%
1940	10.7%	0.8%	6.9%	33.8%	11.2%	16.6%	2.2%	15.1%	2.6%

Source: USDOC, Census, 2000a.

The unemployment rate for Jefferson Parish was 4.7 percent in 2004. The monthly data for January 2005 through August 2005 ranges from 3.8 percent to 5.7 percent. A Bureau of Labor Statistics report reports a 24.5 percent loss in employment from September 2004 to September 2005 (see Figure 26 in Section 6.5.2, taken from Garber et al., 2006). A measure of the devastation caused by Hurricane Katrina is that—as of January 2007—the Bureau of Labor Statistics, Local Area Unemployment Statistics database does not report unemployment rates, employment rates, or labor force for Jefferson Parish as of September 2005 (USDOL, BLS, 2007a).

7.5.3. Wages

Garber et al. (2006) notes that the average weekly wage in the parish went from \$660 in the third quarter of 2005 to \$812 in the fourth quarter of 2005. The authors interpret the data to indicate that a larger proportion of the jobs lost were in lower-paying positions.

7.5.4. Industry

Table 44 summarizes the compensation by industry for 2001 to 2005. Jefferson Parish has a diverse economy with government enterprises comprising 13 percent of the wages, health care and social services representing 11 percent of the wages, and manufacturing representing 10

percent of the wages. Mining (including oil and gas extraction) represents only two percent of the wages while transportation and warehousing is five percent of the wages.

Table 44

Compensation by Industry, Jefferson Parish: 2001-2005

Industry	Year					2005
	2001	2002	2003	2004	2005	Percent
Compensation	\$7,897,566	\$8,227,549	\$8,573,930	\$9,008,873	\$9,113,875	100%
Forestry, fishing, related activities, and other	\$6,630	\$6,616	\$6,883	\$6,834	\$5,217	0%
Mining	\$153,644	\$162,881	\$168,979	\$155,861	\$182,337	2%
Utilities	\$47,520	\$47,792	\$51,706	\$52,849	\$62,773	1%
Construction	\$604,502	\$607,066	\$611,157	\$600,433	\$592,808	7%
Manufacturing	\$745,210	\$811,447	\$893,684	\$921,918	\$869,759	10%
Durable goods	(D)	\$527,309	\$580,342	\$621,031	\$577,381	
Machinery	\$110,576	\$104,751	\$99,358	\$88,982	\$76,944	
Nondurable goods	(D)	\$284,138	\$313,342	\$300,887	\$292,378	
Food	\$40,617	\$47,486	\$65,811	\$49,674	\$43,511	
Petroleum and coal	\$18,411	\$22,901	\$20,697	\$14,623	\$13,203	
Chemical	\$65,110	\$57,869	\$60,809	\$63,210	\$62,390	
Plastics and rubber	\$53,998	\$59,082	\$60,967	\$69,172	\$76,418	
Wholesale trade	\$721,340	\$715,968	\$729,093	\$762,383	\$764,483	8%
Retail trade	\$775,224	\$824,691	\$830,018	\$871,943	\$846,385	9%
Transportation and storage	\$386,530	\$399,353	\$402,121	\$414,817	\$415,461	5%
Air transportation	\$56,473	\$54,618	\$46,642	\$46,760	\$41,001	
Rail transportation	\$37,801	\$36,003	\$35,892	\$33,263	\$33,723	
Water transportation	\$18,752	\$29,098	\$32,784	\$41,694	\$54,201	
Truck transportation	\$54,993	\$62,453	\$63,634	\$66,504	\$71,786	
Transit and ground passenger	\$11,940	\$13,660	\$14,956	\$15,965	\$14,459	
Support activities	\$100,112	\$94,633	\$96,536	\$92,383	\$81,692	
Couriers and messengers	\$40,933	\$45,838	\$42,086	\$49,903	\$48,185	
Warehousing and storage	\$60,849	\$58,476	\$64,793	\$63,703	\$66,554	
Information	\$193,700	\$187,282	\$171,493	\$201,856	\$178,944	2%
Finance and insurance	\$473,905	\$490,761	\$549,364	\$595,100	\$646,998	7%
Real estate, rental, and leasing	\$180,056	\$168,199	\$173,669	\$183,388	\$189,065	2%
Professional and technical services	\$585,799	\$590,954	\$572,714	\$618,516	\$593,265	7%
Management of companies and enterprises	\$111,483	\$122,746	\$108,792	\$117,660	\$157,850	2%
Administrative and waste services	\$351,771	\$365,397	\$376,936	\$406,051	\$419,286	5%
Educational services	\$72,643	\$74,514	\$83,615	\$86,760	\$88,266	1%
Health care and social assistance	\$702,873	\$744,412	\$838,744	\$901,317	\$992,929	11%
Arts, entertainment, and recreation	\$213,028	\$218,973	\$238,659	\$237,260	\$252,102	3%
Accommodation and food services	\$329,891	\$342,538	\$357,133	\$363,945	\$343,535	4%
Other services, except public administration	\$272,313	\$300,796	\$323,112	\$330,103	\$294,069	3%
Government and government enterprises	\$969,350	\$1,045,012	\$1,085,955	\$1,179,734	\$1,218,212	13%
Federal, civilian	\$132,991	\$134,269	\$136,722	\$161,855	\$159,210	
Military	\$41,621	\$56,438	\$79,789	\$89,014	\$103,051	
State and local	\$794,738	\$854,305	\$869,444	\$928,865	\$955,951	

Source: USDOC, BEA, 2005.

7.5.5. Marine-Based Activities

Aquaculture and fisheries contribute significantly to the Jefferson Parish economy. In 2002, the parish had 47 soft-shell crab farmers, 1,660 shrimpers, 292 crabbers, 499 commercial fin fishers, 28 catfish fishers, and 13 gar fishers. In this year, parish residents harvested 228,845 sacks of oysters, with a gross farm value of \$858,169, and 45,400 dozen soft-shell crabs, with a gross farm value of \$810,863. While freshwater fisheries brought in \$58,073 in sales, marine fisheries brought in nearly \$29.5 million in sales. The leading marine fishery product was shrimp, with a gross farm value of \$23.6 million, constituting well over a quarter of the state's total shrimp sales. In this same year, crabs brought in almost two million dollars and commercial finfish brought in four million dollars. The parish also produced 859 wild alligators, with a gross farm value of \$141,735 (IAI, 2004).

7.5.6. Military Installations

Other than a Search and Rescue Station of the U.S. Coast Guard in Grand Isle, there are no military installations on Jefferson Parish.

7.5.7. Tourism

Louisiana Department of Culture, Recreation, and Tourism is intensely active in rebuilding and revitalizing tourism in the storm-damaged areas (LA CRT, 2006 and 2007). Bayou Segnette and Grand Isle State Parks are open as is Jean Lafitte National Historical Park and Preserve. Grand Terre Island is bounded by Barataria Bay on the north, the Gulf of Mexico to the south, Pass Abel to the east, and Barataria Pass to the west. It is a barrier island which encompasses approximately 800 acres and provides hurricane protection. Among its unique features are coastal dune grasslands, including sea oats, purple sandgrass, saltgrass, wiregrass, sandburs, broomsedges, slatwort, and beach morning-glory. Rare/endangered species include the sandbur and the brown pelican. Grande Terre provides a nesting colony for waterbirds (herons, egrets, gulls, terns), and the waters around the island serve as a nursery area for finfish and shellfish. The island also lies on the migration route of songbirds and passerines. Recreational uses include birding, saltwater fishing, nature tours, and walks. Commercial uses include shrimping and crabbing. The Louisiana Department of Wildlife and Fisheries operates a research facility on the island.

A second site, Jean Lafitte National Historic Park (Barataria Preserve), is bounded on the north by Delery Canal, on the south by LA Highway 301, on the east by LA Highway 45, and on the west by Lake Salvador. This site, which occupies approximately 20,000 acres, contains a cypress-tupelo gum swamp.

Watersports on Lake Pontchartrain, parks throughout the parish, and the museums are recreational options within the parish (Jefferson Parish, 2007). Jefferson Parish nestles around New Orleans and thus indirectly supports the tourist activities in that city.

7.6. Local Government

7.6.1. Governmental Structure

Jefferson Parish's government is administered by a Parish Council. The municipalities are administered by Mayor-Council and Mayor-Alderman systems. (Jefferson Parish, 2007).

7.6.2. Revenues and Taxation

For the early part of 2005, sales tax collections ranged from \$9.2 million to \$10.9 million per month. In September 2005, they were \$4.5 million. The parish has continued to recover and from January to September 2006, the sales tax collections ranged from \$13.4 million to \$16.0 million per month (Broussard and Young, 2006).

7.7. Social Context

7.7.1. Housing

Slightly more than half of the housing units in Jefferson Parish sustained hurricane damage. Nearly 20 percent of all the housing units sustained major or severe damage (HUD, PD&R, 2006).

7.7.2. Education

As of November 2006, there are 85 schools in the Jefferson Parish School District. Pre-Katrina enrollment was about 49,000 students. Post-Katrina enrollment is about 43,820 students. All but one parochial school in the parish are operational (Broussard and Young, 2006). Bond ratings for Jefferson Parish remained at a pre-Katrina level of A3 (Trotter, 2006).

Additionally, there are two institutions of higher education located within the parish: University of Phoenix in Metairie and Louisiana Technical College (Jefferson and West Jefferson campuses) (University of Phoenix, 2007; LTC, 2007). Further, ten colleges and universities lie within one hour's commuting distance (Entergy, 2007a). Of the 15 libraries operating pre-Katrina, 10 were operating as of November 2006 (Broussard and Young, 2006).

Figures 32 and 33 are overlays of OCS-related infrastructure with the percentage of the adult population that completed college or post-graduate degrees. There are two areas in the northern part of the parish where more than half of the adult population completed college or further studies. Table 45 tracks the increasing level of education in the parish population from 1940 through 2000. In 2005, about 82 to 84 percent completed high school and between 22 and 24 percent held a bachelor's degree or higher (USDOD, Census, 2006c).

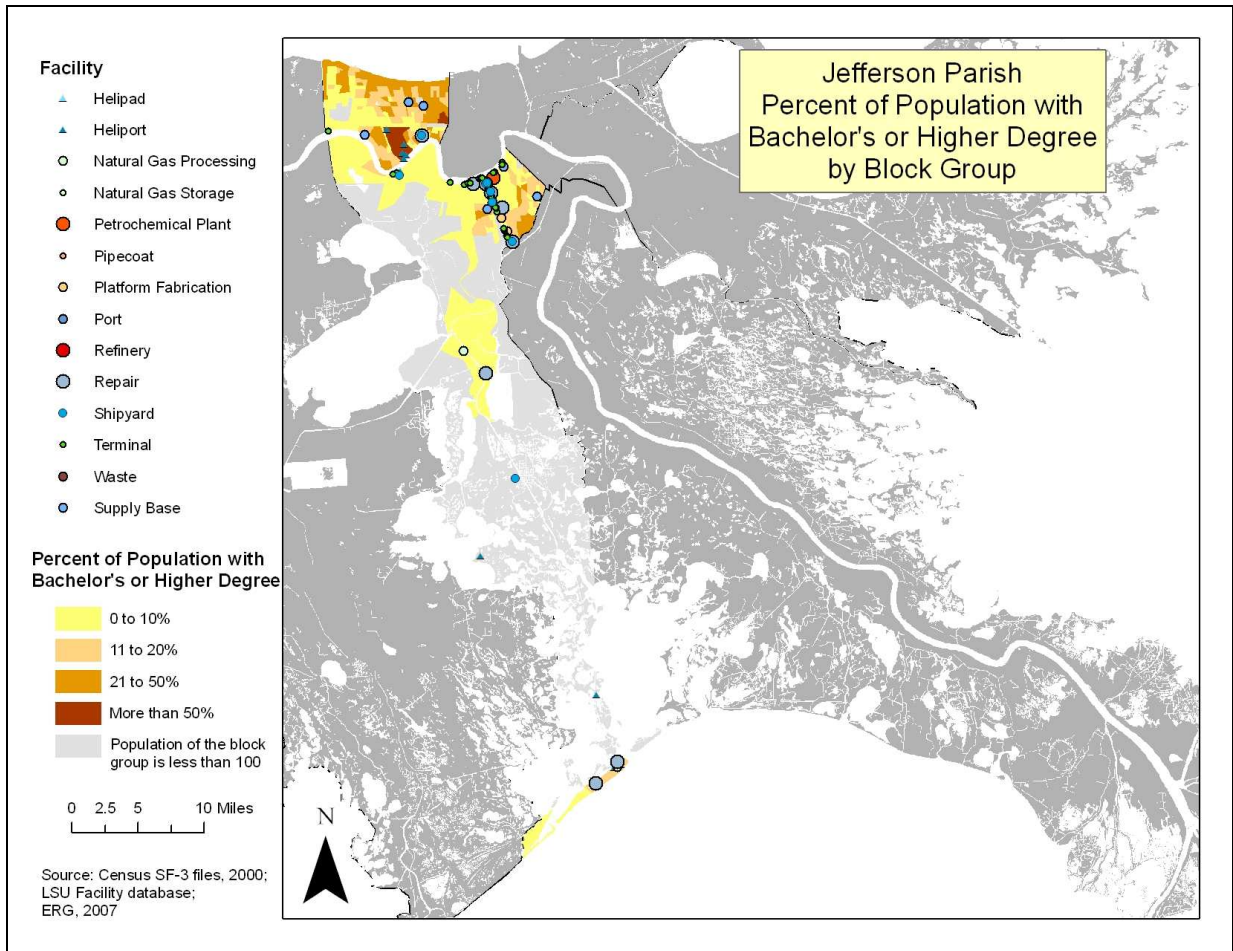


Figure 32. Jefferson Parish—OCS-related infrastructure with percentage of population with bachelor's or higher degree.

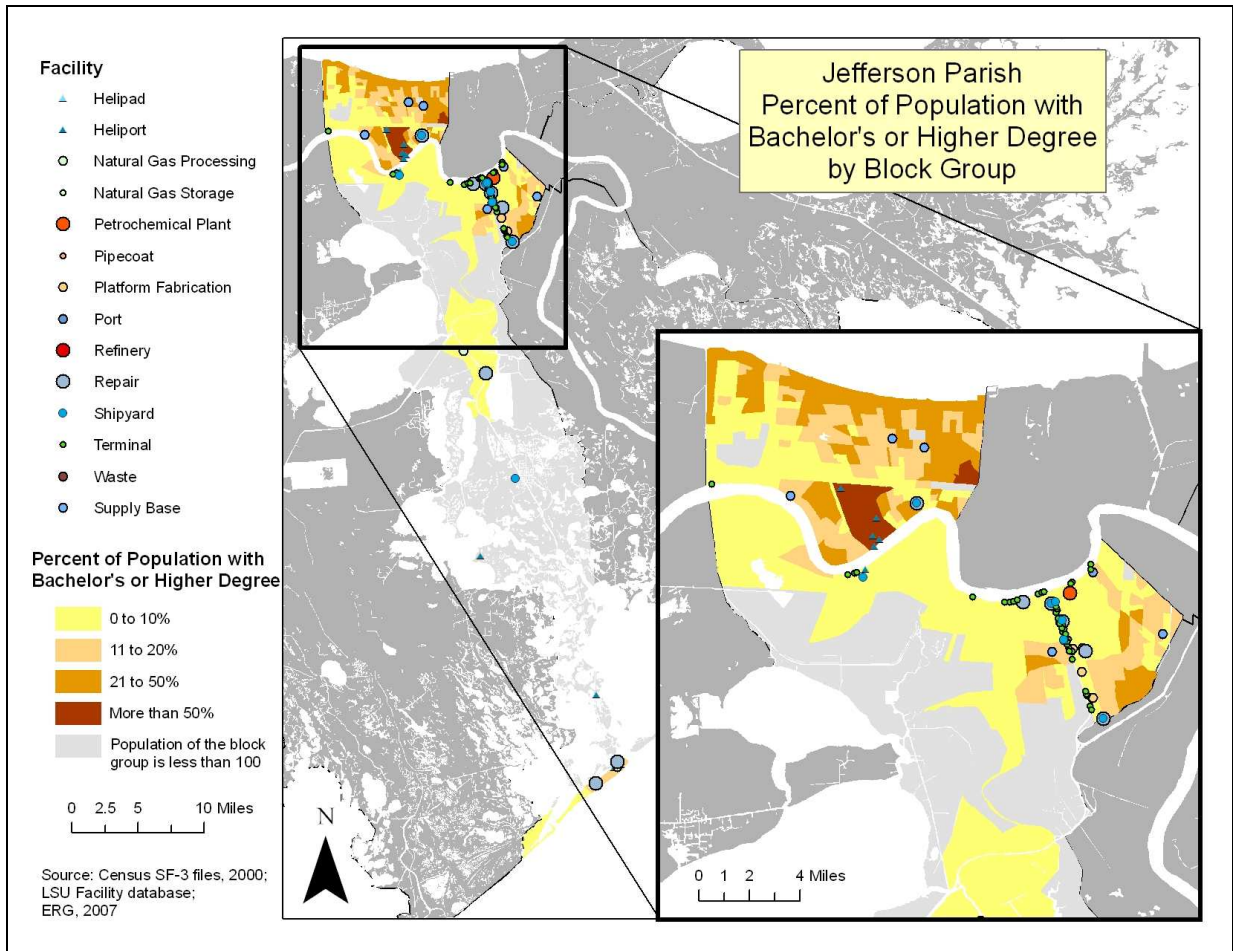


Figure 33. Jefferson Parish inset—OCS-related infrastructure with percentage of population with bachelor's or higher degree.

Table 45

Educational Attainment of Adults (age 25+), Jefferson Parish: 1940-2000

Year	Educational Attainment of Adults					Ratio to State	
	0-8 years	Some High School	High School Diploma	Some College, No Degree	BA/BS or more	High School Diploma	BA/BS or more
2000	7%	14%	30%	23%	22%	1.06	1.13
1990	11%	13%	32%	25%	19%	1.11	1.16
1980	17%	14%	36%	16%	16%	1.19	1.17
1970	28%	19%	31%	11%	11%	1.25	1.22
1960	39%	16%	27%	8%	9%	1.37	1.35
1950	57%	14%	16%	7%	5%	1.27	1.08
1940	73%	12%	9%	3%	3%	0.86	0.84

Source: USDOC, Census, 2000a.

7.7.3. Health and Welfare

All six of Jefferson Parish's hospitals are operating as of August 2006 (LRA, 2006). In 2005, Jefferson Parish's hospitals together offered a total of 1,890 beds: East Jefferson General Hospital (454 beds), West Jefferson Medical Center (451 beds), Ochsner Foundation Hospital (475 beds), Kenner Regional Medical Center (203 beds), Meadowcrest Hospital (207 beds), and River Oaks Hospital (100) (Entergy, 2007a). Despite its many facilities, parts of southern Jefferson Parish are classified as medically underserved (LDHH, 2006).

7.7.4. Religion

Religion is an important facet of community life in Jefferson Parish. In 2000, 74 percent of parish residents identified as Catholic, 12 percent as Baptist, and an additional 14 percent claimed membership in other denominations or religions (ARDA, 2006c).

7.8. Impacts from Hurricane Katrina and OCS-Related Infrastructure

Jefferson Parish ranks 2nd in terms of concentration of OCS-related infrastructure with:

- 1 petrochemical plant
- 46 terminals
- 8 shipyards
- 9 ship repair facilities
- 9 supply bases
- 6 platform fabrication facilities
- 2 natural gas processing facilities
- 15 heliports/helipads

The Chemtura Corporation reported \$4.6 million in damages to facilities due to Hurricanes Katrina and Rita, but no mention was made of the petrochemical plant in Geismar that needed to shut down during repairs (Chemtura, 2005). Terrell and Bilbo (2006) note that Jefferson Parish is second only to St. Tammany Parish in terms of recovery.

Six oil companies located in Metairie (Century Exploration of New Orleans, Energetix Petroleum, Forest Oil, Grey Exploration Co., LLOG Exploration Offshore, and Zot Oil & Gas) evacuated as a result of the storm but have returned by March 2006 (OCSBBS, 2006).

7.9. Issues of Concern

The primary concerns are recovery from Hurricanes Katrina and Rita as well as coastal erosion (Barras et al., 2004).

8. ST. BERNARD PARISH, LOUISIANA

8.1. Introduction

The socioeconomic profile for St. Bernard Parish changed on August 29, 2005 when Hurricane Katrina devastated the region. We present socioeconomic data for 2000 and 2005 with the understanding that these data reflect the past and may have no relationship with the current and future St. Bernard Parish.

Orleans Parish borders St. Bernard Parish on the north and west. Plaquemines Parish borders St. Bernard Parish on the west while the Gulf of Mexico forms its eastern border. St. Bernard Parish also creates the western boundary of the Mississippi Sound and part of the southern boundary of the Breton Sound. The Mississippi River lies to the northwest and Lake Lery to the west. The parish encompasses about 465 square miles of land, much of which is marshland, cheniers, and barrier islands. St. Bernard Parish rests on alluvium and delta-plain deposits from the Holocene period and the average elevation is five feet (USDOC, Census, 2005g; St. Bernard Parish.Net, 2007). The low-lying nature of the parish meant that it was totally submerged under Hurricane Katrina's storm surge.

8.2. Built Environment

8.2.1. Human Geography/Population Centers

The aqueous landscape in the eastern portion of the parish renders it generally inhospitable. Thus, the majority of the population resides in the parish's western portion, where the elevation is higher, transportation is more plentiful, and New Orleans is only five miles away. Chalmette, the parish seat (2000 pop. 32,069), is nine miles from New Orleans. Other communities in the parish include Meraux (10,191 residents), Arabi (8,093), Violet (8,555), and Poydras (3,886) (USDOC, Census, 2000d).

8.2.2. Transportation and Communication

Interstate 510 passes through the parish, as do State Highways 39, 46, and 47. Norfolk Southern Railroad serves the parish's freight needs, but there are no motor freight lines. Amtrak offers passenger rail service out of New Orleans. The nearest major airport is also in New Orleans, 20 miles from Chalmette (St. Bernard Parish.Net, 2007).

St. Bernard Parish Port, with a channel depth of 45 feet, is located in the parish. The Norfolk Southern Railroad serves the intermodal port and it is a Foreign Trade Zone. Heavily damaged during the hurricanes, it was handling 70 percent of pre-storm cargo by the end of 2005 (St. Bernard Port, 2005).

8.3. History

The Washa and the Bayougoula people are among the earliest known native inhabitants of the St. Bernard Parish area. In the 18th Century, after France transferred the Louisiana territory to

Spain, the Spanish began to colonize the area and brought in people from the Canary Islands (now known as Isleneos or Islanders). A little later, many French Acadian refugees settled in St. Bernard. Originally part of the New Orleans district, Saint Bernard Parish was officially established in 1807 when the Orleans territory was divided. In 1815, General Jackson defeated British invaders at the Battle of New Orleans, fought on the plain of Chalmette. In the Civil War, St. Bernard was occupied by Union troops for the duration of the war after the capture of New Orleans in 1862 (St. Bernard Parish.Net, 2007). The economy was primarily farming and fishing.

By the 1940s, St. Bernard Parish began a transition from a rural to a suburban area with the leasing of marshlands to oil companies. This involvement in the oil and gas industry grew over time; the parish has about 1,400 wells, two refineries, and natural gas processing plants. Kaiser Aluminum built the Chalmette works and its closure in recent years resulted in the loss of over 2,000 jobs. Domino Sugar’s refinery and Chalmette Medical Centers are also major employers in the parish (IAI, 2004).

8.4. Demographic Characteristics

8.4.1. Population

St. Bernard Parish had a population of 67,229 in 2000. The population dropped slowly—by July 1, 2004, the population was 64,848 and by July 1, 2005, the population was 64,576, see Table 46. Hurricane Katrina hit August 29, 2005 and devastated the region. By January 1, 2006, only 3,361 people remained in all of St. Bernard Parish; a decline of 95 percent (USDOC, Census, 2006b).

Table 46

Population Changes, St. Bernard Parish: 2000 to 2006

Year	Population	Change From Previous Period	Percent Change From Previous Period
2000	67,229	--	--
July 1, 2004	64,848	-2,381	-3.54%
July 1, 2005	64,576	-272	-0.42%
January 1, 2006	3,361	-61,215	-94.80%

Source: USDOC, Census, 2006b.

8.4.2. Ethnicity and Age

Historically, Caucasians have comprised the majority of the St. Bernard Parish population. In 2005, Caucasians comprised 86.4 percent of the population and African Americans were 10.5 percent. Hispanics may be of any race and so are included in applicable race categories. About 5.5 percent of the residents in St. Bernard reported themselves as Hispanics (see Table 47) (USDOC, Census, 2005g). With the massive depopulation caused by Hurricane Katrina, the demographic characteristics of the parish could change dramatically.

Table 47

Racial and Ethnic Populations, St. Bernard Parish: 2005

Race/Ethnicity	Percent
White	86.4%
African American	10.5%
Hispanic*	5.5%
American Indian	0.5%
Asian	1.5%
Pacific Islander	0.0%
Two or More Races	1.2%

* Hispanics may be of any race.
Source: USDOC, Census, 2005g.

Figure 34 is an overlay of the 2000 Census data with the OCS-related infrastructure. The Census variable is the percent of the black population by block group. The large amount of gray area in the figure is due to fewer than 100 persons living in a block group. For most of the parish, the black population accounts for zero to 10 percent of the population. There is a small area located on the bend of the river where the black population is between 51 to 75 percent of the population. There is no visual correlation between the concentration of black population and OCS-related infrastructure.

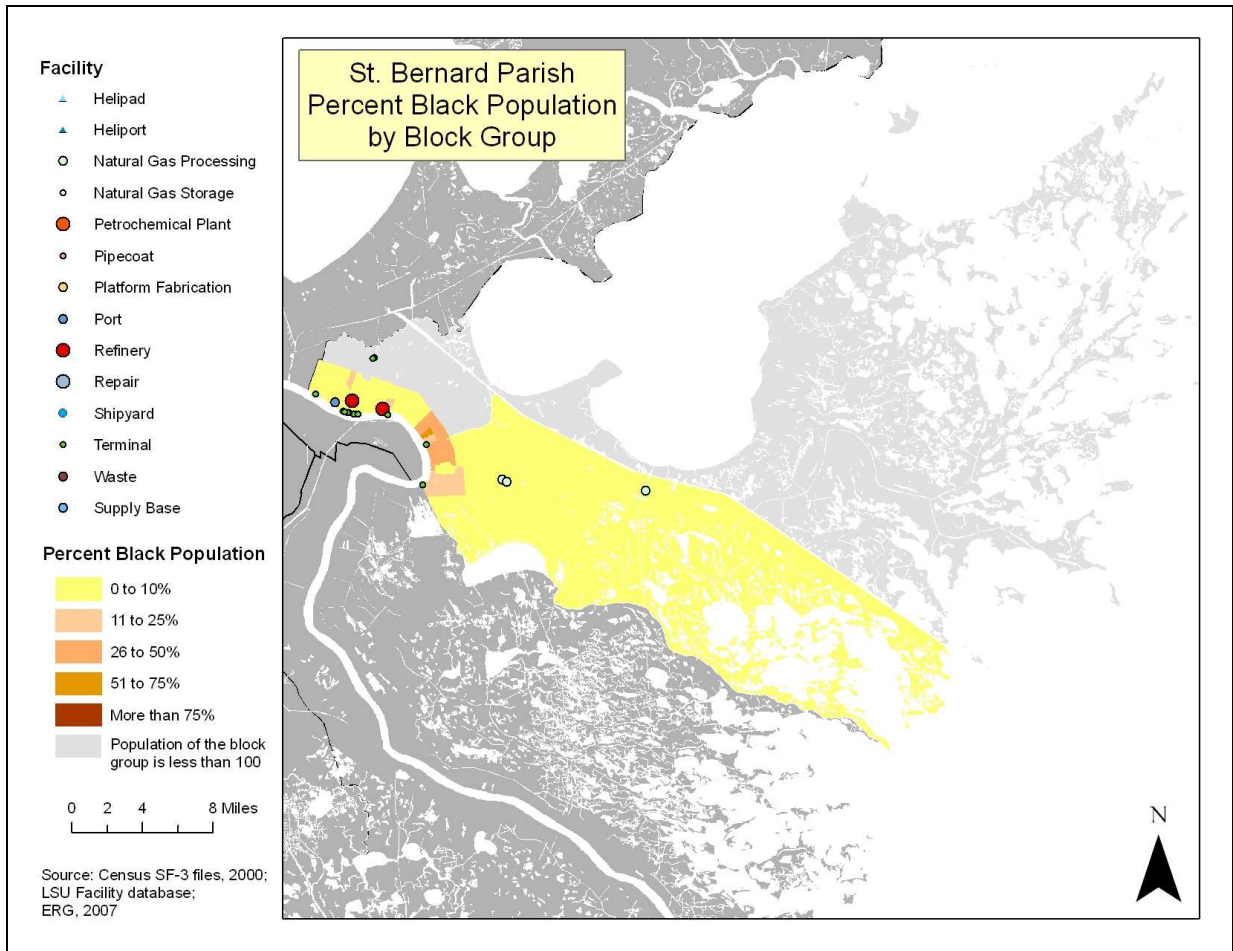


Figure 34. St. Bernard Parish—percent black population by block group.

In 2005, the median age for St. Bernard residents was 37.2 years. This is only slightly higher than median age for the United States (36.4 years). Nearly 25 percent of the population was less than 18 years of age while 12 percent of the population was 65 years of age or older. The age distribution for St. Bernard is similar to that for the rest of the nation (USDOD, Census, 2005g).

8.5. Economy

8.5.1. Income and Poverty

Figure 35 is an overlay of the 2000 Census data with the OCS-related infrastructure. The Census variable is the percent of the population with income lower than the national poverty level. There are no block groups where more than half the people have income below the poverty level. The eastern part of the parish has a higher rate of poverty than the western part. There is no visible correlation of OCS-related infrastructure with higher poverty levels.

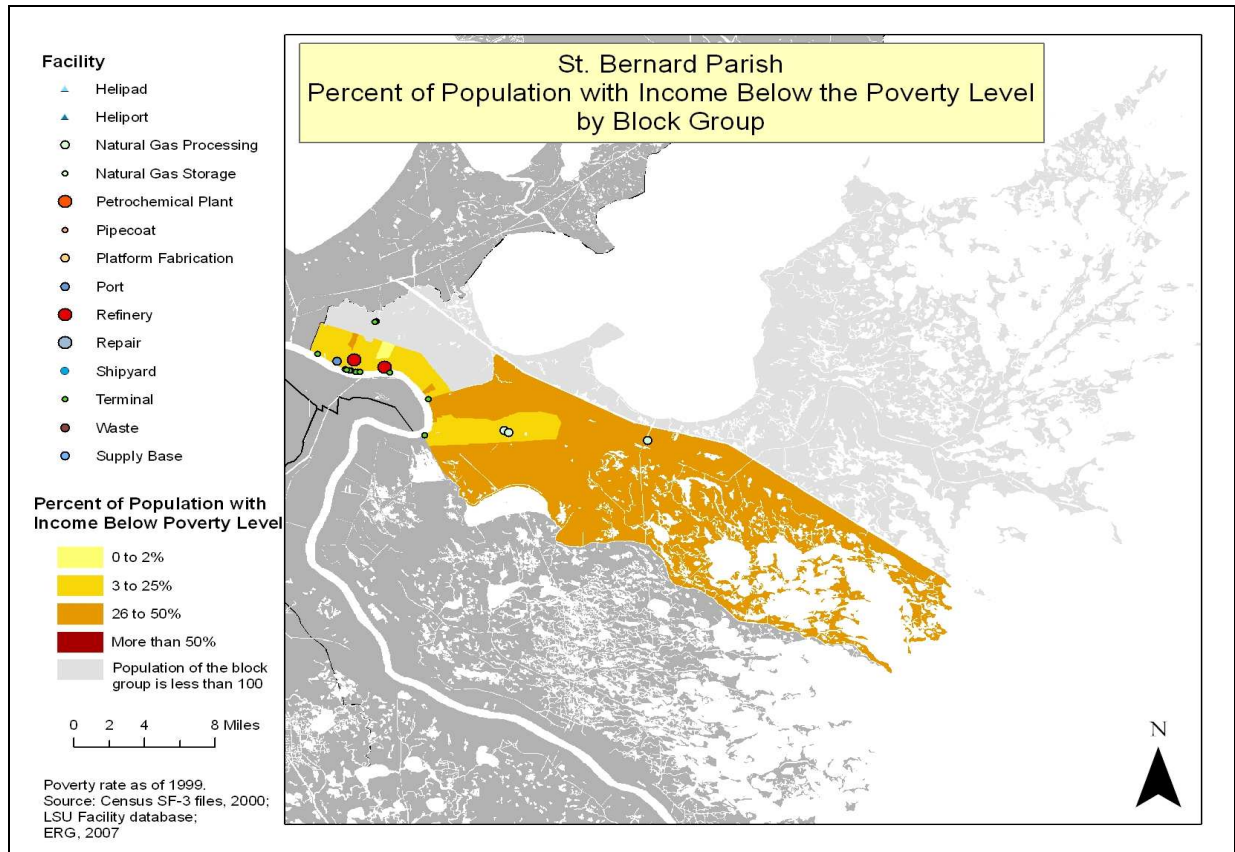


Figure 35. St. Bernard Parish—percent of population with income below poverty level by block group.

8.5.2. Employment

Prior to Hurricane Katrina, St. Bernard Parish had an industrial base of petroleum refining (ExxonMobil and Murphy Oil) and sugar refining (Domino Sugar Corporation). The St. Bernard School Board and Chalmette Medical Centers were major employers for the parish (Entergy, 2007c).

The unemployment rate for St. Bernard Parish was 5.3 percent in 2004. The monthly data for January 2005 through August 2005 ranges from 4.5 percent to 6.3 percent. A Bureau of Labor Statistics report reports a 38 percent loss in employment from September 2004 to September 2005 (see Figure 26 in Section 6.5.2). A measure of the devastation caused by Hurricane Katrina is that—as of January 2007—the Bureau of Labor Statistics, Local Area Unemployment Statistics database does not report unemployment rates, employment rates, or labor force for St. Bernard Parish as of September 2005 (USDOL, BLS, 2007d).

8.5.3. Wages

In 2003, the median household income (MHI) for St. Bernard Parish was \$36,156 while that for Louisiana was \$33,792 (USDOD, Census, 2005g). That is, St. Bernard had a higher MHI than the rest of the state. The data for 2005 incorporate the effects of Katrina. In 2005, the median household income (MHI) for St. Bernard Parish was \$34,858 while that for Louisiana was \$46,242 (USDOD, Census, 2006e). Garber et al. (2006) notes that the average weekly wage in the parish went from \$620 in the third quarter of 2005 to \$934 in the fourth quarter of 2005. The authors interpret the data to indicate that a larger proportion of the jobs lost were in lower-paying positions.

8.5.4. Industry

Table 48 summarizes the compensation by industry for St. Bernard Parish for 2001 to 2005. Manufacturing accounts for the largest percentage of wages for the parish, particularly chemical and petroleum products.⁹ The next largest group of employers, in terms of wages, are government entities at the federal, state, and local levels. Third is health care and social services, representing 12 percent of compensation (USDOD, BEA, 2005).

Section 8.8 provides an overview of the impacts of Hurricane Katrina on the OCS-related infrastructure in St. Bernard Parish. With the devastation of the parish, the oil and gas sectors have been leading the recovery of industry and employment.

8.5.5. Marine-Based Activities

St. Bernard Parish is home to the Breton National Wildlife Refuge. Established in 1904, it is the second oldest refuge in the National Wildlife Refuge System. The refuge is comprised of a series of barrier islands including Breton Island and all of the Chandeleur Islands (USDOD, USFWS, 2007). The rest of St. Bernard is equally wealthy with the parish being considered one of the best fishing areas in the United States. With the abundance of water and waterways, the parish receives significant income from water recreation, including saltwater fishing, shrimping and crabbing, and birding. Commercial uses include shrimping, crabbing, oyster cultivation, and fishing.

8.5.6. Military Installations

There are no military installations in St. Bernard Parish.

8.5.7. Tourism

The St. Bernard Parish government is actively seeking to increase tourism in the post-Katrina era. Festivals listed for the first half of 2007 include Battle of New Orleans Anniversary Commemoration, Chalmette Battlefield in Chalmette, Mardi Gras, Los Islenose Fiesta, a crawfish festival, and a tomato festival (St. Bernard Parish Government, 2007). The parish

⁹ The actual numbers are withheld due to the small number of companies and confidentiality.

includes the Breton National Wildlife Refuge and the St. Bernard State Park (St. Bernard Parish.Net, 2007).

Table 48

Compensation by Industry, St. Bernard Parish: 2001-2005

Industry	Year					Percent
	2001	2002	2003	2004	2005	2005
Compensation of employees, received	\$524,678	\$598,321	\$649,945	\$672,664	\$607,694	
Forestry, fishing, and related activities	(D)	(D)	(D)	(D)	(D)	
Mining	\$4,879	(D)	(D)	(D)	(D)	
Utilities	(D)	\$2,568	\$2,721	\$2,980	\$2,948	0%
Construction	\$46,939	\$47,133	\$69,293	\$68,609	\$54,516	9%
Manufacturing	\$92,710	\$131,429	\$136,908	\$144,506	\$136,259	22%
Durable goods	\$15,715	\$16,701	\$18,320	\$16,516	\$12,759	
Nondurable goods	\$76,995	\$114,728	\$118,588	\$127,990	\$123,500	
Petroleum and coal products	\$58,081	\$91,524	\$93,577	\$95,207	(D)	
Chemical	\$239	\$299	\$233	(D)	(D)	
Wholesale trade	\$21,097	\$22,080	\$19,839	\$22,689	\$27,396	5%
Retail trade	\$50,906	\$51,606	\$54,199	\$54,955	\$43,859	7%
Transportation and warehousing	\$31,978	\$40,247	\$37,520	\$31,644	\$32,458	5%
Information	\$5,215	\$5,776	\$5,502	\$6,210	\$5,689	1%
Finance and insurance	\$10,812	\$13,351	\$14,325	\$13,739	\$12,982	2%
Professional and technical services	\$8,978	\$9,844	\$12,085	\$11,779	\$9,312	2%
Management of companies	\$5,927	\$6,744	\$4,218	\$5,321	\$7,289	1%
Administrative and waste services	\$7,789	\$12,045	\$11,769	\$10,325	\$10,061	2%
Educational services	\$4,952	(D)	(D)	\$5,397	\$5,586	1%
Health care and social assistance	\$68,899	(D)	(D)	\$94,476	\$75,145	12%
Arts, entertainment, and recreation	\$4,534	\$5,565	\$6,012	\$6,606	\$4,438	1%
Accommodation and food services	\$16,623	\$17,590	\$18,213	\$18,274	\$13,851	2%
Other services, except public admin.	\$28,264	\$31,307	\$35,089	\$36,260	\$31,198	5%
Government and government enterprises	\$100,410	\$106,728	\$116,667	\$125,451	\$121,252	20%
Federal, civilian	\$7,250	\$7,367	\$7,485	\$8,169	\$7,647	
Military	\$5,773	\$7,293	\$10,281	\$10,667	\$12,330	
State and local	\$87,387	\$92,068	\$98,901	\$106,615	\$101,275	

Source: USDOC, BEA, 2005.

8.6. Local Government

A Parish Council governs the parish with seven district Council members and a Council President elected parishwide. The Council also provides water, sewer, drainage, parks and recreation, and fire protection. An elected sheriff directs the police department (St. Bernard Parish.Net, 2007). For several months after Katrina, much of the parish had no essential services such as electricity, water, and sewer. On November 2005, Standard & Poor's lowered its rating for the parish's sales tax revenue bonds from 'A' to 'B' due to the "severe economic dislocation and uncertainty over restoration of a viable, sustainable economy and revenue performance (Brookings Institute, 2006)."

8.7. Social Context

8.7.1. Housing

Approximately 80.6 percent of the housing units in St. Bernard Parish sustained hurricane damage. Nearly 79 percent of all the housing units sustained major or severe damage (HUD, PD&R, 2006).

8.7.2. Education

Prior to Katrina, the St. Bernard Parish School District maintained 14 public schools (seven elementary, three middle school, and four high schools). In addition, there are two schools sponsored by religious organizations. Approximately 2,000 students attended Nunez Community College (St. Bernard Parish.Net, 2007). With the depopulation of the parish due to hurricane damage, the educational system will likely look different in the future. Public school enrollment was approximately 8,880 students in October 2004, dropping to 955 in January 2006, and recovering to 3,500 in October 2006 (GNOCDC, 2007). Standard & Poor's lowered its rating on the parish's school District No. 1 general obligation bonds from 'BBB+' to 'BB' (Brookings Institute, 2006).

Figure 36 is an overlay of the 2000 Census data for educational level by block group with the OCS-related infrastructure. In none of the blocks is the percentage of people with a college education or graduate degree higher than 20 percent. Most of the blocks are in the 0 to 10 percent range.

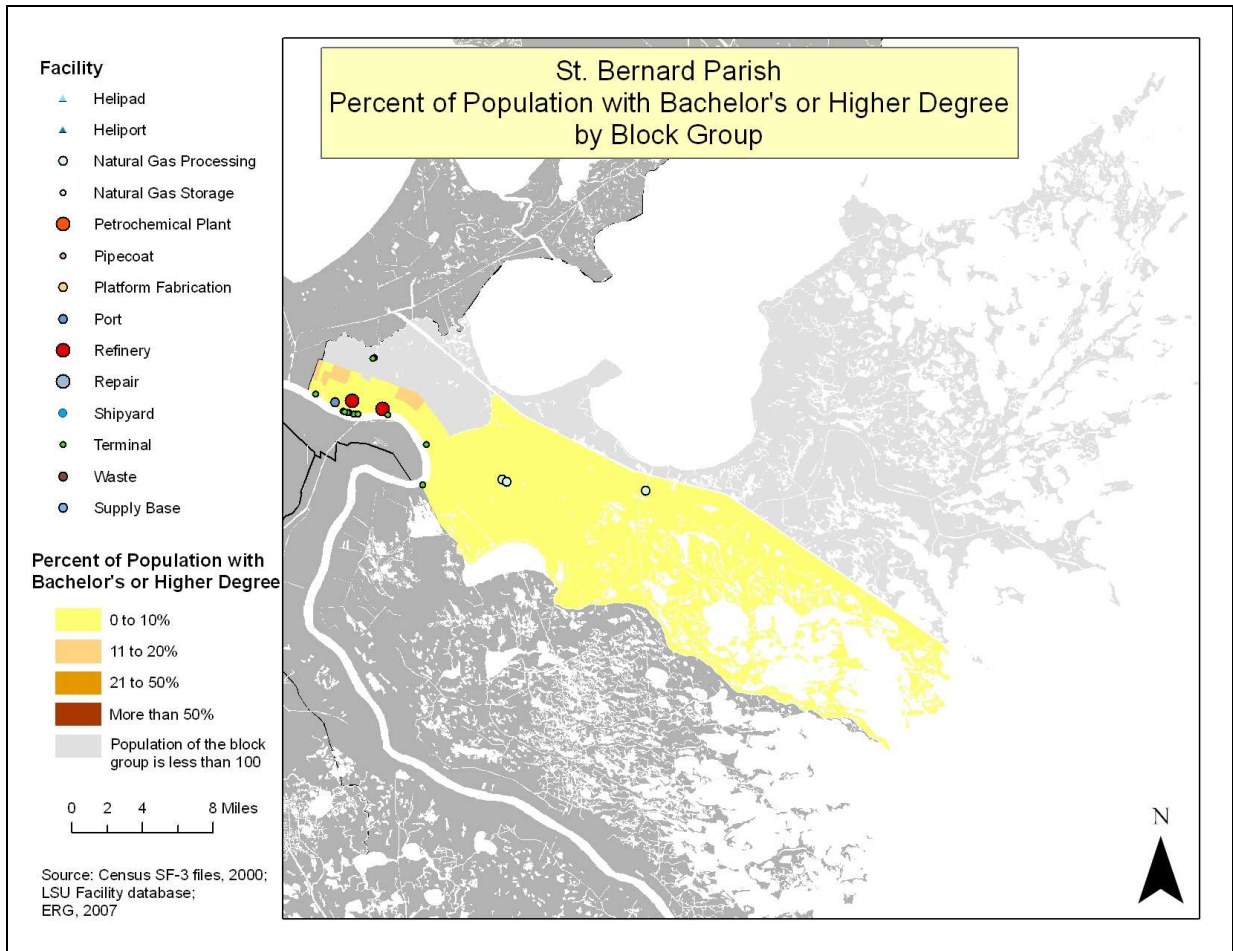


Figure 36. St. Bernard Parish—percentage of population with bachelor’s or higher degree by block group.

8.7.3. Health and Welfare

The Chalmette Medical Center has 228 beds and four nursing homes. As of 2005, St. Bernard Parish was classified as a medically underserved area (LDHH, 2006).

8.7.4. Recreation

St. Bernard has the Breton National Wildlife Refuge, a state park, more than 20 public parks, and public boat launches. Hunting and fishing are also popular in the area (St. Bernard Parish Government, 2007).

8.7.5. Religion

In 2000, 38,338 of St. Bernard Parish residents claimed a religious affiliation: 87 percent Catholic, four percent Baptist, and nine percent “other” (ARDA, 2006f).

8.8. Impacts from Hurricane Katrina and OCS-Related Infrastructure

St. Bernard Parish ranks 20th highest in terms of concentration of OCS-related infrastructure with:

- 2 refineries
- 3 natural gas processing facilities
- 12 terminals, and
- 1 port

Figure 5 in Section 3.2 above, however, shows that the entire parish was under water from the storm surge. In effect, St. Bernard Parish was wiped clean.

The ExxonMobil refinery in Chalmette was shutdown on August 26, 2005 as a precautionary measure. With power out, no roads, and few of the buildings in the parish intact, ExxonMobil set up a temporary village built in the refinery's main parking lot. By mid-November, the plant was back to full production (ExxonMobil, 2005; USDOE, OE, 2005).

Hurricane Katrina hit the Murphy Oil refinery with such power that a storage tank was moved off its base. The refinery processing units were flooded to a depth between two and six feet of water while the tank farm was under up to 18 feet of water. The day after the hurricane struck, Murphy Oil began manning the plant, initially coming in by boat on the Mississippi River, a five-hour one-way trip (Murphy Oil Corporation, 2006). The resultant oil spill is estimated at 1 million gallons and the company is currently in court to settle clean-up costs (Finch, 2007). It took more than nine months for the damage to the refinery to be repaired; the refinery restarted in May 2006.

Two of the natural gas processing plants were on line by the end of November 2005 while the third was functional in early 2006 (EPP, 2005).

8.9. Issues of Concern

The issue of concern is the recovery from Hurricane Katrina. The community is extremely resilient and imaginative. In January 2007, some members of the St. Bernard Parish Council recommended that the 5,000 to 7,000 building slabs from homes destroyed during Katrina be used to armor the levees along the Mississippi River-Gulf Outlet (Warren, 2007).

9. ORLEANS PARISH, LOUISIANA

9.1. Introduction

On August 29, 2005, Orleans Parish's world changed forever. Hurricane Katrina made landfall at Buras, located in the midsection of Plaquemines Parish, and roared past Orleans. The eye of the (then) Category 3 hurricane passed about 20 miles to the east of New Orleans, bringing with it a storm surge ranging from 10 to 20 feet (Knabb et al., 2006b). And then, the levees failed. It is the costliest and one of the five deadliest hurricanes to strike the United States. This profile is not the place to document the destruction caused by Hurricanes Katrina and Rita in Orleans Parish; there will be books and movies that will do the subject more justice than is possible here (e.g., Lee, 2006). This profile focuses on Orleans Parish and its relationship with OCS-related infrastructure and presents 2000 and 2005 economic data (where they exist) with the understanding that these data reflect the past and may bear little relation with the current and future Orleans Parish.

While Orleans is the smallest parish in Louisiana in terms of land size (180 square miles), it is also the most densely populated. With a pre-Katrina 2005 population of about 455,000 persons, Orleans was the most populous parish in Louisiana (USDOC, Census, 2005e). Orleans is bordered by Lake Pontchartrain to the north, Lake Borgne to the east, Saint Bernard Parish to the south, and Jefferson Parish to the west. New Orleans is the parish seat. The parish's average annual temperature is 68 degrees (60 January; 90 in July), with an average of 62 inches of rain per year (Entergy, 2007b).

The parish was a key service-center for the state as a whole, hosting a wide range of medical and educational facilities. Nearly 38 percent of parish earnings come from its service sector. Tourism also contributes significantly to the parish economy; weekenders come to New Orleans from all over the U.S., and day-trippers from all over the state. Its music, Mardi Gras celebration, sporting festivals, and Jean Lafitte National Historical Park, French Quarter Unit are international attractions.

9.2. Built Environment

9.2.1. Human Geography/Population Centers

The city of New Orleans serves as the parish seat. The city of New Orleans has the same boundary as Orleans Parish; however, the New Orleans Metropolitan Statistical Area includes Kenner and Metairie in neighboring Jefferson Parish (USDOC, Census, 2005e).

9.2.2. Transportation and Communication

Orleans Parish is a major metropolitan center with many roads, thoroughfares, and points of access, including U.S. Interstates 10, 510 and 610, U.S. Highways 90 and 61, and Louisiana Highways 39 and 46. The Canadian Central/Illinois Central, Kansas City Southern, New Orleans Lower Coast, New Orleans Public Belt, Norfolk Southern, and Union Pacific railroads service freight transport as do 76 motor freight lines. Amtrak provides passenger service out of

New Orleans, but travel eastward to Biloxi, Mississippi is still out of service until the hurricane-damaged rails are repaired (Entergy, 2007b; Amtrak, 2009).

The Louis Armstrong New Orleans International Airport is located 13 miles outside the city of New Orleans and offers service from a number of major airlines. As of August 2006, the airport has 111 daily flights to 22 cities. The number of passengers is about 81 percent of pre-Katrina traffic and the number of destinations is about 77 percent of pre-storm levels (LRA, 2006). The New Orleans Lakefront Airport has one operational runway at this time (New Orleans Lakefront Airport, 2007).

Orleans Parish is home to the Port of New Orleans—one of the U.S.'s largest deepwater ports. The port was founded in 1718 by the French, and has since been a major center for international trade. This port has 22 miles of river coverage for cargo handling area and more than six million square feet of covered storage area. During Hurricane Katrina, the Port lost nearly 25 percent of its facilities located along the Inner Harbor Navigation Canal and the Mississippi River-Gulf Outlet, which received serious flood and wind damage. The other 75 percent of the Port's facilities on the Mississippi River did not flood and received only wind damage to transit sheds and warehouses. During the first five months of 2006, the Port moved more than 1.4 million short tons of cargo, thus exceeding Pre-Katrina tonnage levels (Port of New Orleans, 2006a). In October 2006, the docking of the Norwegian Sun marked the return of home-ported cruise ships to New Orleans (Port of New Orleans, 2006b).

9.2.3. Physical Infrastructure

The Parish of Orleans provides water and sewer services to its residents (Entergy, 2007b). As of August 2006, 60 percent of former customers in New Orleans had electricity and 41 percent had gas service. Parts of the Lower Ninth Ward are still under a partial boil water advisory (LRA, 2006).

9.2.4. Interaction between Built and Physical Environments

Orleans Parish contains two Gulf Ecological Management Sites (GEMS). The first, Bayou Sauvage National Wildlife Refuge, is a 22,700-acre site adjacent to Lake Pontchartrain. Its primary ecosystem function is to support migratory, shore, and wading birds, and to provide recreation. It contains low-lying levees, basins, marshes, canals, and open water. Vegetative species include maidencane, Roseau cane, bulltongue, duckweed, and water hyssop. Rare and endangered species found at the site include the American alligator, the Mississippi kite, and the Peregrine falcon. The site provides a breeding area for shore and wading birds, alligators, and furbearers, as well as a nursery area for finfish. Songbirds and passerines and wintering ducks and geese visit the area during migration.

The Refuge has potential recreational uses for wildlife observation, trail hikes, canoe trails, biking, bird walks, boating, nature demonstrations, interpretive programs, audio-visual presentations, outdoor classrooms, fishing, crabbing, waterfowl, and rabbit hunting. It was damaged during Katrina but re-opened (USDOJ, USFWS, 2006a).

Big Oak Island, a second GEMS managed by the LA Department of Natural Resources lies adjacent to US 90 and Gentilly Road. This 2,000-acre site primarily provides flood control and a riparian habitat. It houses a live oak-hackberry forest whose species additionally include water oak, American elm, and green ash. Rare and endangered species include the saw palmetto. It additionally provides a breeding/nursery area for wading birds (herons, egrets, ibises) and a stopping point for songbirds and passerines. Birding is Big Oak Island's primary recreational use. It also contains a late prehistoric midden that is of archaeological interest. Man-made threats to Big Oak Island include silviculture and residential development (LDNR, 2001).

9.3. History

9.3.1. Settlement

Although Louisiana's prehistory dates back as far as 10,000 B.C., the presence of humans in what is now Orleans Parish dates back only to 500 B.C., to what is known as the "Tchefuncte Period." Characterized by the first major use of ceramic vessels and by the planting of maize and squash, the Tchefuncte Period is defined as a part of the general southeastern Early Woodland cultural. This archaic culture had a subsistence based largely on shellfish gathering and hunting from the area's marshes and swamps. And while the use of pottery was extensive, the craftsmanship was rather crude. Excavations of earth middens in the area reveal that the dead were buried in shell mounds. The Little Woods cultural mound site is located within the parish.

The Chawasha and Washa (Ouacha) were the first Neo-Indian people in the Orleans Parish region, as well as the first allies of French explorers. The Washa were known to have settled along Bayou Lafourche, but post-1718 accounts reveal that the Washa also settled in the vicinity of New Orleans. The Chawasha were "wandering people of the seacoast," who settled with the Washas below New Orleans. Instigated by the French who feared that the slave and Native American communities would join forces, the Natchez uprising in 1730 killed 30 Chawasha. The remaining Chawashas eventually integrated into the Houma, Bayougoula, Acolapissa, Biloxi, and Chitimacha tribes.

In the late 1600s, the Houma ("Red") migrated from central Louisiana to the southern and western part of the state. These people settled in the New Orleans region along the shore of Lake Pontchartrain. The Täensa also passed through the region in the early 1700s as they migrated to Mobile Bay.

In 1682, the first French explorers came to the area from Canada by way of the Mississippi. They initially were looking for high ground upon which to establish a colony. Not finding any suitable ground, they settled in the New Orleans area because of its short backdoor route to the Gulf of Mexico. In 1718, Jean Baptiste La Morgue established New Orleans as the capital of Louisiana (named after the French King Louis the XIV).

The period between 1718 and 1810 is generally considered an essentially French/European era of New Orleans. Growth of New Orleans during this time was slow and difficult for a number of reasons. First, the French government's attitude toward emigration was exceedingly

conservative—they preferred settlers who were both Catholic and French. Also adding to the cities slow growth pattern was its lack of gold, agriculture, infrastructure, and technology. Consequently, New Orleans experienced a labor shortage that was subsequently filled with slaves. By 1800, African slaves comprised more than 50 percent of New Orleans’ population.

In April, 1764, the first Acadians to settle along the Mississippi River arrived in New Orleans. These 20 exiles were joined a year later by 80 Acadian refugees from Halifax and Saint-Domingue, and five months later by 82 Acadians from the Attakapas post who had fled the yellow fever epidemic of the Teche region.

Orleans was one of the first 12 parishes carved from the Territory of Orleans. In the early 1700s, the population of New Orleans was 250. In 1760, it was 4,000 and by 1803 it was 8,000. During this period, however, both the parish and the city were plagued by small pox and yellow fever, and death rates were high. The spread of these diseases were abetted by the semitropical climate, unsanitary conditions, open sewerage, and the low-lying, mosquito-ridden landscape (IAI, 2004).

9.3.2. Industrialization

Before the Civil War, New Orleans’ slave population decreased dramatically; in part because yellow fever, small pox, and cholera commonly affected and killed laborers. As the slave population diminished, plantation owners began hiring Irish immigrants for their labor instead of investing the purchase money in slaves. At the same time, many slaves bought their freedom and stayed in the New Orleans area.

After New Orleans became part of the United States, growth and trade continued at an astounding rate. From 1803 to 1861, New Orleans experienced a population growth that exceeded any other U.S. city during this time. This population increase was partly due to New Orleans’ position as a central port during the height of the cotton era.

Between 1830 and 1862, a wave of Irish immigration into New Orleans helped to accelerate the parish’s growth from 49,826 to 102,193 and dramatically changed the black/white population ratio. Prior to 1830, the parish’s population was mostly black—both slave and free people of color—with a black to white ratio of five-to-two. By 1940, and after the Irish immigrant influx, whites became the majority; by 1950, the white population constituted 80 percent of the city’s total population.

Germans also came to the area in the 1840s. At this time, two separate cities existing above and below Canal Street comprised the city: Faubourg Marigny and the French Quarter. After the wave of Germans came into the area, however, Faubourg Marigny earned the nickname “Little Saxony.” By the time of the Civil War, German-Americans comprised nearly one-sixth of the city’s population (IAI, 2004).

New Orleans is home to at least eight offshore oil and gas companies: Cimarex Energy Co., Coldren Oil & Gas, Dominion Exploration & Production, Helis Oil & Gas Company, McMoRan

Oil and Gas LLC, Shell-GOM Production, Taylor Energy, and Virgin Oil Company (OCSBBS, 2006).

9.4. Demographic Characteristics

9.4.1. Population Growth

In 2000, the population of Orleans Parish was 484,674 (Table 49). Although the parish population has been the largest in the state since 1920, it also has been declining steadily since 1960 when the population peaked at 628,000. Moreover, Orleans Parish has been a net out-migration area for the entire period for which data have been available (1950-1990). However, population decline in the 1990s has slowed considerably; between 1990 and 2000, the parish lost just about three percent of its residents (USDOC, Census, 2000b).

Table 49

Population Changes, Orleans Parish: 1920 to 2000

Year	Population	Rank in State	Change From Previous Census	Percent Change From Previous Census	Rank in Growth Rate	Net Migration Since Previous Census
2000	484,674	1	-12,264	-2.5%	55	-
1990	496,938	1	-60,577	-10.9%	60	-102,320
1980	557,515	1	-35,956	-6.1%	62	-87,085
1970	593,471	1	-34,054	-5.4%	53	-101,890
1960	627,525	1	57,080	10.0%	32	-40,985
1950	570,445	1	75,908	15.3%	16	-
1940	494,537	1	35,775	7.8%	44	-
1930	458,762	1	71,543	18.5%	24	-
1920	387,219	1	-	-	-	-

Source: USDOC, Census, 2000b.

Table 50 illustrates the massive effect of the hurricanes on Orleans Parish. The region lost more than half of its population. The dislocation is of such magnitude that the Bureau of Labor Statistics and the Census Bureau developed special studies and methodology to evaluate the impacts (Cahoon et al., 2006; Brown et al., 2006).

Table 50

Population Changes, Orleans Parish: 2000 to 2006

Year	Population	Change From Previous Period	Percent Change From Previous Period
2000	484,674		
July 1, 2004	443,430	-41,244	-8.51%
July 1, 2005	437,186	-6,244	-1.41%
January 1, 2006	158,353	-278,833	-63.78%

Source: USDOC, Census, 2006b.

9.4.2. Ethnicity and Age

The racial composition of the Orleans Parish population has shifted throughout the twentieth century. For example, its population was 74 percent Caucasian in 1920, 63 percent in 1950, 55 percent in 1970, 42 percent in 1980, and 35 percent in 1990. The Hispanic population has remained constant at about three percent since 1970, while the African-American population has increased from 26 percent in 1920 to 67 percent in 2000. In 2000, the Orleans Parish population was 67 percent African-American, 28 percent Caucasian, three percent Hispanic, and two percent Asian (USDOC, Census, 2000b).

Figure 37 overlays the 2000 Census data by block group with OCS-related infrastructure. Much of the parish has blocks where more than 75 percent of the population is black. The Ninth Ward is visible on the border of Lake Pontchartrain. Figure 38 is the poverty level by block group information for the New Orleans-Metairie-Kenner Metropolitan Statistical Area (New Orleans MSA). The lower percentage of black population in the Jefferson Parish parts of the New Orleans MSA is apparent.

In 2005, the population of Orleans Parish was 28 percent Caucasian, 67.5 percent African-American, and 2.4 percent Asian (Table 51). Hispanics may be of any race and so are included in applicable race categories. About 3.1 percent of the residents of Orleans Parish reported themselves as Hispanics. About one percent of the population reported themselves as two or more races (USDOC, Census, 2007).

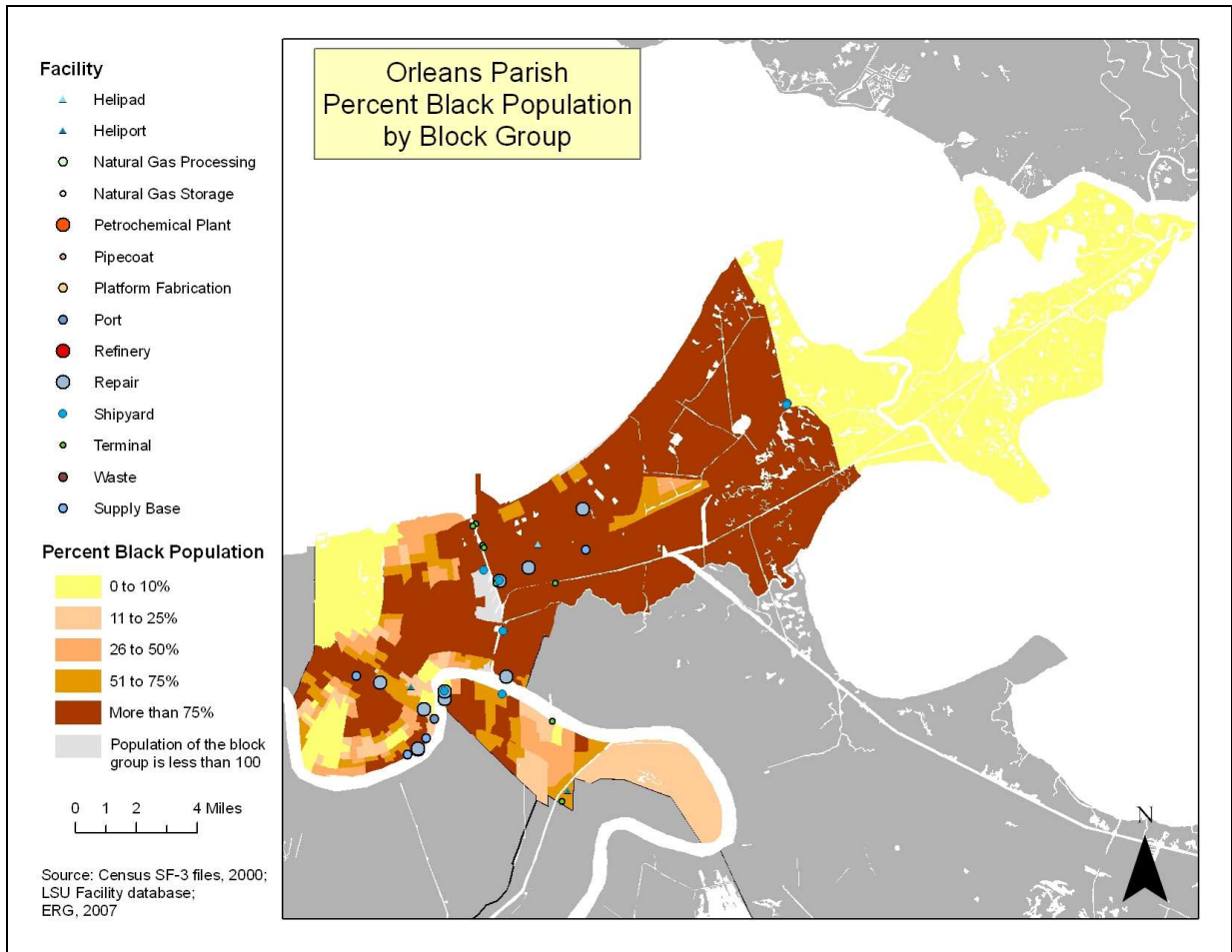


Figure 37. Orleans Parish—percent black population by block group.

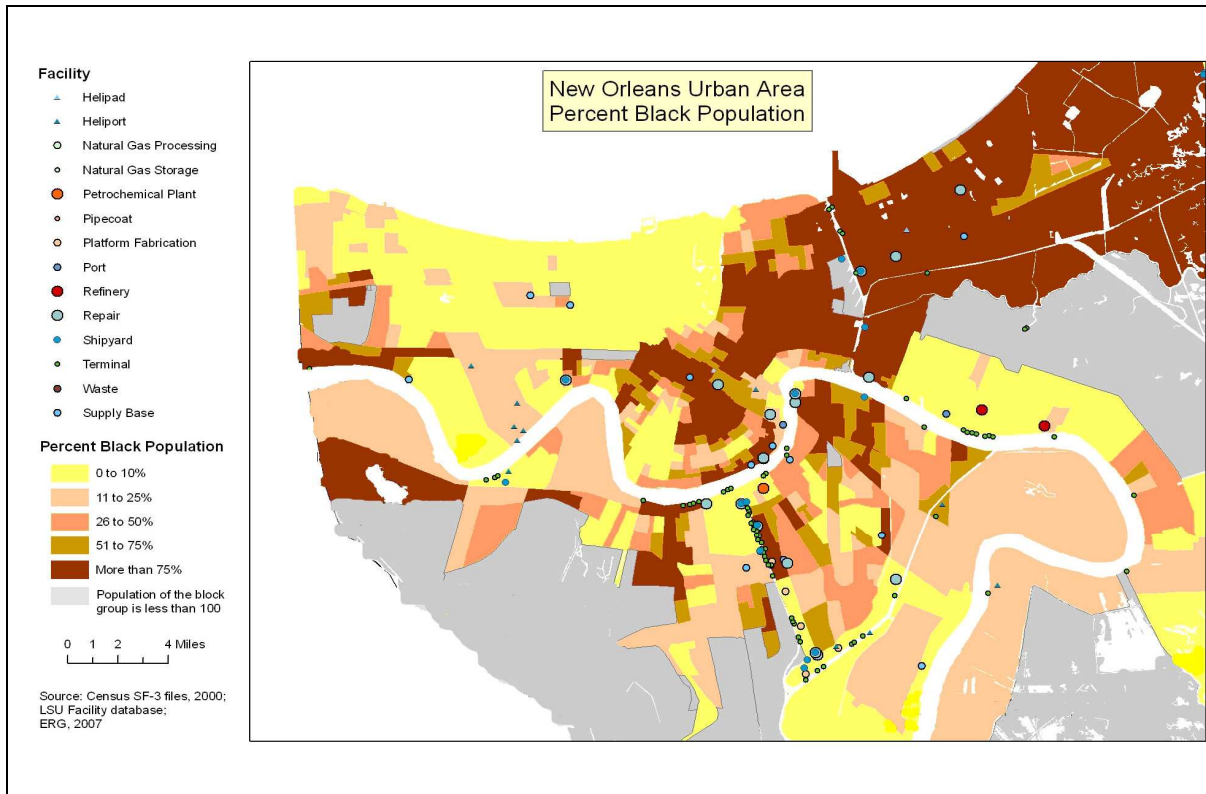


Figure 38. New Orleans MSA—percent black population by block group.

Table 51

Racial and Ethnic Populations, Orleans: 2005

Race/Ethnicity	Percent
White	28.0%
African American	67.5%
Hispanic*	3.1%
American Indian	0.2%
Asian	2.4%
Pacific Islander	0.0%
Two or More Races	1.0%

* Hispanics may be of any race.

Source: USDOC, Census, 2007.

The ethnic makeup of Orleans Parish may change as a result of Hurricane Katrina. Shea (2007) reports on studies published in *American Anthropologist*. Among the findings are that 80 percent of the debris removal jobs have been filled by Latino laborers; that the oystering community may not make a comeback, and that “former New Orleanians are creating and recreating dense social networks. But they’re doing it elsewhere.” Simmons (2007) notes that nearly 100,000 Hispanics migrated to the devastated regions of the Gulf Coast and some now allege racial profiling in New Orleans.

In 2005, the American Community Survey reported that the median age in Orleans Parish was 35.2 years, slightly below the national median age of 36.4 years (USDOC, Census, 2007). A special Census Bureau report on the New Orleans-Metairie-Kenner Metropolitan Statistical Area showed statistically different demographic estimates between January to August 2005 and September to December 2005. In early 2005, the area had an estimated population of 1,190,615 with a median age of 37.7 years. After the storms, the population was 723,830 and the median age of the remaining population was 41.6 years (USDOC, Census, 2006d).

9.5. Economy

9.5.1. Income and Poverty

In 2005, the median household income in Orleans Parish was \$30,711 while the national median family income was \$46,242. About 21.8 percent of the families had income below the poverty level in 2005 (USDOC, Census, 2007). Figure 39 overlays the percent of the population with incomes below the poverty level by block group from the 2000 Census. There are pockets where more than half the population is in poverty and there is some coincidence of OCS-related infrastructure with areas of high poverty. Figure 40 is the poverty level by block group information for the New Orleans-Metairie-Kenner Metropolitan Statistical Area (New Orleans MSA). Comparing Figures 39 and 40 indicates that the majority of blocks with high proportions of the population in poverty are primarily, but not solely, in Orleans Parish.

Figure 41 is the 1999 median income by block group for the New Orleans Metropolitan Statistical Area. Note that, in this figure, darker colors indicate areas of higher income; that is, the dark areas in Figures 39 and 40 correspond to the light areas in Figure 41. Note the disparities in median income on the opposite sides of the Harvey Street canal with the OCS-related infrastructure running between the two groups.

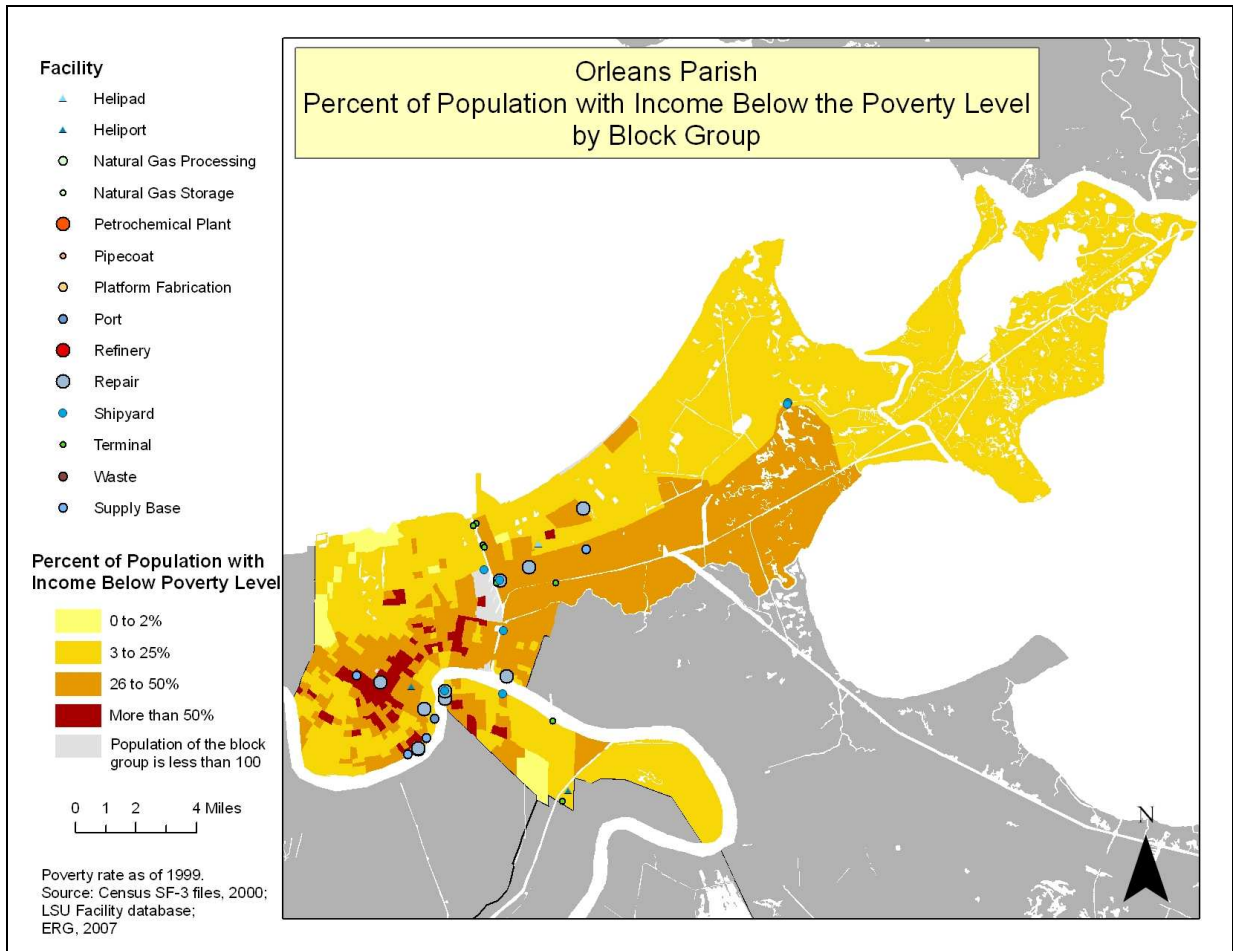


Figure 39. Orleans Parish—percent of population with income below the poverty level.

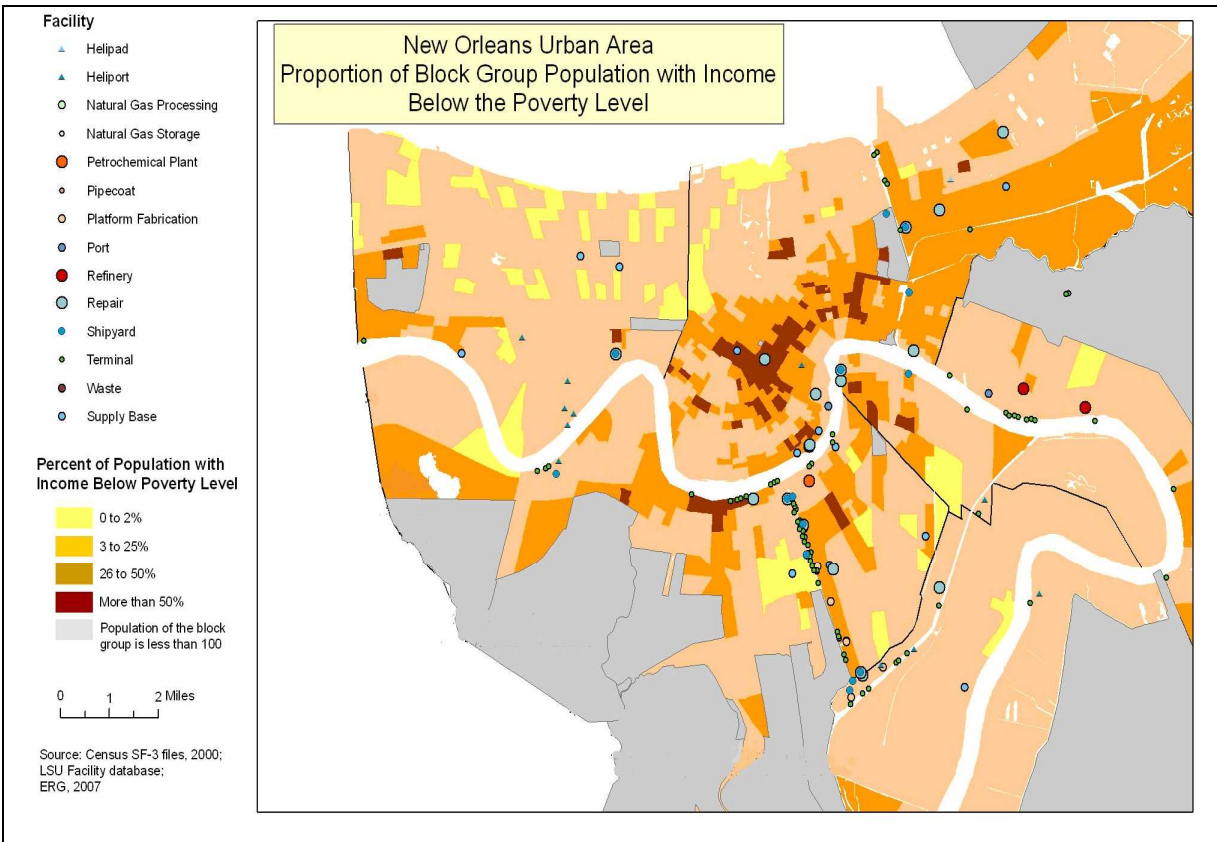


Figure 40. New Orleans MSA—percent of population with income below the poverty level.

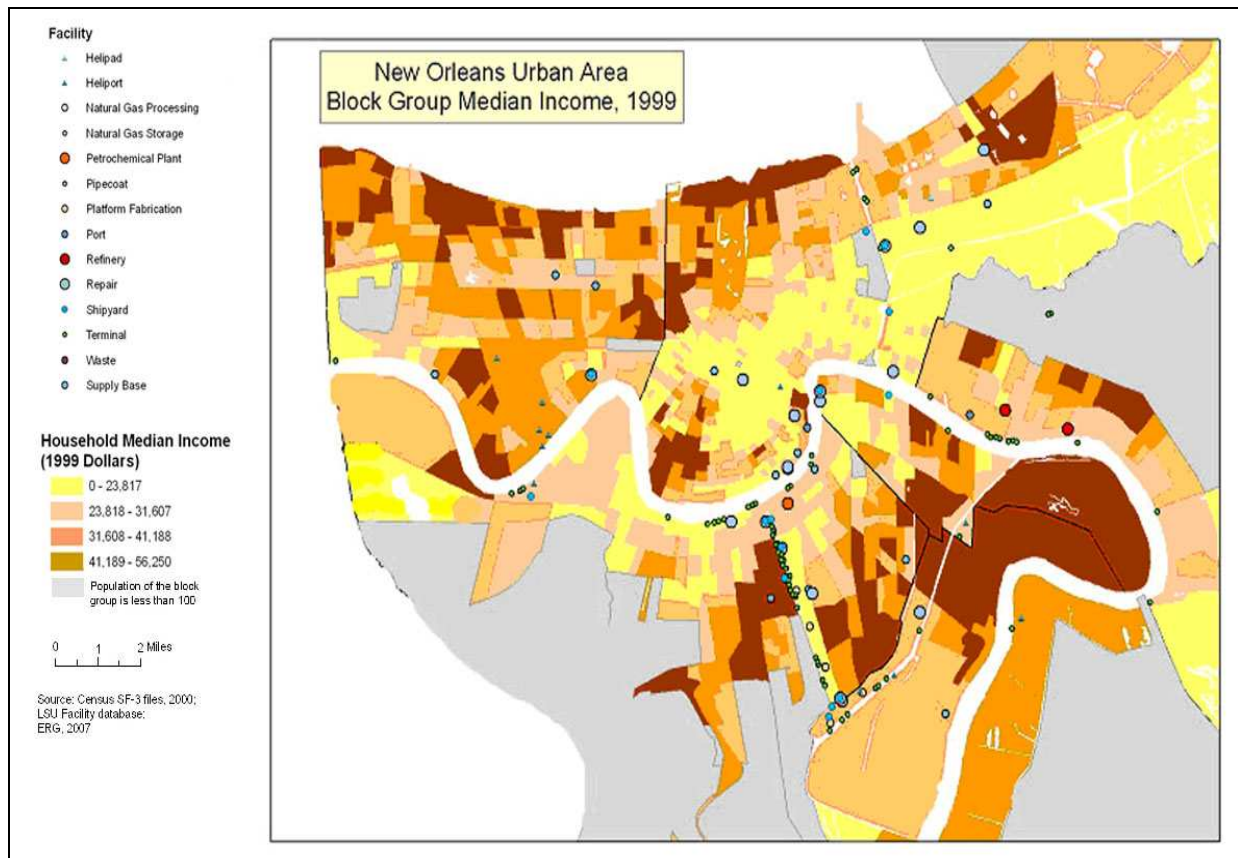


Figure 41. New Orleans MSA—median income by block group.

9.5.2. Employment and Industry

New Orleans' economy was heavily dependent on tourism and the convention business but the parish also hosts the Port of New Orleans, one of the nation's leading cargo ports (see Section 9.2) and home to several oil company headquarters. Table 52 shows the steady growth in employment in the Services sector from 1940 through 2000. Employment related to the oil industry is classified under mining. That industry's employment peaked in the 1980s, lost over 40 percent of the jobs in the oil price collapse of the mid-1980s, and continued to decline through 2000.

Table 52**Employment in Major Industrial Sectors, Orleans Parish: 1940-2000**

Year	Agric., Fishing & Forestry	Mining	Constr	Manuf.	Trans., Comm.& Public Util.	Wholesale & Retail Trade	Finance, Insur., and Real Estate	Services	Public Admin.
Workers in sector									
2000	358	1,638	9,478	9,925	15,832	23,748	10,677	107,715	12,366
1990	1,539	2,966	7,480	12,728	16,908	38,683	11,303	83,078	11,351
1980	1,403	5,316	13,479	21,121	23,956	47,282	12,403	80,974	12,759
1970	1,364	3,576	12,061	24,830	22,125	48,682	12,064	71,911	12,174
1960	1,048	2,464	13,189	30,472	27,127	50,070	12,303	58,066	13,061
1950	1,110	919	15,158	30,630	31,962	56,343	10,200	54,065	13,273
1940	1,613	205	10,223	28,992	24,550	42,535	8,266	49,992	8,267
Percent of workers in sector									
2000	0.1%	0.8%	4.9%	5.2%	8.3%	12.3%	5.6	56.2%	6.4%
1990	0.8%	1.6%	4.0%	6.8%	9.1%	20.8%	6.1%	44.7%	6.1%
1980	0.6%	2.4%	6.2%	9.7%	11.0%	21.6%	5.7%	37.0%	5.8%
1970	0.7%	1.7%	5.8%	11.9%	10.6%	23.3%	5.8%	34.4%	5.8%
1960	0.5%	1.2%	6.3%	14.7%	13.1%	24.1%	5.9%	27.9%	6.3%
1950	0.5%	0.4%	7.1%	14.3%	15.0%	26.4%	4.8%	25.3%	6.2%
1940	0.9%	0.1%	5.9%	16.6%	14.1%	24.4%	4.7%	28.6%	4.7%

Source: USDOC, Census, 2000b.

Table 53 tracks the changes in employment by industry in the New Orleans MSA from September 2005 through May 2006. From September 2004 to September 2005, the area lost nearly 205,000 jobs or 33.5 percent in employment. By May 2006, the devastation had eased slightly; the job loss from May 2005 was 185,000 jobs or 30.1 percent in employment. A closer inspection of Table 53, however, indicates that the job losses were not equally spread over all the industries. Government, the second largest employer, lost 13.3 percent of employment by May 2006. Natural resources and mining, a sector that had already been declining, shows the second lowest percentage loss in employment, that is, 22.4 percent. Professional and business services, education and health services, leisure and hospitality, and other services lost between 33.9 percent and 56.6 percent of employment (Garber et al., 2006).

The unemployment rate for Orleans Parish was 5.9 percent in 2004. The monthly data for January 2005 through August 2005 ranges from 4.9 percent to 7.1 percent. A Bureau of Labor Statistics report reports a 27 percent loss in employment from September 2004 to September 2005 (Garber et al., 2006). A measure of the devastation caused by Hurricane Katrina is that—as of February 2007—the Bureau of Labor Statistics, Local Area Unemployment Statistics database does not report unemployment rates, employment rates, or labor force for Orleans Parish as of September 2005 (USDOL, BLS, 2007b).

Table 53**Employment Changes in New Orleans MSA, September 2004-May 2006**

Industry	Employment Level (000s)				Change in Employment			
	Sept. 2004	Sept. 2005	May 2005	May 2006	Sept 2004-Sept 2005		May 2005-May 2006	
					Number	Percent	Number	Percent
Total Nonfarm	610.1	405.5	614.7	429.7	-204.6	-33.5	-185.0	-30.1
Natural Resources and Mining	38.1	21.6	38.4	29.8	-16.5	-43.3	-8.6	-22.4
Construction	29.8	12.7	30.0	19.5	-17.1	-57.4	-10.5	-35.0
Manufacturing	38.8	27.2	38.4	28.6	-11.6	-29.9	-9.8	-25.5
Trade, Transportation, and Utilities	121.1	83.0	123.5	90.2	-38.1	-31.5	-33.3	-27.0
Information	10.1	8.3	9.6	7.3	-1.8	-17.8	-2.3	-24.0
Financial Activities	34.3	25.2	23.9	24.5	-9.1	-26.2	-8.4	-25.5
Professional and Business Services	71.0	43.7	75.6	45.3	-27.3	-38.5	-30.3	-40.1
Education and Health Services	84.3	14.5	81.7	45.7	-42.8	-50.8	-36.0	-44.1
Leisure and Hospitality	84.2	46.5	87.4	57.8	-37.7	-44.8	-29.6	-33.9
Other Services	22.4	8.5	22.6	9.8	-13.9	-62.1	-12.8	-56.6
Government	105.8	100.0	104.6	90.7	-5.8	-5.5	-13.9	-13.3

Source: Garber et al., 2006.

9.5.3. Wages

Garber et al. (2006) note that the average weekly wage in the parish went from \$746 in the third quarter of 2005 to \$968 in the fourth quarter of 2005. The authors interpret the data to indicate that a larger proportion of the jobs lost were in lower-paying positions.

9.5.4. Marine-Based Activities

The Port of New Orleans handles cruise lines and cargo (see Section 9.1). The city is home to several oil companies with offshore operations. The city and surrounding communities are important centers of distribution and seafood consumption. The parish hosts eight terminals, seven shipyards, ten repair facilities, and four supply bases relating to OCS-infrastructure.

9.5.5. Military Installations

The Naval Air Station New Orleans/Joint Reserve is a reserve air training base located in New Orleans. It is home to the Louisiana National Guard, Air Force Reserve, U.S. Coast Guard, and U.S. Customs Service and stages daily training missions. Orleans Parish also has a Naval Support Activity location but the 2005 BRAC recommended closing this local site (GlobalSecurity.org, 2007b).

9.6. Local Government

9.6.1. Governmental Structure

A Parish Council with seven Council members administers the Orleans' government. At the end of 2006, a manager was selected to lead the recovery efforts (Bohrer, 2006). The parish supplies water and sewerage to its constituents (Entergy, 2007b). Portions of the Lower Ninth Ward are still under partial boil water advisory (LRA, 2006).

9.6.2. Revenues and Taxation

For fiscal year ending June 2006, Orleans Parish sales tax collections were \$61.72 million or 23 percent lower than the previous year. Standard & Poor's lowered New Orleans General Obligation bond rating from BBB to B (Brookings Institute, 2006).

9.7. Social Context

9.7.1. Housing

Approximately 71.5 percent of the housing units in Orleans Parish sustained hurricane damage. Nearly 56 percent of all the housing units sustained major or severe damage (HUD, PD&R, 2006).

9.7.2. Education

October 2006 public school enrollment for Orleans Parish was estimated at 25,651 students, down from 66,372 students in October 2004. As of January 2007, 55 total schools were open in Orleans Parish while 77 schools remained closed (GNOCDC, 2007). All impacted colleges are open as of Fall 2006 (LRA, 2006).

Figure 42 shows the 2000 Census data for the percentage of population with a Bachelor's degree or higher by block group while Figure 43 shows the same data for the New Orleans MSA. Institutions of higher education located in the parish include: the University of New Orleans, Delgado Community College, Tulane University, Loyola University, Southern University-New Orleans, Xavier University, Louisiana State University Medical Center, Dillard University, Our Lady of Holy Cross College, and Notre Dame Seminary (Entergy, 2007b).

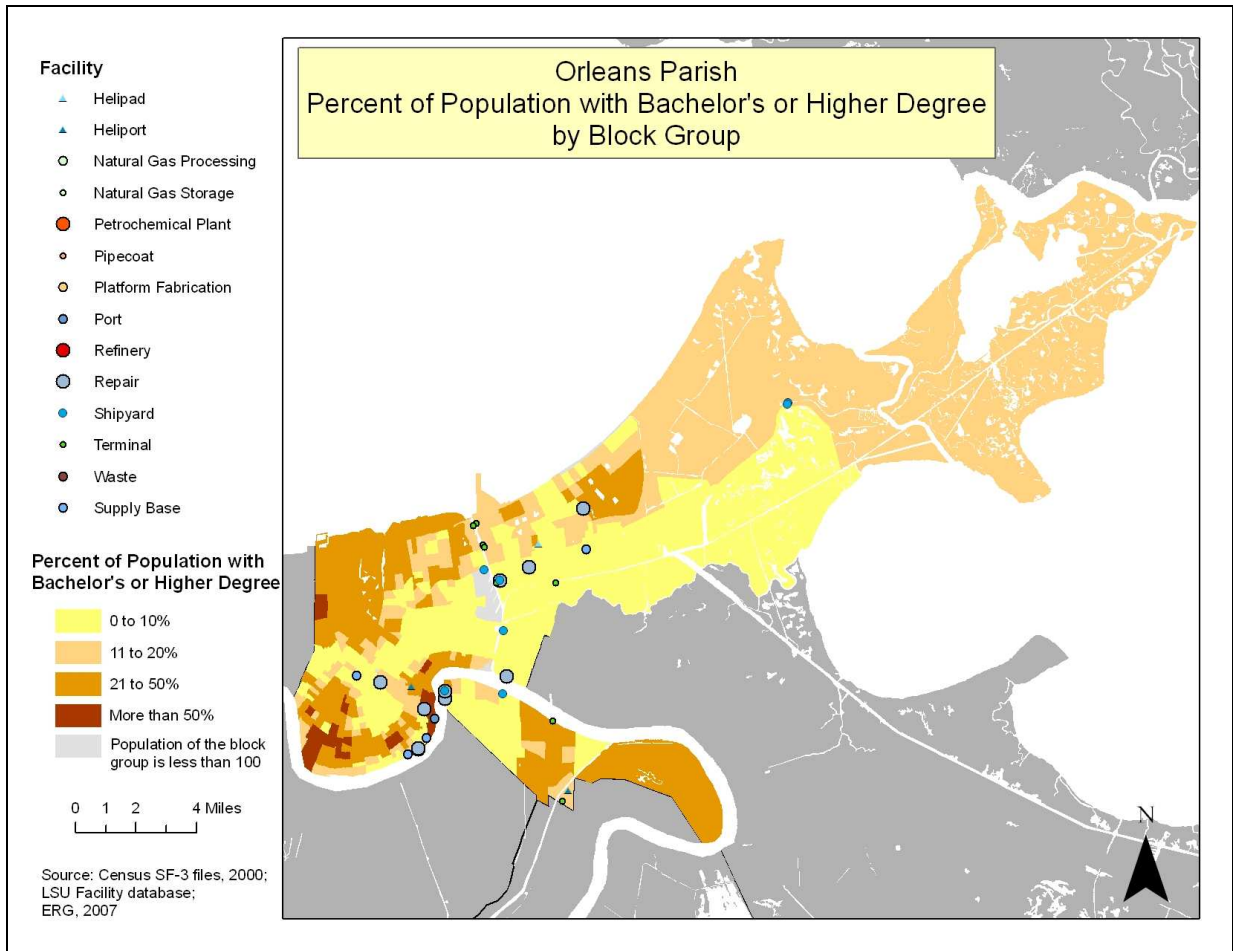


Figure 42. Orleans Parish—percent population with bachelor's degree or higher.

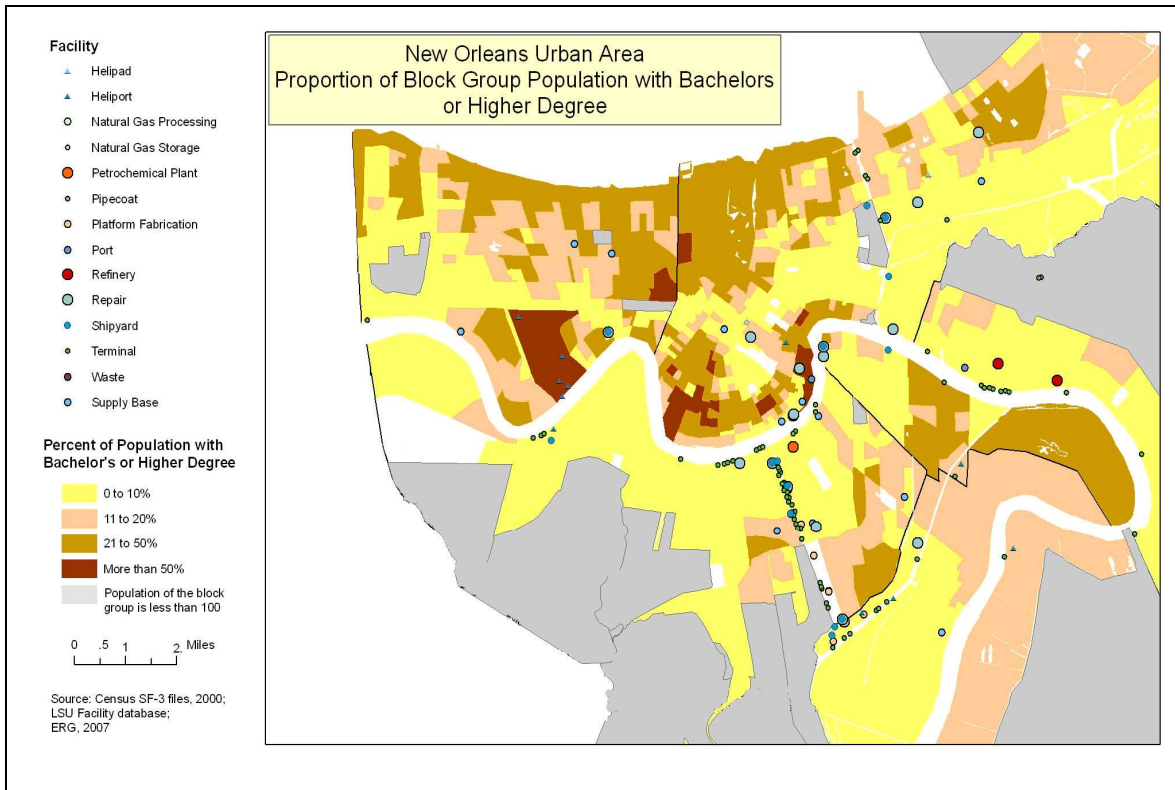


Figure 43. New Orleans MSA—percent population with bachelor’s degree or higher.

Table 54 summarizes the educational attainment for Orleans Parish from 1940-2000. In 2005, about 31.4 percent of the adult population held a bachelor’s degree or higher and about 82 percent had completed high school (USDOD, Census, 2007).

Table 54.

Educational Attainment of Adults (age 25+), Orleans Parish: 1940-2000

Year	Educational Attainment of Adults					Ratio to State	
	0-8 years	Some High School	High School Diploma	Some College, No Degree	BA/BS or more	High School Diploma	BA/BS or more
2000	8%	17%	23%	22%	26%	0.71	1.39
1990	13%	19%	24%	22%	22%	1.00	1.39
1980	24%	17%	27%	14%	18%	1.03	1.27
1970	38%	20%	23%	9%	11%	1.00	1.19
1960	50%	17%	19%	7%	8%	1.03	1.15
1950	56%	14%	17%	6%	6%	1.32	1.30
1940	67%	11%	13%	4%	5%	1.24	1.34

Source: USDOD, Census, 2000b.

9.7.3. Health and Welfare

As of August 2006, three hospitals were open in Orleans Parish and seven were closed (LRA, 2006). Pharmacies are reinvesting and rebuilding (O'Brien, 2007).

9.7.4. Recreation

Recreational facilities are still undergoing restoration after the hurricanes. New Orleans held its world-famous Mardi Gras in both 2006 and 2007.

9.7.5. Religion

In 2000, 208,876 of Orleans Parish residents claimed a religious affiliation. Sixty-five percent identified as Catholic, 13 percent as Baptist, and 21 percent as belonging to "other" denominations or religions (ARDA, 2006d).

9.8. Impacts from Hurricane Katrina and OCS-Related Infrastructure

Orleans Parish ranks 8th in terms of concentration of OCS-related infrastructure with:

- 1 port
- 8 terminals
- 7 shipyards
- 10 ship repair facilities
- 4 supply bases
- 3 heliports/helipads

The Port of New Orleans has recovered (Port of New Orleans, 2006a). New Orleans is home to at least eight offshore oil and gas companies that needed to evacuate during the storm. They have since returned to New Orleans: Cimarex Energy Co., Coldren Oil & Gas, Dominion Exploration & Production, Helis Oil & Gas Company, McMoRan Oil and Gas LLC, Shell-GOM Production, Taylor Energy, and Virgin Oil Company. Chevron is working out of Madisonville, Louisiana. CLK Energy Partners is operating out of Houston. Energy Partners is back in New Orleans but will maintain a Houston office. Linder Oil Company is operating out of Covington, Louisiana. Murphy Exploration and Production relocated its office to Lafayette. W&T Offshore is operating out of Houston and Zot Oil and Gas relocated to Metairie (OCSBBS, 2006). As noted in Section 9.5.2, the oil and gas industry underwent some of the smallest losses in employment in the parish.

9.9. Issues of Concern

The Parish of Orleans is grappling with failed infrastructure and a loss of nearly half its population more than a year and a half after Katrina. More than 15 months passed before a manager was chosen to coordinate the recovery (Bohrer, 2006). Construction of the bridge across Lake Pontchartrain began only in December 2006 (Bergeron, 2006).

10. REFERENCES

- AirNav.com. 2006. Texas airports, Houston. Internet website: <http://www.airnav.com/airports/us/TX>.
- Aldridge, J. 2003. Tesoro completes sale of marine services subsidiary. San Antonio Business Journal. December 23. Internet website: <http://sanantonio.bizjournals.com/sanantonio/stories/2003/12/22/daily19.html>.
- Amtrak. 2009. Amtrak: Gulf Coast service plan report. Internet website: http://www.amtrak.com/servlet/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1249200491159&blobheader=application%2Fpdf&blobheadername1=Content-disposition&blobheadervalue1=attachment;filename=Amtrak_GulfCoastServicePlanReport.pdf.
- Applebome, P., R. Lyman, and W. Yardley. 2005. Storm and crisis: The overview; Relieved Texans returning home as storm fades. The New York Times. September 26. Page A1.
- Association of Religion Data Archives (ARDA). 2006a. Association of Religion Data Archives. County membership report. Harris County, Texas. Internet website: http://thearda.com/mapsReports/reports/counties/48201_2000.asp.
- Association of Religion Data Archives (ARDA). 2006b. Association of Religion Data Archives. County membership report. Jefferson County, Texas. Internet website: http://thearda.com/mapsReports/reports/counties/48245_2000.asp.
- Association of Religion Data Archives (ARDA). 2006c. Association of Religion Data Archives. County membership report. Jefferson Parish, Louisiana. Internet website: http://thearda.com/mapsReports/reports/counties/22051_2000.asp.
- Association of Religion Data Archives (ARDA). 2006d. Association of Religion Data Archives. County membership report. Orleans Parish, Louisiana. Internet website: http://thearda.com/mapsReports/reports/counties/22071_2000.asp.
- Association of Religion Data Archives (ARDA). 2006e. Association of Religion Data Archives. County membership report. Plaquemines Parish, Louisiana. Internet website: http://thearda.com/mapsReports/reports/counties/22075_2000.asp.
- Association of Religion Data Archives (ARDA). 2006f. Association of Religion Data Archives. County membership report. St. Bernard Parish, Louisiana. Internet website: http://thearda.com/mapsReports/reports/counties/22087_2000.asp.
- Barras, J.A. 2006. United States Geological Survey. National Wetlands Research Center. Land area changes in coastal Louisiana after the 2005 hurricanes. Internet website:

http://www.nwrc.usgs.gov/hurricane/landchange2005/CWPPRA_hurricanepres_10-18-06_vid_final.pdf.

Barras, J., S. Beville, D. Britsch, S. Hartley, S. Hawes, J. Johnston, P. Kemp, Q. Kinler, A. Martucci, J. Porthouse, D. Reed, K. Roy, S. Sapkota, and J. Suhayda. 2004. Historical and projected coastal Louisiana land changes: 1978-2050. USGS Open File Report OFR 03-334 (Revised January 2004). Internet website: <http://www.louisianaspeaks-parishplans.org/projectattachments/001246/NewHistoricalland.pdf>.

Baytown. 2006. City of Baytown, Texas. Economic development. Internet website: <http://www.baytown.org/business/ecodev>.

Bergeron, A. 2006. Louisiana's officials' goal is hurricane resistant bridge. Engineering News Record. December 11. Internet website: http://enr.ecnext.com/free-scripts/comsite2.pl?page=enr_document&article=netrar061211a.

Bohrer, B. 2006. Manager chosen for Katrina recovery. Boston Globe. December 5. Internet website: http://www.boston.com/news/nation/articles/2006/12/05/manager_chosen_for_katrina_recovery/.

Brookings Institute. 2006. The credit and insurance consequences of natural and man-made catastrophes. Internet website: <http://www.brookings.edu/~media/Files/events/2006/0907community%20development/20060907.pdf>.

Broussard, A. and J. Young. 2006. State of the Parish. November 29. Internet website: <http://www.jeffparish.net/downloads/3753/4189-StateOfParishNov292006.pdf>.

Brown, S.P., S.L. Mason, and R.B. Tiller. 2006. The effect of Hurricane Katrina on employment and unemployment. Monthly Labor Review. August. Pp. 52-69.

Cahoon, L., D.E. Herz, R.C. Ning, A.E. Polivka, M.E. Reed, E.L. Robison, and G.D. Weyland. 2006. The Current Population Survey response to Hurricane Katrina. Monthly Labor Review. August. Pp. 40-50.

Chemtura Corporation. 2005. News release. Chemtura Corporation reports third quarter earnings. October 27. Internet website: http://media.corporate-ir.net/media_files/irol/68/68079/pdf/3Q05PressRelease_complete.pdf.

ChevronTexaco. 2005. ChevronTexaco: Press release. Chevron updates hurricane impacts. Internet website: http://investor.chevron.com/phoenix.zhtml?c=130102&p=irol-newsArticle_print&ID=753424&highlight.

Commissioners Court. 2005. Jefferson County, Texas - Commissioners Court. Management and performance review of county government operations in Jefferson County, Texas.

- July 18, 2005. Internet website:
http://www.co.jefferson.tx.us/comm crt/mgt/MGT_Study.pdf.
- ConocoPhillips. 2006a. ConocoPhillips. News center. ConocoPhillips directs \$8 million to Louisiana communities. July 10. Internet website:
http://www.conocophillips.com/EN/newsroom/news_releases/2006news/Pages/07-10-2006.aspx.
- ConocoPhillips. 2006b. ConocoPhillips. Investor relations. SEC filings. Form 8-K filed: July 26, 2006. Internet website:
http://www.conocophillips.com/EN/investor/financial_reports/sec_filings/Pages/index.aspx.
- ConocoPhillips. 2006c. ConocoPhillips. Energy investments for the future. 2005 annual report. Internet website:
http://www.conocophillips.com/EN/about/company_reports/annual_report/Documents/2005%20Annual%20Report.pdf.
- Dokken, Q.R., H.B. Lovett, T. Ozuna, B.I. Ponwith, E. Ozuna, and L. Centeno. 1998. Texas fisheries economic development report. Center for Coastal Studies, Texas A&M University. Corpus Christi.
- Entergy. 2007a. Entergy. Jefferson Parish profile. Internet website:
http://www.energylouisiana.com/Global/Documents/Louisiana/Economic_Development/Jefferso2_parish.pdf.
- Entergy. 2007b. Entergy. Orleans Parish profile. Internet website:
http://www.energylouisiana.com/Global/Documents/Louisiana/Economic_Development/Orleans2.pdf.
- Entergy. 2007c. Entergy. St. Bernard Parish profile. Internet website:
http://www.energylouisiana.com/Global/Documents/Louisiana/Economic_Development/StBernard2_parish.pdf.
- Enterprise Products Partners, L.P. (EPP). 2005. Enterprise Products Partners, L.P. News release. Enterprise completes repairs to Toca natural gas processing plant. November 30. Internet website: <http://phx.corporate-ir.net/phoenix.zhtml?c=80547&p=irol-newsArticle&ID=791560&highlight>.
- ExxonMobil. 2005. ExxonMobil. 2005 corporate citizenship report. Internet website:
http://www.exxonmobil.com/Corporate/Files/Corporate/ccr05_fullreport.pdf.
- Federal Energy Regulatory Commission (FERC). 2005. FERC: LNG – Golden Pass FEIS. Internet website: <http://www.ferc.gov/industries/gas/enviro/eis/2005/06-03-05-eis.asp>.
- Finch, S. 2007. Judge favors settlement in St. Bernard oil spill. The Times Picayune. January 5.

- Fowler, T. 2005. Katrina's aftermath: A long, slow comeback. Overcoming great destruction requires great effort, and workers struggle to get Louisiana refineries going again. Houston Chronicle. November 26. Internet website: <http://www.chron.com/disp/story.mpl/special/05/katrina/3484825.html>.
- FoxNews.com. 2006. Katrina evacuees' welcome wearing thin in Houston. March 29. Internet website: http://www.foxnews.com/printer_friendly_story/0,3566,189554,00.html.
- Garber, M., L. Unger, J. White, and L. Wohlford. 2006. Hurricane Katrina's effects on industry employment and wages. Monthly Labor Review 129(8):22-39.
- GlobalSecurity.org. 2007a. Louisiana – U.S. military facilities. Internet website: <http://www.globalsecurity.org/military/facility/louisiana.htm>.
- GlobalSecurity.org. 2007b. NAS JRB New Orleans. Internet website: <http://www.globalsecurity.org/military/facility/nas-jrb-no.htm>.
- Greater New Orleans Community Data Center (GNOCDC). 2007. Public school enrollment 2000-2006. Internet website: http://gnocdc.org/school_enrollment.html.
- Griffith, C. R. 2005. Jefferson County Judge. Mandatory evacuation order. Internet website: <http://www.co.jefferson.tx.us/em.htm>.
- Harris County Park System. 2006. Harris County park system. Internet website: <http://www.hctx.net/parks/park.asp>.
- Harris County Sheriff's Office. 2006. Harris County sheriff's office. Internet website: <http://www.hcso.hctx.net/>.
- Harris County Tax Office. 2005. Press release. Harris County Tax Office. Official damage estimate for Hurricane Rita is \$111 million. Harris County Appraisal District says majority of damage is to business inventory. September 29. Internet website: http://www.tax.co.harris.tx.us/News/pressreleaseForm.aspx?inputName=2005/misc/Rita_Damage_09292005.aspx.
- Harris County, Texas. 2003. Harris County information. Internet website: <http://www.co.harris.tx.us>.
- Harris County, Texas. 2005. Harris County community services dept. Internet website: <http://www.cedd.hctx.net/>.
- Impact Assessment, Inc. (IAI). 2004. Parish profiles for the State of Louisiana: Plaquemines Parish. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA.

- Impact Assessment, Inc. (IAI). 2005. Identifying communities associated with the fishing industry in Texas. Final report. Volume I. Internet website: http://sero.nmfs.noaa.gov/economics/pdf/Texas_collapsed-Feb06.pdf.
- InfoUSA. 2006. InfoUSA database. Internet website: <http://www.infousa.com/>.
- Internet Over Houston. 2006. Houston tv & radio. Internet website: <http://www.houstonet.com/tv/tvradio.html>.
- Isaacs, J.C. and Y.N. Chi. 2006. The economic contributions of two saltwater angling tournaments: The case of the Faux Pas and R.F.R.I. fishing rodeos in Plaquemines Parish, Louisiana. Internet website: <http://media.wlf.state.la.us/pdfs/education/fishingrodeo.pdf>.
- Jefferson County, Texas. 2003. History of Jefferson County, TX. Internet website: http://www.co.jefferson.tx.us/Historical_Commission/hist.htm.
- Jefferson County, Texas. 2007. Jefferson County, Texas: Economic development. Internet website: http://www.co.jefferson.tx.us/eco_dev/eco_dev_2010.htm.
- Jefferson Parish. 2005a. News release. Jefferson Parish Department of Public Information. Hurricane Katrina advisory 16. August 30. Information from Jefferson Parish regarding Hurricane Katrina. Internet website: http://www.jeffparish.net/downloads/4440/4457-KATRINA_16_Info.pdf.
- Jefferson Parish. 2005b. News release. Jefferson Parish Department of Public Information. Hurricane Rita Advisory 4. September 22. Evacuation upgraded from voluntary to mandatory Jean Lafitte, Crown Point, and Barataria. Internet website: http://www.jeffparish.net/downloads/4440/4547-RITA_4_MANDATORY_EVACUATION.pdf.
- Jefferson Parish. 2007. Jefferson Parish. Internet website: <http://jeffparish.net/index.cfm>.
- Kids Count. 2006. Kids Count data center. Internet website: <http://datacenter.kidscount.org/>.
- Kieper, M. 2006. Weather underground. Katrina's storm surge. Internet website: <http://www.wunderground.com/hurricane/Katrinassurgecontents.asp>.
- Knabb, R.D., D.P. Brown, and J.R. Rhome. 2006a. National Hurricane Center. Tropical cyclone report: Hurricane Rita September 18-26, 2005. Internet website: http://www.nhc.noaa.gov/pdf/TCR-AL182005_Rita.pdf.
- Knabb, R.D., J.R. Rhome, and D.P. Brown. 2006b. National Hurricane Center. Tropical cyclone report Hurricane Katrina August 23-30, 2005. Internet website: http://www.nhc.noaa.gov/pdf/TCR-AL122005_Katrina.pdf.

- Lane, J., K.J. Dwyer, D. Thompson, R. Cowles, A. Sanders, C. Rappleye, and R. Nelson. 2005. Golden triangle damage by county. Houston Chronicle. September 29. Internet website: http://www.chron.com/CDA/archives/archive.mpl?id=2005_3907040.
- Lee, S. 2006. HBO documentaries. When the levees broke: A requiem in four acts. Internet website: <http://www.hbo.com/documentaries/when-the-levees-broke-a-requiem-in-four-acts/index.html#>.
- Levin, A. and P. Eisler. 2005. USA TODAY. Many decisions led to failed levees. Internet website: http://www.usatoday.com/news/nation/2005-11-03-levees-failure_x.htm.
- Louis Berger Group, Inc. 2004. OCS-related infrastructure in the Gulf of Mexico fact book. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 2004-027. 249 pp.
- Louisiana Dept. of Culture, Recreation, and Tourism (LA CRT). 2006. Louisiana Dept. of Culture, Recreation, and Tourism. Report of accomplishments January 2005 – June 2006. Internet website: <http://www.crt.state.la.us/documentarchive/AnnualReport/2006AnnualReport.pdf>.
- Louisiana Dept. of Culture, Recreation, and Tourism (LA CRT). 2007. Louisiana Dept. of Culture, Recreation, and Tourism. Louisiana rebirth scorecard. Internet website: <http://www.crt.state.la.us/DocumentArchive/Rebirth/LouisianaRebirthUpdate20070110.pdf>.
- Louisiana Dept. of Health and Hospitals (LDHH). 2006. Louisiana Dept. of Health and Hospitals. 2005 Louisiana health report card. Internet website: <http://www.dhh.louisiana.gov/offices/publications/pubs-275/2005%20Health%20Report%20Card.pdf>.
- Louisiana Dept. of Natural Resources (LDNR). 2001. Coastal Management Division. Gulf ecological management site. Big Oak Island. Internet website: <http://dnr.louisiana.gov/crm/coastmgt/gems/bigoakis.htm>.
- Louisiana Recovery Authority (LRA). 2006. Louisiana remembrance & rebirth. Hurricane Katrina anniversary data for Louisiana. August 20. Internet website: <http://lra.louisiana.gov/assets/docs/searchable/LouisianaKatrinaAnniversaryData082206.pdf>.
- Louisiana Speaks (LS). 2006. Louisiana Speaks: Long-term community recovery planning. Plaquemines Parish: What happened. Internet website: http://www.louisianaspeaks-parishplans.org/IndParishHomepage_BaselineWhatHappened.cfm?EntID=12.
- Louisiana Speaks (LS). 2007. Louisiana speaks: Long-term community recovery planning. Jefferson Parish: What happened. Internet website: http://www.louisianaspeaks-parishplans.org/IndParishHomepage_BaselineWhatHappened.cfm?EntID=8.

- Louisiana State University. Agricultural Center (LSU, AgCenter). 2005. Questions remain after storms batter the coast. Internet website: <http://www.seagrantfish.lsu.edu/resources/fins/2005/10-05.htm>.
- Louisiana State University. Agricultural Center (LSU, AgCenter). 2006. Fisheries industries rebounding at different paces. Internet website: http://www.lsuagcenter.com/news_archive/2006/august/headline_news/Fisheries+Industries+Rebounding+At+Different+Paces.htm.
- Louisiana Technical College (LTC). 2007. Louisiana Technical College. Internet website: <http://www.ltc.edu/>.
- Mack, K. 2005. Most say they'd evacuate again. Houston Chronicle. November 10. Internet website: <http://www.chron.com/disp/story.mpl/special/05/rita/3384384.html>.
- Murphy Oil Corporation. 2006. Murphy Oil Corporation. 2005 annual report. Internet website: http://www.murphyoilcorp.com/ir/annualreport/2005/2005_MurphyAR.pdf.
- New Orleans Lakefront Airport. 2007. New Orleans lakefront airport. Internet website: <http://www.lakefrontairport.com/index.htm>.
- O'Brien, K. 2007. Big plans in the Big Easy. Boston Globe. February 18. pp. D1, D4.
- Outer Continental Shelf Bulletin Board Service (OCSBBS). 2006. Current status of displaced oil and gas concerns. Internet website: <http://www.ocsbbs.com/hottopic-show.asp?id=569&y=2006&pg=3>.
- Plaquemines Gazette. 2007. Plaquemines Gazette. Internet website: <http://plaqueminesgazette.com/>.
- Plaquemines Parish. 2007. Plaquemines Parish government. Internet website: <http://www.plaqueminesparish.com>.
- Plaquemines Parish School Board (PPSB). 2006. Plaquemines Parish school board. Internet website: <http://www.ppsb.org/>.
- Port Arthur News. 2002. Port Arthur. 2002-2003 regional directory and fact book. Port Arthur, TX.: The News Publishing Co.
- Port of Houston Authority. 2006. General information: Overview. Internet website: <http://www.portofhouston.com/geninfo/overview1.html>.
- Port of New Orleans. 2006a. Port of New Orleans. Port exceeds pre-Katrina tonnage levels: Cruise industry set to return in October. Internet website: <http://63.243.21.112:8083/prsrel082206.pdf>.

- Port of New Orleans. 2006b. Port Record. A new day: Cruising returns to New Orleans. Internet website: <http://www.portno.com/pdfs/portrecord0906.pdf>.
- Port of New Orleans. 2007. Port of New Orleans overview. Internet website: http://portno.com/pno_pages/about_overview.htm.
- Rio Grande Pacific Corporation. 2007. New Orleans and Gulf Coast railway company. Internet website: <http://www.rgpc.com/nogcgeneralinformation.htm>.
- Shea, C. 2007. Group Study: Anthropologists studying post-Katrina New Orleans ask why some communities survived, and others washed away. Boston Globe. January 21. p. F-4. Internet website: http://www.boston.com/news/globe/ideas/articles/2007/01/21/group_study/.
- Simmons, A. M. 2007. Hispanics allege racial profiling in La.: Lawyers say law is used to target immigrants. Boston Globe. February 4. p. A15. Internet website: http://www.boston.com/news/nation/articles/2007/02/04/hispanics_allege_racial_profiling_in_la/.
- St. Bernard Parish Government. 2007. St. Bernard Parish: Tourism. Internet website: <http://www.visitstbernard.com/>.
- St. Bernard Parish.Net. 2007. St. Bernard Parish.net. An online guide to living in or visiting St. Bernard Parish, Louisiana: Profile. Internet website: <http://stbernardparish.net/profile.htm>.
- St. Bernard Port. 2005. St. Bernard Port & Terminal District. Hurricane Katrina update December 29, 2005. News release. Internet website: <http://www.stbernardport.com/home.htm>.
- Strayhorn, C.K. 2006. Office of the Texas comptroller. Quarterly sales tax historical data. Internet website: <http://ourcpa.cpa.state.tx.us/allocation/HistSales.jsp>.
- Terrell, D. and R. Bilbo. 2006. A report on the impact of Hurricanes Katrina and Rita on Louisiana businesses: 2005Q2-2006Q2. Internet website: <http://lra.louisiana.gov/assets/docs/searchable/Newsroom/2007/LouisianaBusinessRecoveryReport030807final.pdf>.
- Texas Association of Counties. 2004a. The county information project. Harris County profile. Internet website: <http://www.txcip.org/tac/census/profile.php?FIPS=48201>.
- Texas Association of Counties. 2004b. The county information project. Jefferson County profile. Internet website: <http://www.txcip.org/tac/census/profile.php?FIPS=48245>.
- Texas Center for Policy Studies. 2000. Texas environmental almanac. Second edition. Austin, TX.: University of Texas Press.

- Texas Commission on Environmental Quality (TCEQ). 2006a. Superfund sites in Harris County. Internet website: <http://www.tceq.state.tx.us/remediation/superfund/sites/county/harris.html>.
- Texas Commission on Environmental Quality (TCEQ). 2006b. Superfund sites in Jefferson County. Internet website: <http://www.tceq.state.tx.us/remediation/superfund/sites/county/jefferson.html>.
- Texas Commission on Fire Protection. 2006. Texas fire depts. Internet website: http://www.tcfp.state.tx.us/directory/TX_fire_depts.asp.
- Texas Dept. of State Health Services. 2006. Selected health facts 2002. Internet website: http://www.dshs.state.tx.us/borderhealth/pdf/2002_county_facts/Texas2002.pdf.
- Texas Dept. of Transportation (TxDOT). 2006. Motor carrier databases. http://www.txdot.gov/business/motor_carrier/databases.htm.
- Texas Education Agency. 2004. Snapshot 2004: School district profiles. Internet website: <http://ritter.tea.state.tx.us/perfreport/snapshot/2004/index.html>.
- Texas Education Agency. 2006. Texas education agency. Internet website: <http://www.tea.state.tx.us/>.
- TexasFreeway.com. 2006. Texas 87, High Island to Sabine Pass. Internet website: http://www.texasfreeway.com/statewide/Statewide/abandoned/TX87_closed/87_eroded.shtml.
- Texas Secretary of State. 2006. Office of the Secretary of State. 1992 – current election history. Internet website: <http://elections.sos.state.tx.us/elchist.exe>.
- Texas State Historical Association (TSHA). 2001. Handbook of Texas online. Internet website: <http://www.tshaonline.org/handbook>.
- Texas State Historical Association (TSHA). 2003. Texas almanac. Internet website: <http://www.texasalmanac.com>.
- Trotter, A. 2006. Bond ratings lowered for some Gulf Coast school districts. Education Week 25(18):12. Internet website: <http://www.edweek.org/ew/articles/2006/01/11/18bonds.h25.html>.
- Union Pacific. 2007. New Orleans and Gulf Coast Railway Company. Internet website: <http://www.uprr.com/customers/shortline/lines/nogc.shtml>.
- University of Phoenix. 2007. Louisiana campus: Metairie. Internet website: <http://www.phoenix.edu/campus-locations/la/louisiana-campus/louisiana-campus.html>.

- U.S. Dept. of Commerce. Bureau of Economic Analysis (USDOC, BEA). 2003. BEA: Regional economic accounts. Local area bearfacts. Internet website: <http://www.bea.gov/regional/bearfacts/countybf.cfm>.
- U.S. Dept. of Commerce. Bureau of Economic Analysis (USDOC, BEA). 2005. BEA: Regional economic accounts. Local area personal income. Table CA06N NAICS (2001-2008): Compensation by industry. Internet website: <http://www.bea.gov/regional/reis/default.cfm?selTable=CA06N&series=NAICS>.
- U.S. Dept. of Commerce. Bureau of Economic Analysis (USDOC, BEA). 2006. BEA: Regional economic accounts. Local area personal income. Table CA05N NAICS (2001-2008): Personal income and detailed earnings by industry. Internet website: <http://www.bea.gov/regional/reis/default.cfm?selTable=CA05N&series=NAICS>.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2000a. American factfinder. Fact sheet. Jefferson Parish. 2000 data. Internet website: http://factfinder.census.gov/servlet/SAFFFacts?_event=ChangeGeoContext&geo_id=05000US22051&geoContext=01000US&street=&county=Jefferson&cityTown=Jefferson&state=04000US22&zip=&lang=en&sse=on&ActiveGeoDiv=&useEV=&pctxt=fph&pgsl=010&submenuId=factsheet_1&ds_name=DEC_2000_SAFF&ci_nbr=null&q_r_name=null®=null%3Anull&keyword=&industry.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2000b. American factfinder. Fact sheet. Orleans Parish. 2000 data. Internet website: http://factfinder.census.gov/servlet/SAFFFacts?_event=ChangeGeoContext&geo_id=05000US22071&geoContext=01000US&street=&county=Orleans&cityTown=Orleans&state=04000US22&zip=&lang=en&sse=on&ActiveGeoDiv=geoSelect&useEV=&pctxt=fph&pgsl=010&submenuId=factsheet_1&ds_name=DEC_2000_SAFF&ci_nbr=null&q_r_name=null®=null%3Anull&keyword=&industry.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2000c. American factfinder. Fact sheet. Plaquemines Parish. 2000 data. Internet website: http://factfinder.census.gov/servlet/SAFFFacts?_event=Search&geo_id=&geoContext=&street=&county=Plaquemines&cityTown=Plaquemines&state=04000US22&zip=&lang=en&sse=on&pctxt=fph&pgsl=010&show_2003_tab=&redirect=Y.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2000d. American factfinder. Fact sheet. St. Bernard Parish. 2000 data. Internet website: http://factfinder.census.gov/servlet/SAFFFacts?_event=Search&geo_id=05000US22075&geoContext=01000US|04000US22|05000US22075&street=&county=saint+bernard&cityTown=saint+bernard&state=04000US22&zip=&lang=en&sse=on&ActiveGeoDiv=geoSelect&useEV=&pctxt=fph&pgsl=050&submenuId=factsheet_1&ds_name=DEC_2000_SAFF&ci_nbr=null&q_r_name=null®=null%3Anull&keyword=&industry=Y.

- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2003. County business patterns. Internet website: <http://censtats.census.gov/cbpnaic/cbpnaic.shtml>.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2005a. American factfinder. Fact sheet. Harris County, Texas. Internet website: http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=Search&geo_id=&geoContext=&street=&county=harris&cityTown=harris&state=04000US48&zip=&lang=en&_sse=on&pctxt=fph&pgsl=010.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2005b. American factfinder. Fact sheet. Jefferson County, Texas. Internet website: http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=Search&geo_id=05000US48201&geoContext=01000US%7C04000US48%7C05000US48201&street=&county=jefferson&cityTown=jefferson&state=04000US48&zip=&lang=en&_sse=on&ActiveGeoDiv=geoSelect&useEV=&pctxt=fph&pgsl=050&submenuId=factsheet_1&ds_name=ACS_2005_SAFF&ci_nbr=null&qtr_name=null®=null%3Anull&keyword=&industry.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2005c. Population estimates data sets. Internet website: <http://www.census.gov/popest/datasets.html>.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2005d. State & county quickfacts. Jefferson Parish, Louisiana. Internet website: <http://quickfacts.census.gov/qfd/states/22/22051.html>.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2005e. State & county quickfacts. Orleans Parish, Louisiana. Internet website: <http://quickfacts.census.gov/qfd/states/22/22071.html>.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2005f. State & county quickfacts. Plaquemines Parish, Louisiana. Internet website: <http://quickfacts.census.gov/qfd/states/22/22075.html>.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2005g. State & county quickfacts. St. Bernard Parish, Louisiana. Internet website: <http://quickfacts.census.gov/qfd/states/22/22087.html>.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2006a. ArcData: Download Census 2000 Tiger/Line data.. Internet website: http://arcdata.esri.com/data/tiger2000/tiger_download.cfm.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2006b. Census data & emergency preparedness: Special population estimates for impacted counties in the Gulf Coast area. Internet website: http://www.census.gov/newsroom/emergencies/additional/impacted_gulf_estimates.html.

- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2006c. Jefferson Parish, Louisiana. General demographic characteristics: 2005. Internet website: http://factfinder.census.gov/servlet/ADPTable?_bm=y&-geo_id=05000US22051&-context=adp&-ds_name=ACS_2005_EST_G00_&-tree_id=305&-lang=en&-caller=geoselect&-format.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2006d. New Orleans-Metairie-Kenner, LA metro area. General demographic characteristics: 2005. Internet website: http://factfinder.census.gov/servlet/ADPTable?_bm=y&-context=adp&-qr_name=ACS_2005_EST_G00_DP1&-ds_name=ACS_2005_EST_G00_&-tree_id=305&-redoLog=true&-caller=geoselect&-geo_id=31000US35380&-format=&-lang=en.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2006e. St. Bernard Parish, Louisiana. General demographic characteristics: 2005. Internet website: http://factfinder.census.gov/servlet/ADPTable?_bm=y&-context=adp&-qr_name=ACS_2005_EST_G00_DP1&-ds_name=ACS_2005_EST_G00_&-tree_id=305&-redoLog=false&-caller=geoselect&-geo_id=05000US22087&-format=&-lang=en.
- U.S. Dept. of Commerce. Bureau of the Census (USDOC, Census). 2007. Orleans Parish, Louisiana. General demographic characteristics: 2005. Internet website: http://factfinder.census.gov/servlet/ADPTable?_bm=y&-context=adp&-qr_name=ACS_2005_EST_G00_DP1&-ds_name=ACS_2005_EST_G00_&-tree_id=305&-redoLog=true&-caller=geoselect&-geo_id=05000US22071&-format=&-lang=en.
- U.S. Dept. of Commerce. National Marine Fisheries Service (USDOC, NMFS). 2006. NOAA: National Marine Fisheries Service. Fisheries of the Caribbean, Gulf of Mexico, and South Atlantic; Shrimp fishery of the Gulf of Mexico; Amendment 13. Federal Register 71 FR 56039-56047. September 26. Internet website: <http://www.federalregister.gov/articles/2006/09/26/06-8257/fisheries-of-the-caribbean-gulf-of-mexico-and-south-atlantic-shrimp-fishery-of-the-gulf-of-mexico>.
- U.S. Dept. of Commerce. National Marine Fisheries Service (USDOC, NMFS). 2007. NOAA: National Marine Fisheries Service. Fisheries of the United States 2005. Internet website: <http://www.st.nmfs.noaa.gov/st1/fus/fus05/index.html>.
- U.S. Dept. of Energy. Energy Information Administration (USDOE, EIA). 2005a. EIA: report 9/26/05. Hurricane impacts on U.S. oil & natural gas energy markets. Internet website: http://tonto.eia.doe.gov/oog/special/eia1_katrina_092605.html.
- U.S. Dept. of Energy. Energy Information Administration (USDOE, EIA). 2005b. EIA: report 9/28/05. Hurricane impacts on U.S. oil & natural gas energy markets. Internet website: http://tonto.eia.doe.gov/oog/special/eia1_katrina_092805.html.

- U.S. Dept. of Energy. Energy Information Administration (USDOE, EIA). 2005c. This week in petroleum Released on September 28, 2005. Internet website: <http://tonto.eia.doe.gov/oog/info/twip/twiparch/050928/twipprint.html>.
- U.S. Dept. of Energy. Energy Information Administration (USDOE, EIA). 2005d. EIA: report 12/27/05. Hurricane impacts on U.S. oil & natural gas energy markets. Internet website: http://tonto.eia.doe.gov/oog/special/eia1_katrina.html.
- U.S. Dept. of Energy. Office of Electricity Delivery and Energy Reliability (USDOE, OE). 2005. Gulf Coast hurricanes. Gulf Coast situation reports. Internet website: http://www.oe.netl.doe.gov/hurricanes_emer/gulf_coast.aspx.
- U.S. Dept. of Energy. Office of Electricity Delivery and Energy Reliability (USDOE, OE). 2006. Final Gulf Coast hurricanes situation report (#46). January 26. Internet website: www.oe.netl.doe.gov/docs/gulf_coast/gulf_012606_1500.pdf.
- U.S. Dept. of Homeland Security. Federal Emergency Management Agency (USDHS, FEMA). 2006a. FEMA: About Hurricane Katrina. Internet website: http://www.fema.gov/hazard/flood/recoverydata/katrina/katrina_about.shtm.
- U.S. Dept. of Homeland Security. Federal Emergency Management Agency (USDHS, FEMA). 2006b. FEMA: Hurricane Katrina flood recovery maps. Internet website: http://www.fema.gov/hazard/flood/recoverydata/katrina/katrina_la_about.shtm.
- U.S. Dept. of Homeland Security. Federal Emergency Management Agency (USDHS, FEMA). 2006c. FEMA: Hurricane Rita flood recovery maps. Internet website: http://www.fema.gov/hazard/flood/recoverydata/rita/rita_la_about.shtm.
- U.S. Dept. of Homeland Security. Federal Emergency Management Agency (USDHS, FEMA). 2006d. Hurricane Katrina surge inundation and advisory base flood elevation maps: Summary of methods. Internet website: http://www.fema.gov/pdf/hazard/flood/recoverydata/katrina/katrina_la_methods_v3.pdf.
- U.S. Dept. of Housing and Urban Development. Office of Policy Development and Research (HUD, PD&R). 2006. Current housing unit damage estimates: Hurricanes Katrina, Rita, and Wilma. Revised April 7. Internet website: http://gnocdc.s3.amazonaws.com/reports/Katrina_Rita_Wilma_Damage_2_12_06_revised.pdf.
- U.S. Dept. of Labor. Bureau of Labor Statistics (USDOL, BLS). 2006a. Local area unemployment statistics. Houston-Sugarland-Baytown, TX. MSA. Series ID: LAUMT48264203. Internet website: <http://data.bls.gov:8080/PDQ/outside.jsp?survey=la>.

- U.S. Dept. of Labor. Bureau of Labor Statistics (USDOL, BLS). 2006b. Local area unemployment statistics. Jefferson County, TX. Series ID: LAUCN48245003. Internet website: <http://data.bls.gov:8080/PDQ/outside.jsp?survey=la>.
- U.S. Dept. of Labor. Bureau of Labor Statistics (USDOL, BLS). 2006c. Local area unemployment statistics. Texas: Statewide data. Internet website: <http://data.bls.gov:8080/PDQ/outside.jsp?survey=la>.
- U.S. Dept. of Labor. Bureau of Labor Statistics (USDOL, BLS). 2007a. Local area unemployment statistics. Jefferson Parish, LA. Series ID: LAUPS22015003. Internet website: <http://data.bls.gov/cgi-bin/srgate>.
- U.S. Dept. of Labor. Bureau of Labor Statistics (USDOL, BLS). 2007b. Local area unemployment statistics. Orleans Parish, LA. Series ID: LAUPS22020003. Internet website: <http://data.bls.gov/cgi-bin/srgate>.
- U.S. Dept. of Labor. Bureau of Labor Statistics (USDOL, BLS). 2007c. Local area unemployment statistics. Plaquemines Parish, LA. Series ID: LAUCN22075003. Internet website: <http://data.bls.gov/cgi-bin/srgate>.
- U.S. Dept. of Labor. Bureau of Labor Statistics (USDOL, BLS). 2007d. Local area unemployment statistics. St. Bernard Parish, LA. Series ID: LAUPA22045003. Internet website: <http://data.bls.gov/cgi-bin/srgate>.
- U.S. Dept. of the Interior. U.S. Fish and Wildlife Service (USDOI, USFWS). 2006a. Bayou Sauvage National Wildlife Refuge. Internet website: <http://www.fws.gov/refuges/profiles/index.cfm?id=43595>.
- U.S. Dept. of the Interior. U.S. Fish and Wildlife Service (USDOI, USFWS). 2006b. Southeast Louisiana National Wildlife Refuges. Internet website: <http://www.fws.gov/southeastlouisiana/index.html>.
- U.S. Dept. of the Interior. U.S. Fish and Wildlife Service (USDOI, USFWS). 2007. Breton National Wildlife Refuge. Internet website: <http://www.fws.gov/refuges/profiles/index.cfm?id=43556>.
- U.S. Dept. of the Interior. U.S. Geological Survey (USDOI, USGS). 2003. 100+ years of land change for Southeast Coastal Louisiana. Internet website: <http://www.nwrc.usgs.gov/upload/landloss8X11.pdf>.
- U.S. Environmental Protection Agency. Office of Environmental Information (USEPA, OEI). 2001. The Emergency Planning and Community Right-to-Know Act: Section 313 Release and Other Waste Management Reporting Requirements. EPA 260/K-01-001. February. Internet website: http://www.epa.gov/tri/guide_docs/pdf/2000/brochure2000.pdf.

- U.S. Environmental Protection Agency (USEPA). 2006a. Envirofacts: Your one-stop source for environmental information. Internet website: <http://www.epa.gov/enviro/>.
- U.S. Environmental Protection Agency (USEPA). 2006b. EPA TRI Explorer. Chemical report. Internet website: <http://www.epa.gov/triexplorer/>.
- U.S. Environmental Protection Agency (USEPA). 2006c. Green book: The green book nonattainment areas for criteria pollutants. Internet website: <http://www.epa.gov/oaqps001/greenbk/index.html>.
- U.S. Environmental Protection Agency (USEPA). 2006d. Toxics Release Inventory (TRI) program. TRI program fact sheet. Internet website: http://www.epa.gov/tri/triprogram/tri_program_fact_sheet.htm.
- U.S. Environmental Protection Agency (USEPA). 2006e. Toxics Release Inventory (TRI) program. What is the Toxics Release Inventory program? Internet website: <http://www.epa.gov/tri/triprogram/whatis.htm>.
- U.S. Office of Management and Budget (OMB). 1998. North American industry classification system manual: United States, 1997. U.S. Office of Management and Budget. Lanham, MD.: Bernan Press.
- Valero. 2006a. Valero Energy Corp. Form 10-K: For the fiscal year ended December 31, 2005. Internet website: <http://www.valero.com/Financial%20Documents/Form%2010-K%202005.pdf>.
- Valero. 2006b. Valero: Houston refinery. Internet website: <http://www.valero.com/OurBusiness/OurLocations/Refineries/Pages/Houston.aspx>.
- Valero. 2006c. Valero: Our business. Internet website: <http://www.valero.com/OurBusiness/Pages/Home.aspx>.
- Warren, B. 2007. New use urged for home slabs. The Times-Picayune. January 15. Internet website: <http://www.nola.com/news/t-p/frontpage/index.ssf?/base/news-19/1168843141257550.xml&coll=1>.
- Wieberg, S. and T. Frank. 2005. Stadium makes visitors as welcome as it can. USA Today. September 1. Internet website: http://www.usatoday.com/news/nation/2005-09-01-houston_x.htm.
- Wild American Shrimp. 2005. Media advisory: Status report on the domestic shrimp industry after Rita. Internet website: <http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=104&STORY=/www/story/09-28-2005/0004133733&EDATE>.