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WATER USE IN THE MISSISSIPPI GULF COAST COUNTIES, 1980

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by J. A. Callahan

ABSTRACT

The increase in population between 1975 and 1980 in the three Mississippi counties along the Gulf Coast has been accompanied by an increase in water use and the number of people served by public water-supply systems. Freshwater use increased from about 92.0 million gallons per day (Mgal/d) in 1975 to about 109 Mgal/d in 1980. In the same period, the number of people served by public water-supply systems increased from about 227,000 to nearly 253,000. Water use by public water-supply systems, all from ground-water sources, increased from about 27.6 Mgal/d to more than 31.3 Mgal/d, a gain of about 14 percent. Self-supplied industrial use of ground water decreased from about 18.4 to 17.7 Mgal/d, while the use of fresh surface water by self-supplied industries rose from about 42.3 to 56.1 Mgal/d. Industrial use of brackish surface water decreased from about 790 Mgal/d in 1975 to 660 Mgal/d in 1980.

INTRODUCTION

This report presents information on water use by public, self-supplied industrial, and rural systems in 1980 in Jackson, Harrison, and Hancock Counties, on Mississippi's Gulf Coast (fig. 1). The data were collected by the U.S. Geological Survey as part of a continuing program, begun in 1973, in cooperation with the Bureau of Land and Water Resources, Mississippi Department of Natural Resources. For comparative purposes, similar data from 1975 are included.

WATER SOURCES

Most public and rural water supplies in the three counties come from ground-water sources, and most industrial water supplies come from surface-water sources. Aquifers which supply water to wells in the area are, in order of decreasing depth and geologic age, the Pascagoula (Miocene), Graham Ferry (Pliocene), Citronelle (Pliocene-Pleistocene), and terrace and alluvial deposits (Pleistocene-Holocene). Quality of ground water is suitable for most uses, and it generally improves as the aquifers thicken and become progressively deeper to the west. Well depths range from 100 to 800 ft in Jackson County, and some wells in Hancock County exceed 2000 ft in depth.

WATER USE

Jackson County

Water use in Jackson County in 1980 averaged about 238 million gallons per day (Mgal/d), of which almost 160 Mgal/d (67 percent) was brackish surface water used for industrial purposes, and about 78 Mgal/d was freshwater (table 1). Fresh surface water, essentially all of it used by industry, accounted for about 56.1 Mgal/d (72 percent) of all freshwater used in the county. Ground-water use amounted to about 22.0 Mgal/d, of which 10.5 Mgal/d (48 percent), was used by customers of the various public supply systems.

The population served by public water systems in the county increased about 5 percent between 1975 and 1980, and potable water use increased about 18 percent. This represents a gain of 13 percent in per capita use. Self-supplied industries in the Pascagoula-Moss Point area used 4.7 Mgal/d of ground water and 25.6 Mgal/d of surface water in 1980; both figures were down slightly from 1975. These firms include paper mills, ship builders, chemical companies, fish meal and pet food manufacturers, and seafood processing and packaging plants. The Mississippi Power Company's new coal-fired generating plant, Plant Daniel, 5 miles north of Escatawpa, obtains its cooling water from on-site reservoirs supplied with water from Black Creek by the Jackson County Port Authority. The station also supplies raw water to the treatment plant at Bayou Cassotte industrial complex, where several petrochemical, agri-chemical, and refractory industries are located. The growing industrial area at Gautier houses the Ingalls Ship Building Yards, the Jackson County Port Authority, docking facilities, and grain elevators.

Harrison County

Water use in Harrison County in 1980 averaged about 528 Mgal/d, of which 502 Mgal/d (95 percent) was brackish surface water used for industrial purposes, and about 26 Mgal/d, virtually all of it ground water, was freshwater (table 2). About 19 Mgal/d (73 percent) of the ground water was used by public supply system customers.

Water used for public supply in the county increased from 1975 to 1980, but other categories of water use decreased in the same period. Biloxi is the home of Keesler Air Force Base, a Veterans Administration hospital, and light shipbuilding, steel, and other industries. Tourism and commercial fishing also contribute to Biloxi's economy. Gulfport has a high concentration of motels, commercial establishments, a Navy retirement home, a Veterans Administration hospital, and a Navy training base. The port is an important import-export center and is the banana importing point for the eastern United States. Gulfport Industrial Park houses chemical, steel, trailer manufacturing, and other plants.

Table 1.--Water use in Jackson County, Mississippi, 1975 and 1980

Location or System	Population Served		Average Daily Water Use in Thousands of Gallons						Per Capita Use in gal/d	
			Fresh Ground Water		Fresh Surface Water		Brackish Surface Water			
	1975	1980	1975	1980	1975	1980	1975	1980	1975	1980

PUBLIC SUPPLIES										
Gulf Coast Research Lab	130	60	154	65	0	0	0	0	1,185	1,083
Gulf Coast Junior College	900	200	43	55	0	0	0	0	48	275
Moss Point	20,700	21,200	1,694	1,865	0	0	0	0	82	88
Ocean Springs	13,635	14,500	881	1,379	0	0	0	0	65	95
Pascagoula	30,000	29,400	4,500	5,199	0	0	0	0	150	177
Bay Water Works	2,460	3,545	205	253	0	0	0	0	83	71
Hunt Water Company	280	a	20	a	0	0	0	0	71	a
Camp McClellan	90	90	10	10	0	0	0	0	111	111
Coast Water Works	2,620	1,545	157	92	0	0	0	0	60	60
Escatawpa	2,110	5,860	236	412	0	0	0	0	112	70
Gulf Park Estates	1,045	1,925	73	115	0	0	0	0	70	60
Martin Bluff	2,145	3,850	137	235	0	0	0	0	64	61
Northwood Utility	4,900	600	294	36	0	0	0	0	60	60
Pasco Utility	455	1,045	32	73	0	0	0	0	70	70
Point Porteaux	25	a	2	a	0	0	0	0	80	a
Seashore Utility	2,565	3,050	275	305	0	0	0	0	107	100
St. Andrews	490	510	34	123	0	0	0	0	69	241
Suburban Utility	2,085	2,625	125	158	0	0	0	0	60	60
Tucker Park	210	265	13	16	0	0	0	0	62	60
West Gate Utility	280	1,010	20	135	0	0	0	0	71	134
Subtotal	87,125	91,280	8,905	10,526	0	0	0	0	-	-

Table 1.--Continued

Location or System	Population Served		Average Daily Water Use in Thousands of Gallons						Per Capita Use in gal/d			
			Fresh Ground Water		Fresh Surface Water		Brackish Surface Water					
			1975	1980	1975	1980	1975	1980			1975	1980
SELF-SUPPLIED INDUSTRY												
Bayou Cassotte	-	-	4,096	3,320	0	0	58,000	158,620	-	-	-	
Gautier	-	-	766	1,933	0	0	0	0	-	-	-	
Moss Point-Pascagoula	-	-	5,710	4,711	27,534	25,570	486	1,068	-	-	-	
Escatawpa-Cumbest Bluff	-	-	0	158	14,815b	30,510b	0	0	-	-	-	
Subtotal	-	-	10,572	10,122	42,349	56,080	58,486	159,688	-	-	-	
RURAL DOMESTIC												
All rural users	12,515	27,025	615	1373	36	25	0	0	52	52	52	
TOTAL												
TOTAL	99,640	118,305	20,092	22,021	42,385	56,105	58,486	159,688	-	-	-	

a Assimilated by Ocean Springs Municipal System

b Water pumped by Jackson County Port Authority for Bayou Cassotte and Thermo Electric Power Plant

Table 2.--Water use in Harrison County, Mississippi, 1975 and 1980

Location or System	Population Served		Average Daily Water Use in Thousands of Gallons						Per Capita Use in gal/d	
			Fresh Ground Water		Fresh Surface Water		Brackish Surface Water			
	1975	1980	1975	1980	1975	1980	1975	1980	1975	1980

PUBLIC SUPPLIES										
Biloxi U.S. Naval Base Gulfport Keesler AFB Long Beach Pass Christian U.S. Naval Retirement Home Veterans Hospitals Ancient Oaks Balmoral Brentwood Utility Cedarlake Utilities Coast Water Works College Park Community Water System Crestview D'Iberville Fernwood Handsboro Dedaux Utility Mississippi Housing North Gulfport Waterworks Oakleigh Utility Orange Grove Utility Pass Christian Isle	40,200	49,310	5,000	5,328	0	0	0	0	124	108
	(5,000)a	(5,000)a	250	280	0	0	0	0	50	56
	48,500	50,700	4,896	5,710	0	0	0	0	101	113
	(30,000)b	(32,000)b	3,833	2,912	0	0	0	0	128	91
	9,800	8,750	740	1,393	0	0	0	0	76	159
	3,200	5,950	442	1,250	0	0	0	0	138	210
	-	300	-	98	0	0	0	0	-	327
	(1,670)c	c	266	c	0	0	0	0	159	c
	350	350	21	21	0	0	0	0	60	60
	180	d	13	d	0	0	0	0	72	d
	615	790	37	47	0	0	0	0	60	59
	e	180	e	12	0	0	0	0	e	67
	3,755	5,790	255	348	0	0	0	0	68	60
	2,540	f	194	f	0	0	0	0	76	f
	70	g	4	g	0	0	0	0	57	g
	540	570	34	40	0	0	0	0	63	70
	e	3,010	e	167	0	0	0	0	e	55
	75	65	6	5	0	0	0	0	80	77
	30	f	2	f	0	0	0	0	67	f
	1,475	2,625	94	169	0	0	0	0	64	64
3,245	1,345	178	81	0	0	0	0	55	60	
3,725	5,150	223	380	0	0	0	0	60	74	
555	965	33	58	0	0	0	0	59	60	
5,170	7,175	322	576	0	0	0	0	62	80	
960	675	68	47	0	0	0	0	71	70	

Table 2.--Continued

Location or System	Population Served		Average Daily Water Use in Thousands of Gallons						Per Capita Use in gal/d	
			Fresh Ground Water		Fresh Surface Water		Brackish Surface Water			
			1975	1980	1975	1980	1975	1980		
PUBLIC SUPPLIES--Continued										
Pine Point	120	105	10	7	0	0	0	0	83	67
Rivera	730	680	44	41	0	0	0	0	60	60
River Line Hills	e	20	e	2	0	0	0	0	e	100
Saucier	420	660	25	43	0	0	0	0	60	65
Seashore Utility	250	580	27	27	0	0	0	0	108	46
Turkey Creek	e	140	e	8	0	0	0	0	e	57
Ventures Utility	175	175	10	10	0	0	0	0	57	57
Westwick Utilities	1,030	2,115	70	127	0	0	0	0	68	60
Yucca Villa	55	65	3	5	0	0	0	0	54	77
Subtotal	127,765	148,240	17,100	19,192	0	0	0	0	-	-
SELF-SUPPLIED INDUSTRY										
Biloxi	-	-	2,996	2,019	0	0	0	0	-	-
Gulfport	-	-	2,723	2,712	0	0	733,000	502,000	-	-
Long Beach-Pass	-	-	0	304	0	0	0	0	-	-
Christian	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	5,719	5,035	0	0	733,000	502,000	-	-
RURAL DOMESTIC										
All rural users	11,540	11,950	2,571	1,578	60	37	0	0	223	132
TOTAL										
TOTAL	139,305	160,190	25,390	25,805	60	37	733,000	502,000	-	-

a Population counted in Gulfport total

b Population counted in Biloxi total

c 1975 Population counted in Biloxi and Gulfport total;

assimilated by Biloxi and Gulfport in 1980

d Assimilated by Pass Christian

e New System; not in service in 1975

f Assimilated by Gulfport

g Assimilated by D'Iberville

Hancock County

Water use in Hancock County in 1980 averaged about 4.8 Mgal/d. All water used was fresh; most was ground water, of which about 2.6 Mgal/d or 54 percent was used for industrial purposes and about 1.6 Mgal/d was used by public supply system customers (table 3).

Water used for all categories in the county increased between 1975 and 1980. The beach near Bay St. Louis and Waveland is a popular resort area, and businesses cater to summer residents and weekend visitors. Industrial use in the county is light, and the only self-supplied users are the government related industry at NASA Test Site and commercial fish production at Kiln.

SUMMARY

The counties along the Mississippi Gulf Coast have experienced an increase in population since 1975, which is reflected in a corresponding increase in water use for some categories (table 4). The population served by public water systems increased from 226,655 in 1975 to 252,890 in 1980, a 12 percent change. A comparison of the 1975 and 1980 water use totals for the area is as follows:

	<u>1975</u>	<u>1980</u>	<u>Percent</u> <u>Change</u>
Public supplies	27.57 Mgal/d	31.30 Mgal/d	+14
Self-supplied industry			
ground water	18.42 Mgal/d	17.73 Mgal/d	- 4
fresh surface-water	42.35 Mgal/d	56.08 Mgal/d	+32
brackish surface-water	791.49 Mgal/d	661.69 Mgal/d	-16
Rural domestic	3.65 Mgal/d	3.64 Mgal/d	0

Water use in the three counties averaged about 770 Mgal/d in 1980, of which 86 percent was brackish surface water used for industrial purposes in Harrison and Jackson Counties (table 4). Freshwater use in the counties averaged about 109 Mgal/d. The largest use of fresh surface water, 56.1 Mgal/d, was for industrial purposes in Jackson County. The largest use of fresh ground water, 31.3 Mgal/d, in the three-county area was for public water supplies. The use of ground water in Harrison County, 25.8 Mgal/d, was slightly larger than that in Jackson County and about 5 times the amount used in Hancock County (fig. 2).

Table 3.--Water use in Hancock County, Mississippi, 1975 and 1980

Location or System	Population Served		Average Daily Water Use in Thousands of Gallons						Per Capita Use in gal/d	
			Fresh Ground Water		Fresh Surface Water		Brackish Surface Water			
	1975	1980	1975	1980	1975	1980	1975	1980	1975	1980
PUBLIC SUPPLIES										
Bay St. Louis	7,050	7,500	574	642	0	0	0	0	81	86
Hancock County General	-	-	33	33	0	0	0	0	-	-
NASA	-	-	18	20	0	0	0	0	-	-
Waveland	3,300	3,300	240	314	0	0	0	0	73	95
Clermont Harbor	600	500	36	30	0	0	0	0	60	60
Diamondhead Utility	650	1,900	641	530	0	0	0	0	986	279
Seashore Utility	165	170	18	17	0	0	0	0	109	100
Subtotal	11,765	13,370	1,560	1,586	0	0	0	0	-	-
SELF-SUPPLIED INDUSTRY										
NASA-KiIn	-	-	2,125	2,575	0	0	0	0	-	-
RURAL DOMESTIC										
All rural users	6,730	11,167	308	589	57	37	0	0	54	56
TOTAL										
TOTAL	18,495	24,537	3,993	4,750	57	37	0	0	-	-

Table 4.--Summary of water use in Jackson, Harrison, and Hancock Counties, Mississippi, 1975 and 1980

Water Use	Ground Water in 1000 gal/d		Fresh Surface Water in 1000 gal/d		Brackish Surface Water in 1000 gal/d		Total in 1000 gal/d	
	1975	1980	1975	1980	1975	1980	1975	1980
JACKSON COUNTY								
Public Supply	8,905	10,526	0	0	0	0	8,905	10,526
Self-Supplied Industry	10,572	10,122	42,349	56,080	58,486	159,688	111,407	225,890
Rural Domestic	615	1,373	36	25	0	0	651	1,398
Subtotal	20,092	22,021	42,385	56,105	58,486	159,688	120,963	237,814
HARRISON COUNTY								
Public Supply	17,100	19,192	0	0	0	0	17,100	19,192
Self-Supplied Industry	5,719	5,035	0	0	733,000	502,000	738,719	507,035
Rural Domestic	2,571	1,578	60	37	0	0	2,631	1,615
Subtotal	25,390	25,805	60	37	733,000	502,000	758,450	527,842
HANCOCK COUNTY								
Public Supply	1,560	1,586	0	0	0	0	1,560	1,586
Self-Supplied Industry	2,125	2,575	0	0	0	0	2,125	2,575
Rural Domestic	308	589	57	37	0	0	365	626
Subtotal	3,993	4,750	57	37	0	0	4,050	4,787
TOTAL	49,475	52,576	42,502	56,179	791,486	661,688	883,463	770,443

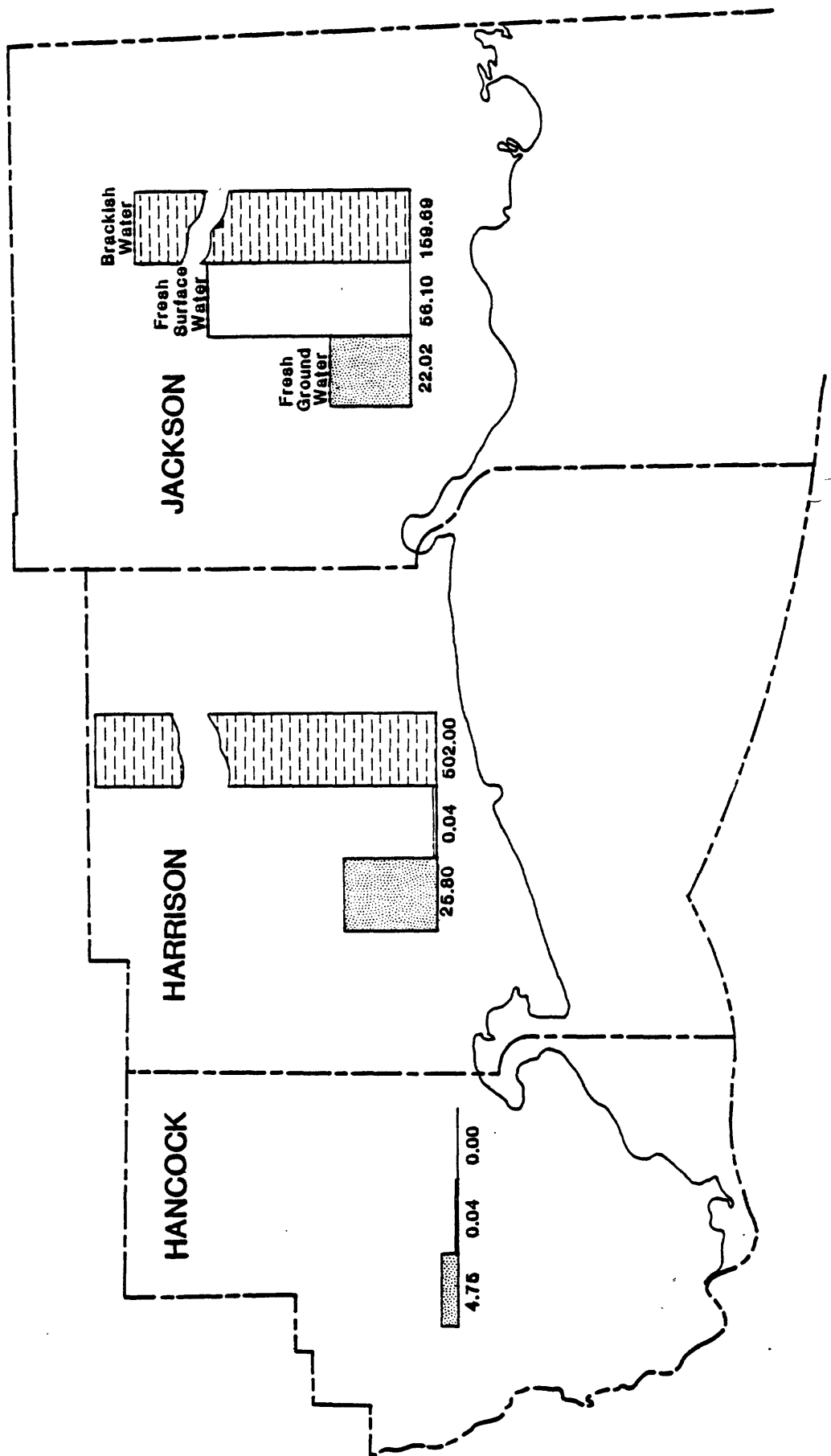


Figure 2.-- Map showing water use in Hancock, Harrison, and Jackson counties, 1980, in million gallons per day.

Harrison County used the largest amount of brackish surface water of the three counties but used very little fresh surface water. Hancock County with a total water use of less than 5 Mgal/d, used very little water in comparison to Harrison and Jackson Counties.

The use of fresh ground water in the three county area increased about 6 percent between 1975 and 1980. The use of fresh surface water also increased during this period due largely to the increased industrial water use in Jackson County. The use of brackish water increased by about 100 Mgal/d in Jackson County between 1975 and 1980 but decreased by 231 Mgal/d in Harrison County.

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