

TECHNICAL MEMORANDUM

A POTABLE WATER USE DATA BASE
FOR SOUTH FLORIDA 1980

L. Carl Woehlcke
Jane Bucca
Donald R. Loving

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE PLANNING DEPARTMENT

May 1983

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
METHODOLOGY	2
Water Use Data	2
Population Estimates	3
THE DATA BASE	5
DIRECTIONS FOR FURTHER STUDY	5

INTRODUCTION

This report presents a water use data base for water utilities and self-supplied residential water users in the area of the South Florida Water Management District (SFWMD) during 1980. While the text of this report describes the methodologies and procedures used in estimating water use and permanent resident population within the District, the tables present the actual estimates. It is hoped that this report will provide insight into the amount of water used as well as patterns in per capita use, persons per connection, maximum to average day pumpages and water losses during treatment. These data should be useful to both the planning and the regulatory departments of the District.

These data were originally collected as part of the ongoing cooperative program between this agency and the U. S. Geological Survey (USGS). The uses covered in that effort included not only public water systems and residential self-supplied uses but also data for irrigation and industrial self-supplied uses. These estimates have not been included in this report because they are not felt to be complete and accurate enough to constitute a definitive data base for those uses.

A series of water use data, covering utility system water use for the years 1978-1981, has been collected by the Water Use Planning Division. However, 1980 was a Census year and presented an opportunity to calibrate water use estimates with population data, and thus to develop reliable estimates of per capita consumption for each utility and for those on individual wells.

The area for which the data were collected corresponds to the jurisdictional boundaries of the South Florida Water Management District and includes all of Dade, Monroe, Collier, Lee, Glades, Hendry, St. Lucie, Martin, Palm Beach, and Broward Counties. Also included are those portions of

available estimate of annual pumpage. In cases involving reverse osmosis (RO) plants, care was taken to include by-pass water as well as raw water entering the plant in estimated total annual pumpage. The only exception to this was the desalination plant at Key West which inputs saline rather than brackish water. In that case, plant output was used. For cases in which water was pumped from surface sources to recharge wellfields, the source was considered to be surface water.

A full year's data were obtained for almost all public water systems. In some cases, data were missing from DER's files or the series was incomplete. The missing information was generally obtained by direct contact with the respective utility. For a few systems, several months of data had to be estimated or the latest available 12 months of data had to be used.

Population Estimates

The estimate of the population served by each utility was developed principally from data from the 1980 Census of Population and from discussions with the utilities. The population concept used in this study is that of permanent resident population, although areas within the District may swell to as much as three times the permanent resident population during the winter months. Census data, which measure permanent resident population, were available for 1980 and whenever possible these figures were employed either as primary data or cross checks on estimated totals. Census data that had been released at the time of the USGS study included only preliminary municipality and county totals. During the study, preliminary final figures were released and adjustments were made accordingly to the estimates used in the study, although the preliminary final figures differed very little from the preliminary estimates.

The Census data were used to estimate the municipal population of utilities which serve one or more municipalities. All utilities were also

THE DATA BASE

The resulting data base is presented in table form at the conclusion of the text. Tables are presented on one page for each county and include a number of variables for each utility: the permanent population served, raw water pumpage in millions of gallons (both the average day and the annual quantity pumped), per capita usage, persons per connection, the ratio of the maximum day to the average day pumpage, and the ratio of total treated to total raw water. The maximum day to the average day ratio gives an indication of the range of demand experienced throughout the year while the ratio of treated to raw water is a measure of the efficiency of the treatment system.

Observations marked by a N/A (not available) symbol were not collected either because the information was not submitted or a utility merger took place during the year making individual utility data unusable. For utilities with more than one treatment plant, no maximum day to average day ratio was obtained because the maximum day would most likely not have fallen on the same day in the several plants and the meaningfulness of the ratio would, therefore, be dubious. These data, of course, are not applicable to the self-supplied/small utility and county total figures.

DIRECTIONS FOR FURTHER STUDY

Now that a data base has been developed, more analytical studies can be undertaken. A wealth of census data will eventually provide cross checks on utility population estimates and self-supplied user population as well as demographic and housing data which can be related to water use.

As more flow reports become available, longer data series can be constructed and changes over time can be evaluated. With more data, attempts at modeling and other detailed analyses become feasible. It is hoped that these continuing data collection efforts will be of great assistance to the

TABLE 1. TOTAL DISTRICT POPULATION BY COUNTY

1970/1980 Census Populations - District Wide

<u>County</u>	<u>1970</u>	<u>1980</u>	<u>% Δ</u>
Broward	620,100	1,014,043	63.5
*Charlotte		276	
Collier	38,040	85,791	125.5
Dade	1,267,792	1,625,979	28.3
Glades	3,669	5,992	63.3
Hendry	11,859	18,599	56.8
*Highlands		4,591	
Lee	105,216	205,266	95.0
Martin	28,035	64,014	128.3
Monroe	52,586	63,098	20.0
*Orange		84,899	
*Osceola		49,077	
*Polk		9,051	
St. Lucie	50,836	87,182	71.5
Palm Beach	348,993	573,125	64.2
*Okeechobee		19,944	
District Population		3,910,927	

All partial counties are not based on census figures.

*These populations represent the portion of the county's population located within the District.

TABLE 3. CHARLOTTE COUNTY

<u>UTILITY NAME</u>	<u>SERVICE AREA PERMANENT POPULATION</u>	<u>UTILITY PUMPAGE IN MILLION GALLONS AVG DAY</u>	<u>DAILY GALLONS PER CAPITA</u>	<u>PERSONS PER CONNECTION</u>	<u>MAXIMUM DAY/ AVERAGE DAY</u>	<u>TOTAL TREATED/ TOTAL RAW</u>
Residential Self- Supplied and Small Utilities*	276	.04	158	N/A	N/A	N/A

*Portion of County included in SFWD.

N/A = Not available

TABLE 5. DADE COUNTY

UTILITY NAME	SERVICE AREA PERMANENT POPULATION	UTILITY PUMPAGE		DAILY GALLONS PER CAPITA	PERSONS PER CONNECTION	MAXIMUM DAY/ AVERAGE DAY	TOTAL TREATED/ TOTAL RAW
		IN MILLION GALLONS AVG DAY	ANNUAL TOTAL				
Dade Utilities	7,000	1.22	446.7	174	4.3	2.26	.92
Florida Cities	6,174	.94	343.4	152	4.5	2.12	N/A
Homestead AFB	12,000	3.12	1140.9	261	N/A	1.78	N/A
Homestead City	20,668	4.96	1816.6	241	3.5	1.77	N/A
Miami-Dade WASA	1,213,599	241.03	88216.3	199	N/A	N/A	.97
North Miami Beach	163,786	25.90	9480.4	158	N/A	N/A	.94
North Miami	42,566	12.39	4535.0	291*	2.3	N/A	.98
So. Miami Shores Water	1,236	.20	73.9	162	2.4	1.35	1.01
Opa Locka	17,460	3.73	1365.0	212	N/A	1.37	.90
Rex Utilities	45,000	8.10	2962.9	180	N/A	N/A	N/A
South Dade Utilities	8,750	1.42	520.5	160	3.8	N/A	N/A
Southern Gulf Utilities**	18,150	2.67	977.0	149	N/A	N/A	.88
Residential Self-Supplied	69,590	11.00	4026.0	158	N/A	N/A	N/A
TOTAL COUNTY	1,625,979	316.67	115,902.8	195			

* 47% of the water consumed is purchased treated from Miami-Dade WASA. The Miami-Dade WASA figure has been adjusted accordingly.

**1/3 of Southern Gulf's distributed water is purchased treated from North Miami Beach. North Miami Beach's figure has been adjusted to reflect this.

N/A = Not available

TABLE 7. HENDRY COUNTY

<u>UTILITY NAME</u>	<u>SERVICE AREA PERMANENT POPULATION</u>	<u>UTILITY PURCHASE IN MILLION GALLONS AVG DAY</u>	<u>UTILITY PURCHASE IN MILLION GALLONS ANNUAL TOTAL</u>	<u>DAILY GALLONS PER CAPITA</u>	<u>PERSONS PER CONNECTION</u>	<u>MAXIMUM DAY/AVERAGE DAY</u>	<u>TOTAL TREATED/TOTAL RAW</u>
Clewiston	10,719	1.62	594.8	151	N/A	N/A	N/A
General Development Utility	300	.07	26.9	233	.96	2.88	.73
La Belle	2,224	.31	112.9	139	- 2.8	5.3	N/A
Residential Self-Supplied and Small Utilities	5,356	.85	309.7	158	N/A	N/A	N/A
COUNTY TOTAL	18,599	2.85	1044.3	153			

N/A = Not available

TABLE 9. LEE COUNTY

UTILITY NAME	SERVICE AREA PERMANENT POPULATION	UTILITY PURCHASE IN MILLION GALLONS AVG DAY	DAILY GALLONS PER CAPITA	PERSONS PER CONNECTION	MAXIMUM DAY/AVERAGE DAY	TOTAL TREATED/TOTAL RAW
Bonita Springs	5,709	.84	147	2.3	1.54	1.01
Cape Coral (RO Treatment) ¹	32,103	6.66	207	2.6	N/A	.61
Island Water (RO Treatment) ²	4,293	1.61	375 *	1.8	N/A	.80
Florida Cities (South)	21,351	3.95	185	1.6	N/A	.99
Florida Cities (Waterway)	7,422	.95	128	2.6	N/A	.93
Ft. Myers	37,989	7.82	206	3.5	1.27	N/A
Greater Pine Island ³ (RO Treatment)	6,294	1.45	230	2.2	N/A	.50
Lee County	42,500	5.20	122	2.5	N/A	N/A
Lehigh Acres	8,477	.84	99	1.5	1.60	.92
San Carlos Utilities	3,125	.37	118	2.4	1.44	.94
Sunland Center	1,000	.12	120	18.9	5.52	.88
Frost International	100	.02	200	N/A	N/A	N/A
Residential Self-Supplied and Small Utilities	34,903	5.51	158	N/A	N/A	N/A
COUNTY TOTAL	205,266	35.36	172			

1 These flows reflect both R.O. and conventional water treatment plants in operation.

2 In 1980, this utility operated an electrolysis and R.O. plant which came on line in April 1980.

3 Total water treatment done by R.O.

N/A = not available

*Believed due to seasonal population

TABLE II. MONROE COUNTY

<u>UTILITY NAME</u>	<u>SERVICE AREA PERMANENT POPULATION</u>	<u>UTILITY PURCHASE IN MILLION GALLONS AVG PER DAY</u>	<u>UTILITY PURCHASE IN MILLION GALLONS ANNUAL TOTAL</u>	<u>DAILY GALLONS PER CAPITA</u>	<u>PERSONS PER CONNECTION</u>	<u>MAXIMUM DAY/ AVERAGE DAY</u>	<u>TOTAL TREATED/ TOTAL RAW</u>
Florida Keys Aqueduct Authority	62,963	8.6	3152.0	137	N/A	N/A	.75
Ocean Reef Club*	135	1.29	471.3	9556**	.2	N/A	N/A
COUNTY TOTAL	63,098	9.90	3623.3	157			

*Reverse Osmosis Plant

n/a = Not available

**Believed due to seasonal population

TABLE 13. ORANGE COUNTY

<u>UTILITY NAME</u>	<u>SERVICE AREA PERMANENT POPULATION</u>	<u>UTILITY PUMPAGE IN MILLION GALLONS AVG DAY</u>	<u>DAILY GALLONS PER CAPITA</u>	<u>PERSONS PER CONNECTION</u>	<u>MAXIMUM DAY/AVERAGE DAY</u>	<u>TOTAL TREATED/TOTAL RAW</u>
Dr. Phillips Utilities	11,000	1.36	496.2	124	N/A	N/A
Orange County Water	7,250	.87	317.7	120	N/A	N/A
Orlando Utilities	40,000	7.94	2907.4	199	N/A	N/A
Residential Self-Supplied and Small Utilities	26,649	4.21	1541.1	158	N/A	N/A
COUNTY TOTAL*	84,899	14.38	5262.4	169		

*Portion of County included in SFMMD

N/A = Not available

TABLE 15. PALM BEACH COUNTY

UTILITY NAME	SERVICE AREA PERMANENT POPULATION	UTILITY PURCHASE IN MILLION GALLONS ANNUAL TOTAL	DAILY GALLONS PER CAPITA	PERSONS PER CONNECTION	MAXIMUM DAY/ AVERAGE DAY	TOTAL TREATED/ TOTAL RAW
Acme Improvement Dist.	3,964	.88	222	1.7	1.79	1.00
Anchorage Mobile Home Park	30	.05	1667*	.3	2.40	N/A
Atlantis Utilities	1,325	.58	438*	1.7	1.62	N/A
Belle Glade, City of	16,535	4.48	271	3.4	1.42	.92
Boca Raton, City of	58,490	23.95	409*	N/A	1.46	.95
Boynton Beach, City of	43,000	7.89	183	3.2	1.44	1.04
Century Village	10,623	1.02	96	1.3	1.34	.93
Consolidated Utilities	2,200	.18	82	3.5	1.67	.98
Delray Beach	34,334	12.93	377*	3.0	1.31	.88
Golf, Village of	1,294	.28	216	N/A	1.93	N/A
Highland Beach	2,030	.84	414*	6.5	1.61	.93
Jamaica Bay Mobile Home Park	450	.07	156	N/A	2.14	.98
Juno Beach	1,142	.30	263	N/A	N/A	.92
Jupiter, City of	19,600	3.36	171	5.1	1.62	.89
Lake Worth Utility	27,318	6.38	234	2.4	1.51	.89
Lantana	3,048	1.76	219	3.0	1.58	.97
Manalapan	491	.74	1507*	2.0	1.64	N/A
Mangonia Park	1,189	.42	353	N/A	1.98	N/A
Meadowbrook Utilities (1st Fla)	4,000	.56	140	2.9	1.87	.91
National Mobile Home Industries (Lake Worth Village)	952	.21	221	N/A	2.57	.96
Northern Pines Mobile Home Park	218	.06	275	.75	N/A	N/A
Pahokee	8,746	.79	90	5.0	1.34	.95
Palm Beach Co. System 1	29,603	2.42	132	4.1	1.50	.97
Palm Beach Co. System 2	18,368	2.15	117	N/A	N/A	1.03
Palm Beach Co. System 3	27,245	1.66	61	2.8	1.66	.97
Palm Beach Co. System 5	2,190	.18	82	N/A	N/A	.99
Palm Springs	14,300	2.88	201	2.7	1.59	1.06
Pheasant Run	1,125	.19	169	2.5	2.26	N/A
Riviera Beach	27,463	6.45	235	3.44	1.40	.98
Royal Palm Beach	3,958	.69	174	N/A	N/A	.89
Sand & Sea Mobile Home Park	946	.11	116	N/A	N/A	N/A
Seacoast Utilities	47,818	12.06	252	N/A	N/A	.95
South Bay	4,491	.50	111	N/A	1.52	.93
South Palm Beach	20,000	3.15	158	N/A	1.71	.93
U. S. Sugar Corporation	300	.34	1133**	N/A	N/A	N/A
West Palm Beach, City of	74,108	23.28	314	3.3	1.37	.95
Residential Self-Supplied and Small Utilities	55,231	8.73	158	N/A	N/A	N/A
COUNTY TOTAL	573,125	132.63	48,507.7			

N/A = Not available
*Due to seasonal population
**Due to seasonal fruit processing

TABLE 17. ST. LUCIE COUNTY

UTILITY NAME	SERVICE AREA PERMANENT POPULATION	UTILITY PUMPAGE IN MILLION GALLONS		DAILY GALLONS PER CAPITA	PERSONS PER CONNECTION	MAXIMUM DAY/ AVERAGE DAY	TOTAL TREATED/ TOTAL RAW
		AVG DAY	ANNUAL TOTAL				
Bryn Mawr Camp Resort	N/A	.05	17.3	N/A	N/A	N/A	N/A
Ft. Pierce, City of	37,010	7.55	2763.4	204	3.2	1.3	.92
General Deve lopment	15,800	1.84	672.7	116	2.3	1.5	.87
Spanish Lakes Mobile Home Park	2,700	.25	89.7	93	N/A	2.2	N/A
Residential Self-Supplied and Small Utilities	31,672	5.00	1831.5	158	N/A	N/A	N/A
COUNTY TOTAL	87,182	14.68	5,374.6	168			

N/A = Not available