

PROJECTED PUBLIC SUPPLY AND RURAL (SELF-SUPPLIED) WATER USE IN FLORIDA THROUGH YEAR 2020By
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1984**INTRODUCTION**

The population of Florida increased from 2.8 million in 1950 to more than 9.7 million in 1980. This growth is expected to continue and to almost double to 18.8 million by the year 2020. The amount of freshwater available for man's use from year to year will remain relatively unchanged as the population increases; therefore, it is important to estimate future water needs. The amount of freshwater used in 1980 for public supplies and rural domestic and livestock use was 1,672 million gallons per day (Mgal/d). This amount to 23 percent of the 7,309 Mgal/d total freshwater used in the State. The other reported uses were: self-supplied industry, 11 percent; irrigation, 41 percent; and thermoelectric power production, 25 percent.

This report portrays Florida's past, present, and future freshwater requirements for public supplies and for rural domestic and livestock self-supplied use. The combined freshwater use by public supplies and rural domestic and livestock use increased from 225 Mgal/d in 1950 to 1,672 Mgal/d in 1980. In addition to the stress on the overall freshwater supply resulting from population growth, average per capita use for public supplies and rural use increased from 81 gallons per day (gal/d) in 1950 to 172 gal/d by 1980 (fig. 1). The increase in per capita use has resulted from increased use for lawn watering, washing machines, air conditioning, garbage disposals, and other residential uses. This increase in per capita use has been leveling off and is expected to increase only slightly in the future. The national per capita use (172 gal/d in 1980) has also been leveling off with similar trends as Florida and is also expected to increase only slightly in the future.

The projection of water use in Florida for this report was estimated for each county from the 1980 per capita use and trends in water use for each county and from the University of Florida publication "Projections of Florida population by county, 1985-2020." Water use trends for each county are expected to remain about the same through the year 2020. As trends in future water use are based upon past use, these projections may vary in accuracy among the counties, but should provide a reasonably accurate overall projection of future total freshwater use for the populace in the State. These projections do not take into account inflation or other economic factors that may affect the future amounts of freshwater used.

In 1980, average daily per capita water use ranged widely by counties in Florida. The extremes in per capita use ranged from 438 and 421 gal/d for Okeechobee and Bay Counties to 60 gal/d for Monroe County. The high per capita use in Okeechobee County was the result of low population relative to the number of livestock. Bay County's high per capita use was because 75 percent of its public supply was used for industrial and commercial uses. In contrast, the low per capita use in Monroe County resulted from a combination of (1) little or no industrial and livestock use, (2) limited freshwater resources, and (3) the high cost of public water that is supplied from desalination plants or imported from Dade County.

It is projected that during the next 40 years the freshwater used for public supplies and rural domestic and livestock will almost double the amount used in 1980.

POPULATION

State and county population projections used in this report for the years 2000 and 2020 are from the University of Florida publication "Projections of Florida population by county, 1985-2020." These population projections show a low, median, and high value for each year. For purposes of this report, median population estimates by county were used. Table 1 shows the 1980 population by counties and the projections for the years 2000 and 2020. The projection to the year 2020 shows a 93 percent growth or about double the 1980 population. Twenty-nine counties have a projected population increase of more than 100 percent and five counties show a projected population increase of less than 50 percent. The projected population for each county was used in estimating the future water use by public supplies and for rural use.

PUBLIC SUPPLY

A municipal water supply or a water utility company that serves the public or sells water to the public is classed as a "public supply." Public supply includes not only water for domestic use but for irrigating lawns and gardens, agriculture, industry, commerce, and air conditioning. In Florida, public supply increased from 170 gal/d in 1950 to 1,361 Mgal/d in 1980. Future requirements are estimated to be 2,046 and 2,599 Mgal/d for the years 2000 and 2020, respectively. The amount for 2020 is more than 15 times that used in 1950 and twice that used in 1980. The percent of predicted increase, in general, for counties in the panhandle of Florida is either near or below the statewide average and the predicted increase for counties in the rest of the State is either equal to or above the average. Notable exceptions were the more populated counties of Dade, Duval, Hillsborough, Orange, and Pinellas which had a percentage increase below the State average even though they had the largest increases in total water withdrawn.

RURAL

If public supply is not available to individual families, or if available but another source is used, the water used is considered self-supplied and categorized in this report as "rural" or "rural supply" whether or not the users live within the city limits. As used in this report, rural supply includes both domestic and livestock water use from individual wells or points of surface-water diversion. Rural domestic use was computed by multiplying the number of people in each county not served by public supply systems by the per capita use amount that was estimated from areas where records were kept on post water inventories. Water for livestock was estimated on the basis of a fixed amount of water used per head for each kind of animal, for example, 15 gal/d for cattle and 0.04 gal/d for chickens. As water for livestock use accounted for less than 4 percent of the total domestic use in 1980, projected livestock water use for 2000 and 2020 is not considered to be much of a factor. The projected use for livestock was estimated from post livestock water-use records, trends prior to 1980, and from the 1980 amount.

Self-supplied rural water use increased from 55 Mgal/d in 1950 to 310 Mgal/d in 1980. Predicted requirements of 498 and 636 Mgal/d are estimated for the years 2000 and 2020. The amount for 2020 is nearly 11 times the 55 Mgal/d used in 1950 and nearly double that for 1980.

Just as per capita use of public supply has increased, so has rural domestic per capita use increased over the years. Per capita use increased from 142 gal/d in 1970 and 1975 to 148 gal/d in 1977 and to 159 gal/d in 1980.

TOTAL PUBLIC SUPPLY AND RURAL (SELF-SUPPLIED) WATER USE THROUGH YEAR 2020

Projected public supply and rural water use have been combined to determine the projected total domestic water requirements for estimated populations for the years 2000 and 2020. The large map shows the estimated total water requirements for public supply and rural self-supplied for the year 2020. The large map also shows the percentages of increase in water use from 1980 to 2020.

The reported and estimated total domestic water use by counties for 1980, 2000, and 2020 is given in table 2. The total in 1980 was 1,672 Mgal/d, whereas in 1950, it was 225 Mgal/d. The total estimated domestic water use for 2000 and 2020 is 2,544 and 3,235 Mgal/d, respectively. The amount in 2020 represents an increase of about 3,000 Mgal/d since 1950 and about 1,600 Mgal/d since 1980. The domestic water use reported by counties in 1980 is shown in figure 2, and that projected for 2000 and 2020 is shown in figure 3 and the large map, respectively.

The statewide population from 1950 through 1980 and the estimated population through the year 2020 is shown in figure 4. Also shown is the reported water use for public supplies, rural self-supplied, and their totals for 1950 through 1980 with their estimated amounts to the year 2020. In the future, if the upward trends continue, there will be an ever increasing stress on Florida's available water resources that will require wise water management practices to insure that maximum benefits will be obtained from use of these resources.

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Table 1.—Florida 1980 population by counties, in thousands, and projections for year 2000 and 2020. (from University of Florida, 1983).

COUNTY	1980	2000	2020
ALACHUA	151.3	221.2	280.8
BAKER	15.3	22.9	29.0
BAY	97.7	144.3	183.1
BRADFORD	20.0	28.8	36.6
BREVARD	273.0	431.3	547.4
BROWARD	1,014.0	1,564.0	1,985.0
CALHOUN	9.3	11.3	14.3
CHARLOTTE	59.1	124.0	157.4
CITRUS	54.7	124.0	157.4
CLAY	57.1	124.1	157.5
COLLIER	85.8	183.5	232.9
COLUMBIA	35.4	52.3	66.4
DADE	1,626.0	2,126.0	2,698.3
DE SOTO	19.0	28.2	35.8
DIXIE	7.8	13.9	17.7
DUVAL	571.0	632.1	802.2
ESCAMBIA	233.8	309.4	381.3
FLAGLER	10.9	26.3	33.3
FRANKLIN	6.9	8.7	11.1
GADSDEN	41.6	51.9	65.9
GILCHRIST	5.8	12.5	15.9
GLADES	6.0	8.8	11.2
GULF	10.7	11.3	14.3
HAMILTON	8.8	9.2	11.6
HARDEE	19.4	24.6	31.2
HENDRY	18.6	31.5	40.0
HERNANDO	44.5	107.1	135.9
HIGHLANDS	47.5	81.4	103.3
HILLSBOROUGH	647.0	915.6	1,162.1
HOLMES	14.7	20.6	26.1
INDIAN RIVER	59.9	115.2	146.3
JACKSON	39.2	45.4	57.6
JEFFERSON	10.7	13.9	17.6
LAFAYETTE	4.0	5.8	7.3
LAKE	104.9	188.1	233.4
LEE	205.3	406.0	508.5
LEON	148.7	229.5	291.3
LEVY	19.9	32.5	41.3
LIBERTY	0.1	0.5	0.8
MADISON	14.9	16.4	20.8
MANATEE	148.4	237.1	300.9
MARION	122.5	232.1	294.6
MARTIN	64.0	130.1	165.2
MONROE	63.1	76.9	97.7
NASSAU	32.9	52.3	66.3
OKALOOSA	109.9	157.1	199.4
OREGON	20.3	35.1	44.5
ORANGE	471.7	676.7	858.8
OSCEOLA	49.3	112.5	142.8
PALM BEACH	573.1	1,051.0	1,333.9
PASCO	194.1	391.3	496.6
PINELLAS	728.4	998.8	1,267.7
POLK	321.7	475.7	603.8
PUTNAM	26.5	41.2	50.7
ST. JOHNS	51.3	97.8	124.1
ST. LUCIE	87.2	175.9	223.2
SANTA ROSA	56.0	81.2	103.6
SARASOTA	202.3	342.1	434.2
SEMINOLE	197.8	343.7	436.2
SUMTER	24.3	38.6	49.0
SUWANNEE	22.3	34.9	44.3
TAYLOR	16.5	25.4	28.5
UNION	10.2	13.9	17.7
VOLUSIA	258.8	415.2	542.6
WAKULLA	19.2	30.9	40.2
WALTON	21.3	31.8	40.4
WASHINGTON	14.5	19.4	24.7
TOTALS	9,740.6	14,820.7	18,510.5

Table 2.—Reported and projected water use by counties, in million gallons per day.

COUNTY	PUBLIC SUPPLIES			RURAL (self-supplied)			TOTAL WATER USE		
	1980	2000	2020	1980	2000	2020	1980	2000	2020
ALACHUA	18.18	26.58	33.81	8.52	12.46	15.85	26.70	39.04	49.66
BAKER	0.60	0.90	1.14	2.56	3.83	4.86	3.16	4.73	6.00
BAY	39.50	58.34	73.78	1.59	2.35	2.97	41.09	60.69	76.75
BRADFORD	1.05	1.51	1.92	2.91	4.19	5.33	3.96	5.70	7.25
BREVARD	28.77	44.66	57.83	4.70	7.43	9.45	33.47	52.09	67.28
BROWARD	184.19	284.60	361.60	6.33	9.78	12.41	190.72	294.69	373.81
CALHOUN	0.33	0.40	0.51	0.75	0.91	1.16	1.08	1.31	1.67
CHARLOTTE	4.93	10.34	13.11	1.24	2.60	3.30	6.17	12.94	16.41
CITRUS	0.91	2.06	2.62	5.84	13.24	16.82	6.75	15.30	19.44
CLAY	1.83	3.38	4.30	9.94	18.38	23.36	11.77	21.76	27.66
COLLIER	19.30	41.21	52.30	2.56	5.53	6.94	21.86	46.74	59.24
COLUMBIA	2.01	2.97	3.78	4.81	7.11	9.04	6.82	10.08	12.82
DADE	306.46	400.70	508.72	18.55	24.25	30.79	325.01	424.95	539.51
DE SOTO	0.71	1.05	1.33	2.15	3.19	4.04	2.86	4.24	5.37
DIXIE	0.55	0.98	1.25	0.51	0.91	1.16	1.06	1.89	2.41
DUVAL	59.56	65.93	83.38	21.65	23.97	30.31	81.21	89.90	113.69
ESCAMBIA	30.46	41.13	53.33	6.76	10.33	13.11	37.22	51.46	66.44
FLAGLER	0.77	1.86	2.36	0.56	1.35	1.71	1.33	3.21	4.07
FRANKLIN	1.00	1.13	1.44	0.29	0.33	0.42	1.29	1.46	1.86
GADSDEN	2.24	2.79	3.54	3.12	3.89	4.93	5.36	6.68	8.47
GILCHRIST	0.36	0.78	0.99	1.08	2.33	2.96	1.44	3.11	3.95
GLADES	0.21	0.31	0.39	1.28	1.88	2.39	1.49	2.19	2.78
GULF	0.97	1.02	1.33	0.57	0.60	0.76	1.54	1.62	2.09
HAMILTON	0.68	0.71	0.80	0.54	1.06	1.48	1.55	2.06	
HARDEE	1.27	1.61	2.04	2.58	3.27	4.15	3.85	6.18	6.18
HENDRY	2.00	3.39	4.30	2.50	4.23	5.38	4.50	7.62	9.68
HERNANDO	8.14	27.4	34.8	4.92	11.84	15.01	6.06	14.58	18.49
HIGHLANDS	4.96	8.48	10.74	6.30	10.80	13.67	11.26	19.28	24.41
HILLSBOROUGH	84.70	119.86	162.46	10.22	14.46	18.40	94.92	134.32	170.86
HOLMES	0.64	0.89	1.14	1.84	2.58	3.28	2.48	3.47	4.42
INDIAN RIVER	6.21	11.94	15.15	4.47	8.60	10.91	10.68	20.54	26.06
JACKSON	2.15	2.49	3.16	3.08	3.57	4.53	5.23	6.06	7.69
JEFFERSON	0.49	0.64	0.80	1.28	1.66	2.10	1.77	2.30	2.90
LAFAYETTE	0.12	0.18	0.22	1.38	2.00	2.53	1.50	2.18	2.75
LAKE	11.39	18.25	23.12	6.46	10.35	13.11	17.85	28.60	36.23
LEE	29.84	58.23	74.00	6.31	12.31	15.65	36.15	70.84	89.65
LEON	17.20	26.55	33.71	3.61	5.57	7.08	20.81	32.12	40.79
LEVY	1.10	1.80	2.29	2.20	3.59	4.58	3.30	5.39	6.87
LIBERTY	0.13	0.15	0.21	0.30	0.37	0.47	0.43	0.53	0.68
MADISON	0.96	1.06	1.34	1.53	1.68	2.14	2.49	2.74	3.48
MANATEE	20.86	33.33	42.35	5.38	7.89	10.92	26.24	41.22	53.27
MARION	6.78	12.85	16.27	9.11	17.29	21.86	15.89	30.14	38.13
MARTIN	6.15	12.50	15.87	6.38	11.50	14.46	12.53	24.00	32.33
MONROE	3.76	4.58	5.83	0.00	0.00	0.00	3.76	4.58	5.83
NASSAU	2.77	4.40	5.60	7.12	10.39	14.38	9.89	14.79	19.98
OKALOOSA	12.94	18.50	23.42	3.97	5.68	7.19	16.91	24.18	30.61
OREGON	1.55	2.68	3.39	2.30	3.27	4.15	3.85	5.95	7.54
ORANGE	69.41	99.58	126.33	15.34	22.01	27.92	84.75	121.59	154.25
OSCEOLA	4.19	9.56	12.15	5.52	12.60	16.01	9.71	22.16	28.16
PALM BEACH	123.81	227.05	288.46	11.82	21.68	27.54	135.63	248.73	316.02
PASCO	11.92	24.03	30.52	7.71	15.04	19.74	19.63	39.07	50.26
PINELLAS	102.85	141.03	178.96	3.39	4.65	5.90	106.24	145.68	184.86
POLK	35.54	52.55	66.82	16.00	23.66	30.08	51.54	76.21	96.90
PUTNAM	2.86	5.15	6.30	7.51	9.51	11.56	10.36	14.66	18.86
ST. JOHNS	2.98	5.55	7.04	4.91	9.36	11.88	7.89	14.91	18.92
ST. LUCIE	9.69	19.55	24.81	3.92	7.91	10.04	13.61	27.46	34.80
SANTA ROSA	5.83	8.45	10.73	6.88	11.82	14.62	6.71	9.73	12.35
SEMINOLE	13.98	26.72	33.97	13.13	25.10	31.91	27.11	55.43	65.33
SUMTER	1.02	1.66	2.06	2.57	4.08	5.19	3.59	5.70	7.25
TAYLOR	1.06	1.66	2.11	2.74	4.29	5.45	3.80	5.95	7.56
WALTON	4.99	2.02	2.48	2.88	1.09	1.48	2.18	1.18	1.62
UNION	0.57	0.78	0.99	0.61	0.83	1.06	1.18	1.61	2.05
VOLUSIA	26.57	48.39	58.80	6.25	10.32	13.13	32.82	54.21	66.93
WAGNER	0.42	0.82	1.04	0.74	0.99	1.21	1.31	1.91	2.41
WALTON	1.62	2.42	3.00	1.01	1.51	1.92	2.63	3.93	5.00
WASHINGTON	0.92	1.23	1.56	1.03	1.38	1.75	1.95	2.61	3.31