

St. Johns County Utility Dept. Conservation Rates: Increasing Block

St. Johns County Utility Department (SJCUD) provides retail water and wastewater services to St. Johns County located in northeastern Florida along the Atlantic coast. SJCUD serves a population of approximately 55,000. As of the 2000 Census, the median household income in St. Johns County was \$50,099, which is higher than the statewide median of \$38,819.¹

UTILITY DEMOGRAPHICS

SJCUD's service area is 72.3 square miles. As of August 2005, SJCUD had 20,156 connections, 95% of which were residential. Of their total connections, 19,068 were single family residential, 149 were multifamily residential, 863 were commercial, 5 were industrial, 43 were governmental, and 28 were mixed use connections. The average single family residential water use is approximately 145 gallons per capita per day (gpcd), as of 2004.

INCREASING BLOCK RATE

Affected Participants:
Participants Analyzed:
Effective Date:

Whole Utility
Single Family,
Multi-family, Commercial, Governmental
April 1, 2001

UTILITY RATE STRUCTURE AND PRICES

On April 1, 2001, SJCUD adopted an increasing block rate structure. Since 2001, the individual prices per block have increased. As of July 2005, participants are charged a monthly service fee of \$9.81 for 5/8" x 3/4" meters in addition to a variable charge:

CURRENT CAPACITY AND WATER SOURCES

SJCUD's primary source of water is from Floridan and surficial wells. SJCUD has a storage capacity of 7.5 million gallons.

FUTURE PLANS TO MEET DEMAND

The population of SJCUD's service area is growing at a rate of 9% per year. SJCUD plans to meet future demands by adding capacity and converting to a reverse osmosis treatment plant.

RATE STRUCTURE - PROGRAM DESCRIPTION

SJCUD adopted an increasing block rate structure on April 1, 2001. Prior to the change, all participants were subject to a base charge that included up to 4,000 gallons and an additional charge per 1,000 gallons thereafter. Just before the rate change, the price was \$5.26 per 1,000 gallons above 4,000 gallons per month.

As of the April 2001 rate change, the new rate structure included a monthly base rate and four usage categories:

¹ US Census Bureau. FactFinder.

Usage	Price
0-4,000 gallons	\$2.92 per 1,000 gallons
4,001-8,000 gallons	\$3.94 per 1,000 gallons
8,001-15,000 gallons	\$5.32 per 1,000 gallons
15,001 gallons and over	\$7.18 per 1,000 gallons

Water rates have increased on October 1st of each year since 2001 and on July 1st in 2005. In 2005, the usage categories changed slightly, so that current prices are as follows:

Usage	Price
0-5,000 gallons	\$2.49 per 1,000 gallons
5,001-10,000 gallons	\$3.11 per 1,000 gallons
10,001-20,000 gallons	\$5.24 per 1,000 gallons
20,001 gallons and over	\$7.60 per 1,000 gallons

METHODOLOGY

Please see the General Methodology for the specific procedures and techniques used for all ECoBA analyses.

The methodology for this analysis is different from most of the cases in the study because no control group was available for comparison. This is because the rate structure change affected all participants. Instead

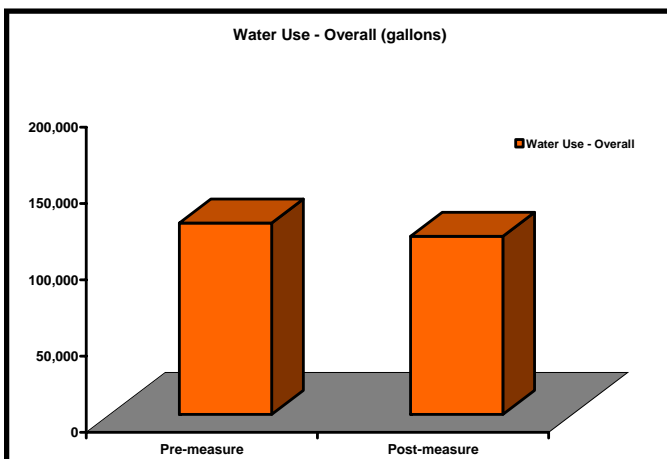
OTHER ST JOHNS CONSERVATION PROGRAMS

St. Johns County Utility Department had no other conservation measures in place during the period of this conservation ordinance analysis.

of using a control group, the water savings were calculated solely from the difference in pre- and post-measure water use. The pre-measure and post-measure time periods were two years each, April 1999 through March 2001 and April 2001 through March 2003. The average yearly water savings

from the two years after the rate change was extrapolated for twenty years, the assumed lifespan of the rate change.

All quantified costs and benefits have been discounted to the first year of the analysis (2001) and inflated to 2004 dollars. The discount rate used in this analysis was 5.35%. The CPI values that were used in this analysis were the 2004 value of 188.9 and the 2001 value of 177.1.



It was not possible to follow the individual participants that were present at the time of implementation of the rate change. Instead, the number of connections was used as a proxy. The number of connections varied by month. There was an average of 10,351 single family residential connections, 98 multifamily connections, 480 commercial connections, and 40 governmental connections, for an average of 10,969 connections total

for the period of analysis. The average number of connections over the twenty year lifespan of the rate change was 18,804, which is the value used in the cost-benefit calculations.

ASSUMPTIONS

Please see the General Assumptions for the specific conditions and rules underlying all ECoBA analyses.

In calculating the average number of connections over the twenty year period of analysis, it was assumed that the annual growth in connections was equal to the average annual growth between April 1999 and March 2003.

The price of water used in calculating the benefits from water savings were averages of "block 3" rates from the period from April 2001 to October 2004.

Accounts that had zero usage during the course of the year were eliminated from the total connections for that year.

The discount rate used in this analysis was 5.35%.

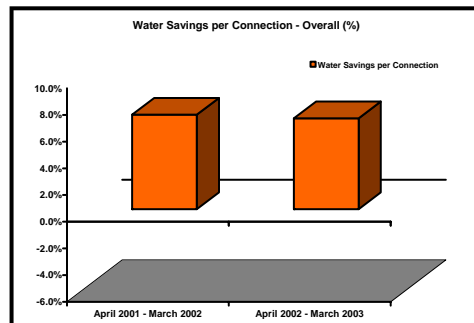
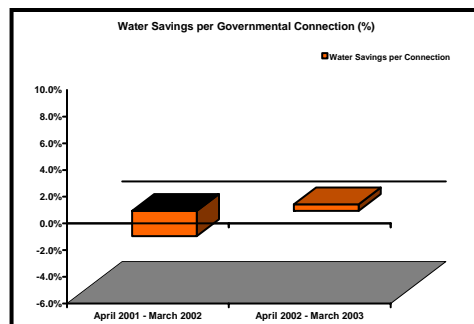
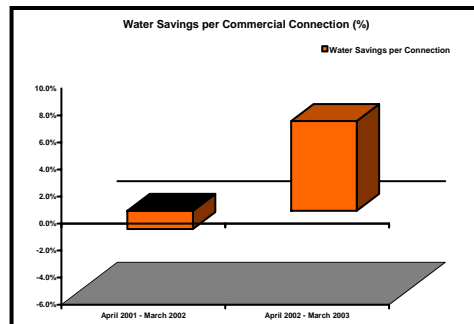
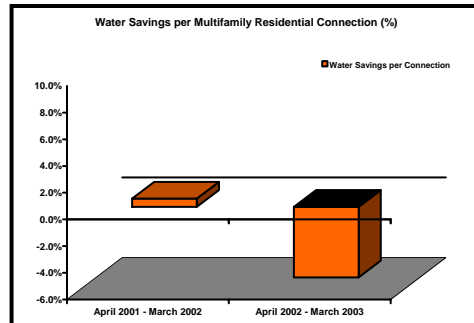
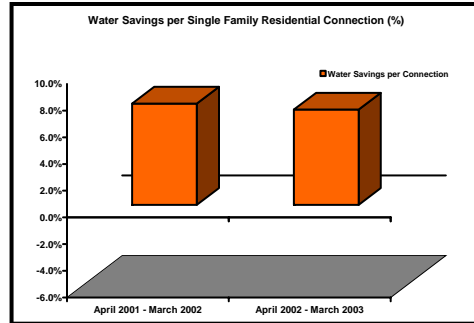
The CPI values that were used in this analysis were the 2004 value of 188.9 and the 2001 value of 177.1.

The calculation of water savings and any benefits derived from water savings started the date of the rate structure change, April 1, 2001.

RESULTS - WATER SAVINGS

For single family residential connections, during the first year after the rate change, the water savings amounted to 100,975,570 gallons, or 9,755 gallons per participant per year (gppy) (7.6% of pre-measure water use). The second year after, water savings amounted to 95,040,259 gallons, or 9,182 gppy (7.1% of pre-measure water use). The average savings per year was 98,007,915 gallons (300.8 AF), or 9,468 gppy (7.4% of pre-measure water use). The total water savings over the twenty year assumed lifespan of the rates was 1,960,158,294 gallons (6,015.5 AF), or 107,992 gallons per participant.

For multifamily residential connections, during the first year after the rate change, the water savings amounted to 39,715 gallons, or 407 gallons per participant per year (gppy) (0.6% of pre-measure water use). The second year after, no water savings occurred. There was an increase in water use of 341,619 gallons, or 3,504 gppy (5.3% of pre-measure water use). On average, no water savings occurred; water use increased by 150,952 gallons (0.5 AF), or 1,548 gppy (2.3% of pre-measure water use). Over



the twenty year assumed lifespan of the rates there were no water savings; water use increased by 3,019,043 gallons (9.3AF), or 25,694 gallons per participant.

For commercial connections, during the first year after the rate change, no water savings occurred. There was an increase in water use of 495,996 gallons, or 1,034 gallons per participant per year (gppy) (1.4% of pre-measure water use). The second year after, water savings amounted to 2,441,536 gallons, or 5,089 gppy (6.7% of pre-measure water use). The average savings per year was 972,770 gallons (3.0 AF), or 2,028 gppy (2.7% of pre-measure water use). **The total water savings over the twenty year assumed lifespan of the rates was 19,455,404 gallons (59.7 AF), or 32,211 gallons per participant.**

For governmental connections, during the first year after the rate change, no water savings occurred. There was an increase in water use of 46,428 gallons, or 1,161 gallons per participant per year (gppy) (1.9% of pre-measure water use). The second year after, water savings amounted to 12,134 gallons, or 303 gppy (0.5% of pre-measure water use). On average, no savings occurred; water use increased by 17,147 gallons (0.1 AF), or 429 gppy (0.7% of pre-measure water use). **No water savings occurred over the twenty year assumed lifespan of the rates; water use increased by 342,936 gallons (1.1 AF), or 6,659 gallons per participant.**

For all connections analyzed, during the first year after the rate change, the water savings amounted to 97,396,518 gallons, or 8,880 gallons per participant per year (gppy) (7.1% of pre-measure water use). The second year after, water savings amounted to 93,704,669 gallons, or 8,543 gppy (6.8% of pre-measure water use). The average savings per year was 95,550,593 gallons (293.2 AF), or 8,711 gppy (6.9% of pre-measure water use). **The total water savings over the twenty year assumed lifespan of the rates was 1,911,011,870 gallons (5,864.7 AF), or 10,163 gallons per participant.**

RESULTS - COST BENEFIT ANALYSIS

Costs and benefits listed below represent the entire lifespan of the program (twenty years).

Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Planning & Research	\$37,332	Not Quantified	Not Quantified	Water Bill Savings	\$6,842,739
Total	\$37,332			Total	\$6,842,739

- ◆ The quantified cost to the utility was \$37,332 (\$2 per connection), which includes the costs of planning and research.
- ◆ The quantified benefit to the utility was \$0.
- ◆ The quantified cost to the participants was \$0.
- ◆ The quantified benefit to participants was \$6,842,739 (\$364 per connection), which includes the benefit of water bill savings.

UTILITY PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of -\$37,332 from the utility perspective. This is a net benefit of -\$2 per participant. The quantified costs to the utility were greater than the quantified benefits to the utility. **The cost per acre-foot of water saved from the utility perspective was \$6.**

PARTICIPANT PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of \$6,842,739 from the participants perspective. This is a net benefit of \$364 per participant. The quantified costs to the participants were less than the quantified benefits to the participants. **The cost per acre-foot of water saved from the participant perspective was \$0.**

OVERALL PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of \$6,805,407 from an overall perspective. This is a net benefit of \$362 per participant. The quantified costs to the participants and utility were greater than the quantified benefits to the participants and utility. **The cost per acre-foot of water saved from an overall perspective was \$6.**

UNQUANTIFIED COSTS AND BENEFITS

Costs

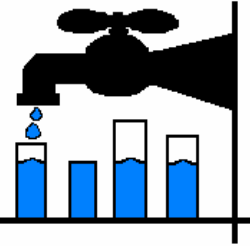
- Cost of instituting rate structure.

Benefits

- Financial savings on sewer bills for participants.
- Avoided cost of acquisition and distribution of water saved.
- Environmental benefits of reduced use of water.
- Increased public awareness about water conservation.
- Reinforces need to conserve water and desirability of conserving.
- Delays capital improvement projects.
- Water saved for future municipal use.

St. Johns County Utility Department

Conservation Rates: Increasing Block



Results of Cost Benefit Analysis-Lifespan (20 Years)

	UTILITY	PARTICIPANT	OVERALL
<u>Present Value Costs</u>			
Costs to Utility	37,332	NA	37,332
Costs to Participants	NA	0	0
Costs to Others	NA	NA	0
Total Costs	\$37,332	\$0	\$37,332
<u>Present Value Benefits</u>			
Total Water Savings	5,864.67 AF	5,864.67 AF	5,864.67 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	6,842,739	6,842,739
Benefits to Others	NA	NA	0
Total Benefits	\$0	\$6,842,739	\$6,842,739
<u>Cost Benefit Calculations</u>			
Net Present Value (NPV) (Total Benefits - Total Costs)	-\$37,332	\$6,842,739	\$6,805,407
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	\$6 /AF	\$0 /AF	\$6 /AF