

IMPACT OF THE NEW WATER PRICING STRUCTURE
AMONG VARYING RESIDENTIAL ECONOMIC SECTORS IN
SARATOGA SPRINGS

By

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ABSTRACT

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The City of Saratoga Springs, located in the water-rich northern United States, is outgrowing its current municipal water source. In an attempt to promote water conservation, the city has recently replaced their long-standing residential flat-rate water pricing structure with a structure based on use. The purpose of this study was to assess the impact of Saratoga Springs' new water pricing structure on water use and perceptions of water for residences of varying annual household income. Using Geographic Information Systems Parcel Data from 2005, Saratoga Springs residents from various household income brackets were randomly selected to participate in a survey quantifying individual water bill and water use changes. The results of this survey suggest that while all economic groups are experiencing changes in their water bills with the new fee structure, most have not changed their water use habits in any significant manner. The new pricing structure appears to be ineffective in its attempt to further water conservation and/or foster a sense of empowerment within the lowest water consumers.

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Introduction

Water scarcity is a very real concern on the global level. Estimates of water scarcity indicate that 41% of the world's population, or 2.3 billion people, live in river basins characterized by "water stress" or frequent water shortages (WRI 2005). A full 1.7 billion of these people live in "highly stressed" water basins where problems of local food production and economic development are severe (WRI 2005). Rapidly increasing water consumption practices are considered to be largely responsible for this growing scarcity. Between 1990 and 1995 global water consumption increased six-fold (WRI 2005). This rate continues to increase with the growth of agricultural, industrial, and domestic practices.

According to Carmen Revenga, senior associate of the WRI, "better management of water resources is the key to mitigating water scarcities in the future and avoiding further damage to aquatic ecosystems" (WRI 2005). The results of her research indicate that a more efficient use of water may drastically expand the viability of the limited resources available (WRI 2005). According to Peter Gleick, co-founder and President of the Pacific Institute for Studies in Development, Environment, and Security, the potential impact of conservation is large enough that even with population growth it could delay or perhaps eliminate the need for new water sources (Gleick, at. al. 2005).

The most efficient water conservation measures are those that address the least efficient water practices. The Pacific Institute determined that residential water use account for 54% of the total water used in urban areas (Gleick, at. al. 2005). This

percentage is even larger in suburban and rural areas. Because residential use accounts for a large percentage of total water use in most cities, policies aimed directly at reducing water consumption among their residential users provide many opportunities for water conservation. Water rate structures are an important tool policymakers use to encourage efficient water use. Studies conducted by the Western Resources Advocates (WRA 2004) indicate that cities with water rate structures “accurately reflecting the value of water and the costs of obtaining new water supplies” have lower per capita water use and are able to maximize the longevity of existing water supplies. Well-designed rate structures encourage water conservation while simultaneously maintaining affordable prices for the modest consumer (WRA 2004).

Water rate structures vary considerably but generally fall into one of four categories: decreasing block rates, uniform rates, increasing block rates and seasonal rates (WRA 2004). Under a decreasing block rate structure, the price per unit decreases as water consumption increases. Conversely, increasing block rate structures charge customers more per unit as consumption increases. A uniform rate structure charges every customer the same rate regardless of the number of units consumed. Seasonal rates generally relay a higher cost onto the consumer in the summer than in the winter (WRA 2004). Seasonal rates may use any of the other rate structures in conjunction with the seasonal variation. Most of these pricing structures include both a service charge and a consumption charge (WRA 2004). A service charge, when implemented, applies to all customers and does not fluctuate according to consumption rate. This fixed service fee is generally distributed on either a monthly or annual basis (WRA 2004). A consumption

charge is simply the amount an individual ends up paying (regardless of the structure used) for each unit of water consumed.

Saratoga Springs is nationally recognized as a center of tourism due in large part to the presence of horse racing, the New York Ballet, and the Philadelphia Orchestra in the summer months. According to the City Council Board (2001), it is this “balance of economic and sociological assets that makes Saratoga Springs an attractive destination with an active, year-round residential and business community.” Recent Census Data from 2000 confirms that Saratoga is a desirable location for new residents. The City’s population has risen nearly 10% from 1990 levels and is projected to increase nearly another 10% by 2010 (CDTA 2004). Saratoga Springs has shifted to the classification of an urbanized area as a result of this recent population growth (CDTA 2004). The City and County have both undertaken several rigorous development projects to create additional opportunities for expansion in their commercial and residential sectors (ZAB 2004).

In addition to its wealth of summer attractions, Saratoga Springs has always been defined by its natural water resource (NYDEC 1996). As the City has expanded and development increased, however, considerable strain has been placed on the City’s current municipal drinking water source, Loughberry Lake. Concerns over water scarcity have prompted this city, which has always been attributed with possessing a seemingly endless water supply, to consider alternatives to its municipal drinking water source. Two potential alternatives include Saratoga Lake and the Hudson River. While political considerations are slowing the determination of a future water source, politicians including Val Keehn are trying to strengthen conservation initiatives in an attempt to curb the broader problem (Leon 2005). Recognizing the viability of prudent water use habits

in both the long and short term, residents and politicians alike have agreed that the best way to urge consumers to use water more contentiously is to adjust the city's water pricing structure. Under the old water pricing structure, Saratoga Springs charged customers according to a decreasing block rate. Environmental lobby groups were understandably concerned with the ideology this rate system conveyed and consequently applied pressure to the city to change the structure (Jemez y Sangre 2003).

Beginning in early 2004, city residents also began urging City Council to adopt water rates that more fairly reflected water consumption patterns. During a City Council Meeting held on June 1, 2004, resident Peter Looker urged the Council to adopt "fair" water rates by noting the "frivolous use of water" exercised by his neighbors (City Council 2004). Commissioner of Public Works, Thomas McTygue, echoed Looker's grievances in the same meeting encouraging "residents of the City to ask their neighbors to turn off their sprinklers" on rainy days (City Council 2004). While many participants recognized the need for a modified water pricing structure, other meeting participants were less than enthusiastic about the prospect of a more expensive water bill. Resident Thilo Ullman for example was strongly opposed to any increase in charges, claiming that it was the responsibility of the City Council "to provide Saratoga Springs residents with water that is cheap, abundant, safe, and secure" (City Council 2004).

Despite varying degrees of dissension on the topic, the water pricing structure was modified in 2005 and presented in the October 2005 water bill. Rather than the existence of a standard flat rate for the lowest consumers, the new pricing structure was adjusted in such a way as to charge customers in a way that better reflected their actual water use. Specifically, the \$20.90 flat rate was replaced with a \$7.00 service charge (City Council 2005). As a result, customers who use between 0 and 2,000 cubic feet of water are now

charged a consumption fee of \$8.50, for a total rate charge of \$15.50 as opposed to the prior \$20.90 flat rate (City Council 2005). As previously demonstrated, this new breakdown provides lowest water users with a decrease in their total water bill. According to Bill McTygue, Director of Utilities, most residential water customers use between 4,000 and 5,000 gallons. Nearly all consumers will therefore experience an increase in their water bill (Table 1).

Table 1: Quarterly Billings for Residential Customers

Residential Use (cubic feet)	Total Charge in 2004	Total Charge in 2005
1,000	\$20.90	\$15.50
2,000	\$20.90	\$24.00
4,000	\$41.50	\$47.50
8,000	\$82.40	\$87.80
10,000	\$101.50	\$110.50
15,000	\$152.25	\$162.25
20,000	\$203.00	\$214.00
25,000	\$253.75	\$265.75

While noting that it would be impossible to completely distinguish a commercial customer from a residential customer, Bill McTygue stated that the fees would also be divided into residential and commercial categories (City Council 2005). The fee structure for the commercial category was initially designed to charge commercial customers in a continuous and incremental way; however, the rate structure was later redesigned to have descending rates throughout the industrial consumption level (City Council 2005). Bill McTygue argued that the highest users should not be penalized disproportionately for

their water use (City Council 2005). According to Thomas McTygue, Commissioner for the Department of Public Works, despite the descending pricing structure still in place for industry, the higher end users will still be facing significant increases in their water bill ranging from \$350 to \$2,500 per quarter (City Council 2005). A key player in the structural reorganization said it would have been unwise to “turn [big business and local industries] on their back” (Pers. Com. Anonymous 2006).

It should be noted that Saratoga Springs uses a combined water and sewer bill. The sewage bill is approximately 2.5 times higher than the water bill. The discrepancy between the two taxes is attributed to the fact that while water is internally controlled by Saratoga Springs, sewage and waste are outsourced and managed by Saratoga County. While Saratoga County was ranked between 4th and 6th for lowest water prices in New York State, it was ranked considerably higher (16th to 21st) for sewage and waste in almost every consumption bracket due to these external controls. The exception to the trend is found in the highest industrial consumption category wherein Saratoga Springs was ranked 4th and 5th for water and sewage/waste water (Black and Veatch 2001).

The distribution of wealth in Saratoga Springs appears to follow a standard bell-curve (US Census 1999). Approximately 29% of households in Saratoga Springs make less than \$25,000 annually, 26% make between \$25-50,000, 20% make between \$50-75,000, 13% make between 75-100,000, and 13% make over \$100,000 (US Census 1999). Considering the broad distribution of wealth in Saratoga Springs, it is highly likely that the new water pricing structure has affected various economic sectors in different ways. The purpose of this project is to assess the effects of the new water pricing structure on water use and perceptions of water among households of varying incomes.

Methods

In order to stratify sampling across various economic sectors, 2005 Geographic Information Systems (GIS) Parcel data was used. From these data, median household income was determined for each of the City's 27 block groups. Block group is the smallest unit for which for the US Census tabulates data and is usually equivalent to one neighborhood. Household income bracket categories were created to group the block groups with similar household incomes together. The household income bracket categories were as follows: \$0-\$20,000, \$20,000-\$35,000, \$35,000-\$50,000, \$51,000-\$65,000, \$65,000-\$80,00, and over \$80,000.

Using Parcel Data from 2005, residential addresses for each income bracket were also derived. All addresses were entered into an Excel spreadsheet and each cell was assigned a random number. Each cell was then organized in ascending order according to its randomly assigned number. Using a pragmatic approach (taking into account time per survey and total time available), 150 completed surveys were considered to be an appropriate target (W. Fox, personal communication, February 27, 2006). Unable to fully predict response rate, the spreadsheet format allowed as many phone calls as necessary to be made in each income bracket without losing the random nature of the data. Using the Reverse Address Search on whitepages.com, residential phone numbers corresponding to each residential address were then retrieved. The survey was conducted between 9am and 7pm every day of the week, to account for residents with different schedules. A total of three attempts were made to contact the household bill payer. For every unsuccessful call

attempt in the non-response category (busy line, answering machine, no answer, etc) the type of non-response along with the time, date, and day of the week were recorded.

The survey was designed to include both closed and open-ended questions (Appendix I). The survey began by assessing participants' knowledge of the new water pricing structure. If the respondent indicated a confused or limited understanding of the new pricing structure, the interviewer explained or clarified the system's change to ensure that subsequent questions were answered with a baseline of knowledge. Interviewees were then asked if and how their water bill changed, their opinions regarding the change, and whether or how the change has influenced their views of other water related issues. Many interviewees were expected to comment on their sewage fee portion of the combined bill and thus while no direct question were asked, comments were recorded and analyzed when relevant. The survey closed with several demographic questions. All survey question responses were recorded in excel using a coding system.

Survey responses were then entered into the analytic software program SPSS. SPSS was used to conduct statistical analyses, manipulate data, and summarize data through tables and graphs (ITS 2002). Crosstabular analyses were used to assess the correlations between annual household income and reported water bill and water use change. Chi-square tests were used to assess the strength of the relationship and determine asymptotic significance values.

A semi-structured, tape-recorded interview was also held with a major proponent and key player in water structure change to gain a more concrete understanding of the new verses the old water pricing structure (Appendix II). In addition to building a greater baseline of understanding about the fee structure conversion and to acquiring City-level

data on the average water consumption, the interview was also intended to assess the motivations behind the fee structure change.

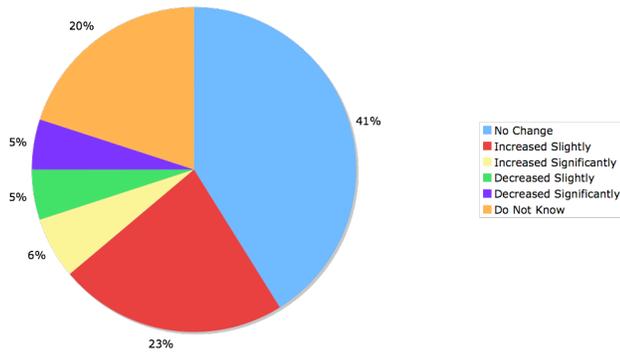
Results

General Distribution

We made a total of 603 phone calls as part of this study. Of the 603 calls, 147 had disconnected or incorrect numbers. An additional 233 of these phone calls were considered irrelevant because they were either non-residential (businesses), linked to a fax machine, or reached a resident that did not pay the Saratoga water bill because of a well, landlord, or location outside of the city limits. Out of the 233 valid phone calls, a total of 81 surveys were completed. Excluding the numbers considered irrelevant, the total response rate was consequently determined to be 22.5%.

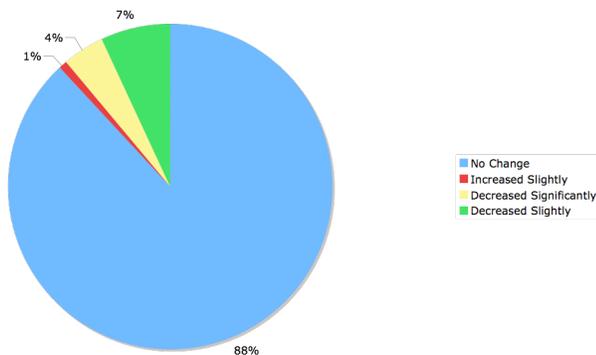
Women constituted 58.0% of the response group. The remaining 42.0% were men. A total of 34.6% of survey participants had completed college and another 44.4% had obtained a post-graduate degree. The mean age of survey participants was 58; the median age was 55. The mean number of persons per household was 2.5 and the median was 2. We found that a significant number of respondents, 41%. reported no change in their water bills since the implementation of the new water pricing structure (Figure 1).

Figure 1: Reported Water Bill Change for All Respondents



The majority of respondents, a full 88%, reported no change in their water use habits as a result of the new water pricing structure. No one reported a significant increase in his or her water use and only one respondent reported that his or her water use had increased slightly since the implementation of the fee structure. Approximately 11% of our respondent pool reported a decrease in their water use, whether slight or significant, as a result of the new structure (Figure 2).

Figure 2: Reported Water Use Change for All Respondents

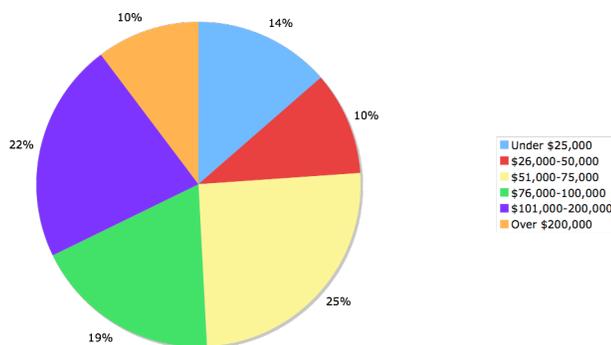


Income Status and Survey Responses

Although 81 residents participated in our survey, only 73% (59 respondents) agreed to answer the household income question. Only 56% (33 out of 59) of those

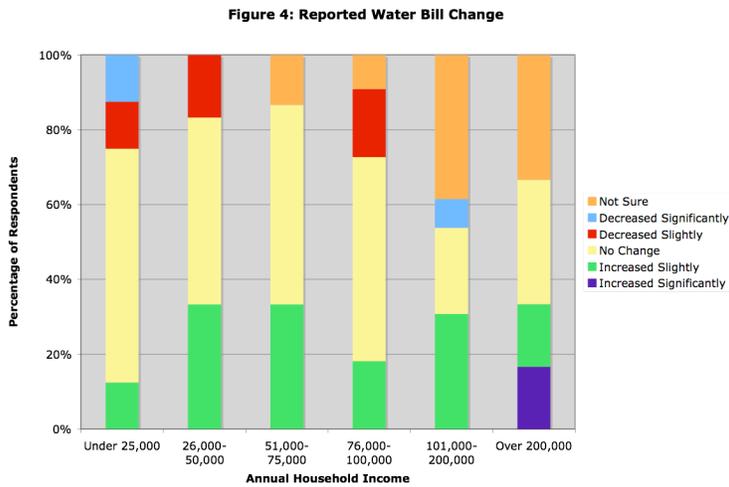
respondents who answered the household income question actually fell into their designated GIS income block group. For this reason, we concluded that the GIS Parcel data was an unreliable predictor of median household income. We choose alternatively to use respondents' reported annual household to analyze the possible relationships between economic status and water bill/use change. In the phone survey, residents were asked to select one of six income ranges: Under \$25,000, \$26,000-50,000, \$51,000-75,000, \$76,000-100,000, \$101,000-200,000, and over \$200,000. For the purpose of our data analysis, respondents were grouped according their self-reported income range. Those who refused to report their household income were excluded from our dataset. Eight respondents (13.6%) were in the "Under \$25,000" income bracket. Six respondents (10.2%) were in the "\$26,000-50,000" income bracket. Fifteen respondents (25.4%) were in the "\$51,000-75,000" income bracket. Eleven respondents (18.6%) were in the "\$76,000-100,000" income bracket. Thirteen respondents (22.0%) were in the "\$101,000-\$200,000" income bracket. Six respondents (10.2%) were in the "Over \$200,000" income bracket (Figure 3).

Figure 3: Respondents By Annual Household Income Bracket



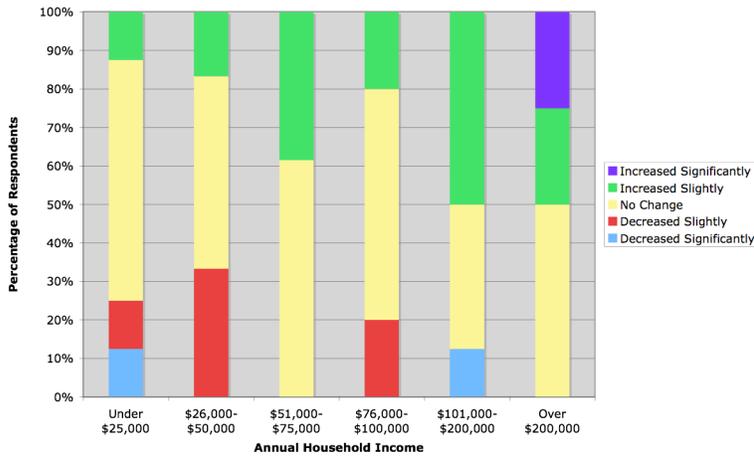
Reported Changes in Water Bill

Roughly the same percentage of respondents in each income bracket reported that their water bills had not changed. A notable percentage of respondents with annual incomes of \$51,000 and higher indicated that they were not sure whether or not their water bills had changed. Those indicating a slight or significant decrease in their bills were scattered. Participants in all income brackets indicated a slight increase in their water bills. Only those participants in the highest income bracket indicated a significant increase in their water bills (Figure 4).



A graph similar to Figure 4 was also created that removed the “not sure” responses. With this group removed, a relationship between water bill increase and income becomes apparent. As income increased, the percentage of respondents reporting an increase (slight or significant) in their water bills also increased, with the exception of the 76-100,000 group (Figure 5).

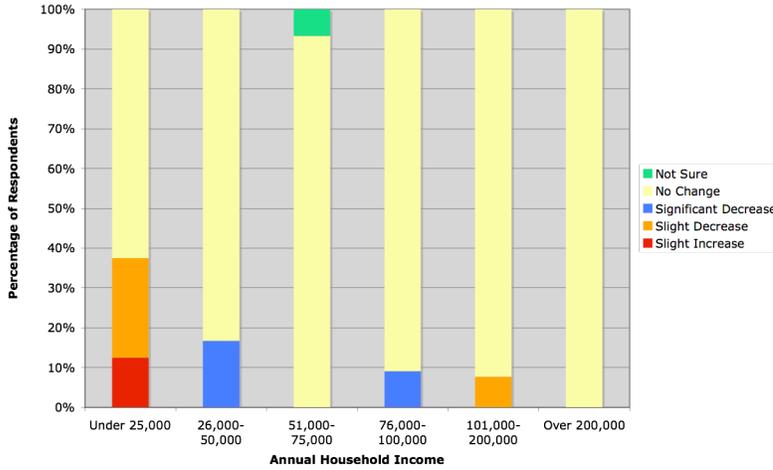
Figure 5: Water Bill Change Without "Not Sure"



Reported Changes in Water Use

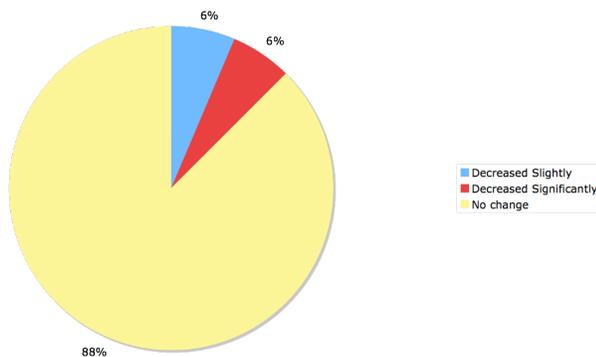
The majority of respondents in all income brackets indicated that their water use habits had not changed as a result of the new water pricing structure. No one indicated that his or her water use had increased significantly and only one respondent in the lowest income bracket indicated that his or her water use had increased slightly. Respondents in five of the six income brackets indicated that their water use had decreased slightly or significantly. As income increased, fewer respondents indicated a decrease in water consumption habits as a result of the new water pricing structure. Only one respondent in the highest income bracket indicated that they were not sure whether or not their water use habits had changed (Figure 6).

Figure 6: Reported Water Use Change



We next explored the influence that an increased water bill might have on an individual's water use habits. We focused exclusively at those survey participants reporting an increase in their water bills. The overwhelming majority of respondents in this group indicated that they did not change their water use habits despite experiencing an increase in their water bills (Figure 7).

Figure 7: Water Use Change of Respondents Reporting Water Bill Increase



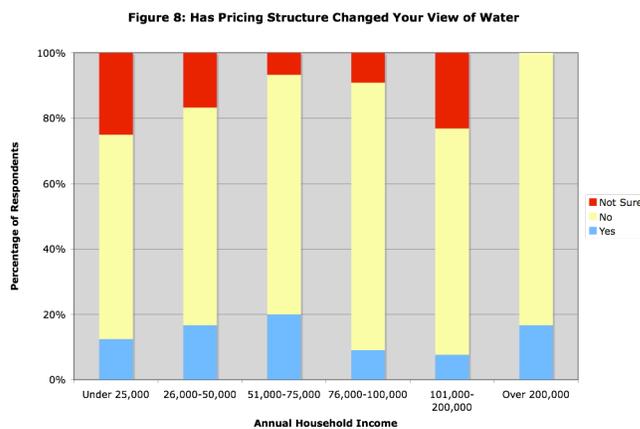
Statistical Tests of Quantitative Data

After completing our survey, we determined that the sample size was too small to

accurately determine statistical significance. A bivariate tabulation function was performed to assess the statistical significance of reported income and reported water bill change Chi Square, the test of statistical significance for bivariate tabular analysis was equal to 29.992. The asymptotic significance value was 0.225. A bivariate tabulation function was also performed to assess the statistical significance of reported income and reported water use change. Chi Square was equal to 27.635. The asymptotic significance value was determined to be 0.118 (Appendix III).

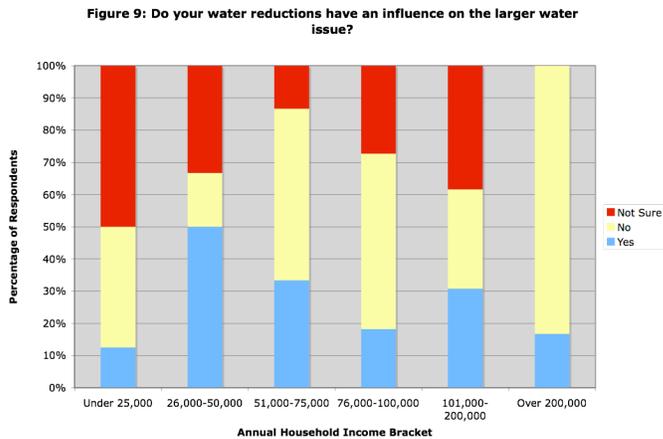
Responses to Qualitative Questions

The qualitative section of our survey consisted of two questions. The first question asked participants whether or not the pricing structure had changed their view of water. A large percentage of respondents in all income brackets reported that “no” their view of water was not altered by the newly implemented system. Every respondent in the highest economic bracket had a decisive opinion regarding the question posed (Figure 8).



The second qualitative question asked whether the respondent believed that his or her reductions in water use would be able to have an influence on the larger water issues

in Saratoga Springs. A full 50% of the respondents in the lowest income bracket replied that they were unsure of their impact. Most of the respondents in the highest income bracket, 85% ,stated that ‘no,’ their personal water consumption would not affect the larger water issues in Saratoga Springs (Figure 9).



Semi-Structured Interview Data

From our semi-structured interview, we obtained documentation outlining the new verses the old fee structures. We were also provided with a copy of Black and Veatch’s 2001 New York Water/Wastewater Rate Survey comparing Saratoga Springs’ old water pricing structure to that of other counties in New York State. Our interviewee also explained the main motivations behind the structural change within the context of the larger Saratoga Springs’ water debate. Our interviewee could not provide us with any information on the impact of the new water pricing structure on residential consumption rates nor could he speculate how different economic sectors may have been affected by the rate change. He stated that the structural change was not controversial and that further modifications in the rate structure are not expected to take place in the near future.

Discussion

Quantitative Analysis

As reported annual household income increased, a higher percentage of respondents in each group reported an increase in their water bills. This may suggest that households of higher economic status consume more water and are consequently absorbing higher water bill costs. A notable percentage of respondents with annual incomes of \$51,000 and higher indicated that they were not sure whether or not their water bills had changed. This might indicate that those who make more money pay less attention to the cost of their water bills or consider the cost to be negligible.

The overwhelming majority of respondents in all income groups indicated that their water use habits had not changed as a result of the new water pricing structure. Even those participants who noticed an increase in their water bills consistently reported that they did not change their water use habits. These data suggest that the new fee structure has done very little to capture residential consumers' attention or increase residential customers' water conservation practices. While a well-designed rate structure should maintain affordable rates for the modest consumer, residents who observe slightly more wasteful water use practices should be discouraged from doing so by receiving a more expensive water bill (WRA 2004). Were the new water pricing structure well-designed, the results of this analysis would suggest that most residential customers in Saratoga Springs are "modest consumers." While further studies must be conducted, there is reason to believe that this is not the case.

Qualitative Analysis

There were several trends and themes evident when analyzing the responses we received to our qualitative questions. The first qualitative question asked whether the new pricing structure had changed the respondents' view of water. This question resulted in answers indicating that regardless of annual household income, most respondents' view of water was not altered by the newly implemented system. Another point of interest was that every respondent in the highest economic bracket had a decisive opinion regarding the question posed. The most frequently occurring trend, when analyzing the responses to the first qualitative question, was the idea of water as a commodity. This theme was apparent in all income brackets. For example, a quote that is highly representative of many of the answers we received came from a 23 year-old male in the under \$25,000 annual household income bracket who said: "Water is a human right. Now it is being treated as more of a commodity."

The second qualitative question asked whether the respondent believed that his or her reductions in water use would be able to have an influence on the larger water issues in Saratoga Springs. Some interesting trends to consider are the fact that 50% of the respondents in the lowest income bracket replied that they were unsure of their impact. Conversely, no one in the highest income bracket appeared to express significant hesitation in his or her response. Also worth noting is the fact that 85% of the respondents in the highest income bracket stated that 'no,' their personal water consumption would not affect the larger water issues in Saratoga Springs.

There were many reoccurring themes that stood out in response to the second qualitative question but one of the most interesting was the trend of respondents who believed themselves exempt from personal responsibility. Respondents in different

income brackets felt exempt for different reasons. In the lower income brackets, many respondents stated that their water use was paltry in comparison to Saratoga's total water consumption. Respondents in the higher income brackets expressed a similar sentiment but also indicated that they had more water-intensive household practices than they cared to admit. One example of this trend is evident in the following quote from a 43 year-old female in the over \$200,000 annual household income bracket who said: "[I don't think my consumption affects the larger water issues in Saratoga Springs] because I don't use much water. I mean, I have a sprinkler system and a pool but I can't cut back on the amount of laundry I wash." With the higher residential consumers, a disconnection seemed to exist between the water shortage and their water consumption.

Another interesting theme that stood out in response to the second qualitative question was that of disempowerment. This theme, though present in all income brackets, was particularly evident in the under \$25,000 annual income bracket. The lowest income group relayed answers that indicated a feeling of exclusion from the decision making process. A response that is highly representative of this trend came from a 55 year-old in the under \$25,000 annual income bracket who said: "The City Council hasn't even asked us [to participate]. I feel like I don't matter. We used to have town meetings and now they just don't ask." This negative view is counterintuitive due to the fact that the lowest income bracket disproportionately reported a decrease in their water bill as a result of the new pricing structure.

Sources of Error

There were several possible sources of error in this study. The GIS Parcel Data did not very accurately predict the average household income of each block group.

While an essential part of our methodology for contacting an equal portion of residents from each income bracket, the Parcel data appeared to only correctly predict income half of the time. The phone survey format also automatically excluded those individuals with unlisted numbers or those without telephone service. The study findings indicate that a fairly consistent “type” of person was actually willing to participate in the survey at all. A total of 79.0% of survey participants had completed college and/or graduate school. It is reasonable to assume that those having had the research experience would be more inclined to participate in a student survey. Almost a quarter of survey participants also refused to answer the household income question. Unable to rely on the GIS Parcel data, the income refusal surveys could not be included in the crosstabular analyses.

Conclusion

The results of this study suggest that the pricing structure has done very little to encourage water conservation among its residential users. A full 88% of our survey participants reported no change in their water use habits as a result of the new water pricing structure. Trends and themes we observed in the results of our survey suggest that there may be a relationship between economic status and reported water bill change, water use change, and water perception. Due to our small sample size, however, we were unable to execute statistical tests to determine a correlation between the variables. Further studies should be conducted to increase the sample size. Our findings suggest that GIS Parcel Data does not accurately predict annual household income. For this reason, we recommend that future studies rely upon other means to ascertain this information.

Because survey participants are often hesitant to report their household income, future studies should account for this by generating a significantly larger sample size. Future studies should also be conducted after the new water pricing structure has been in place for several billings. It is expected that after repeated billings, residents will become more aware of the new structure. If the results of future studies continue to suggest that the changes in the structure are not affecting consumption rates, it is advisable that more aggressive structural modifications occur.

Appendix I

Residential Customer Survey

Block group: _____
Phone number: _____
Date/Time: _____

Hi, my name is Elizabeth _____. I am a student at Skidmore College. For my senior project, I am conducting a five-minute survey household water bills in Saratoga Springs. Would you be willing to participate in this brief questionnaire?

Are you the member of your household responsible for paying the water bill? (Is the person responsible for paying the water bill available?)

Are you 18 or older?

(If yes) This survey is treated anonymously but feel free to stop at any time. This survey will take about 5 minutes to complete.

- (If no)
- Water bill payer not available
 - Water bill payer not 18 or older
 - Household not connected to city water system

Thanks for agreeing to participate in our study. I am going to ask you several questions about yourself. I would be glad to repeat any questions that are unclear. Lets get started.

1. Last year, the city changed the way it charges customers for water. The city used to charge a flat rate and now charges customers based on the number of gallons consumed. This change occurred in our October water bill. Are you familiar with the new way that the city charges for water?

a. Y N NS

b. Required further explanation: Y N

c. Are you in favor of this change in the way the city charges for water:

 Y N NS

2. How has your water bill for this quarter, January 2006, changed from your water bill from January 2005?

- Increased slightly
- Increased significantly
- Decreased slightly
- Decreased significantly
- Has not changed

(Don't know)

(2b) If they mention their sewage bill, record response here:

3. How would you say your total water use has changed as a result of the new water pricing structure?

- Decreased slightly
- Decreased significantly
- Increased slightly
- Increased significantly
- Has not changed

Now I'd like to ask you a couple of general questions.

4. Has the pricing structure changed your view of water? (Prompt: How has the new water pricing structure changed your view of water issues in Saratoga Springs?)

5. Do you think your individual reductions in water use have an influence on the larger water issues in Saratoga Springs? (Prompt: If "No", then "why not?" If "Yes" or "Maybe", then "How"?)

Ok, we are almost done. I have a couple of direct questions.

6. In what year were you born?

7. How many people live in your household?

8. What is your gender? (Make a joke).

9. What level of education have you completed? Stop me when I get the correct range.

- Secondary
- High School
- College

- Post Graduate Degree

10. What is your annual household income? Again, stop me when I get to the correct range.

- Under \$25,000
- \$26,000 - \$50,000
- \$51,000- \$75,000
- \$76,000- \$100,000
- \$100,000- \$200,000
- Over \$200,000
- Refuse to Answer

Thank you so much for your time. This information may prove extremely beneficial to future pricing structure policy implemented in Saratoga Springs.

Appendix II

Interview Questions for Semi-Structured Interview

1. How has total water use changed since the implementation of the new water pricing structure? Can you distinguish between commercial/industrial and residential categories? Do you have any breakdowns by categories?
2. What was the purpose of the new water pricing structure? Was it intending to reduce water consumption? If so, was it intended to reduce water consumption in both residential and commercial/industrial categories or was it aimed primarily at commercial/industrial water users?
3. How do you think different economic groups might be affected by the new water pricing structure?
4. How controversial was this restructuring?
5. In what way has the new water pricing structure played into the current water issues in Saratoga Springs?
6. Do you anticipate making any further alterations in the fee structure? Why?
7. How do you expect that total water use will change under the new fee structure as time passes? What about public opinion?
8. Do you suggest we talk to anyone else about the impacts or influence of the new water pricing structure?

Appendix III:

INCOME1 * WATERBIL Crosstabulation

Count		WATERBIL					Total	
		decr sig	decr sli	incr sig	incr sli	no chnge		not sure
INCOME1	101-200	1			4	3	5	13
	26-50		1		2	3		6
	51-75				5	8	2	15
	76-100		2		2	6	1	11
	ovr 200			1	1	2	2	6
	undr 25	1	1		1	5		8
Total		2	4	1	15	27	10	59

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.992 ^a	25	.225
Likelihood Ratio	29.025	25	.263
N of Valid Cases	59		

a. 33 cells (91.7%) have expected count less than 5. The minimum expected count is .10.

INCOME1 * WATERUSE Crosstabulation

Count		WATERUSE				Total	
		decr sig	decr sli	incr sli	no chnge		not sure
INCOME1	101-200		1		12		13
	26-50	1			5		6
	51-75	1			14		15
	76-100	1			10		11
	ovr 200				5	1	6
	undr 25		2	1	5		8
Total		3	3	1	51	1	59

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.635 ^a	20	.118
Likelihood Ratio	20.601	20	.421
N of Valid Cases	59		

a. 24 cells (80.0%) have expected count less than 5. The minimum expected count is .10.

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