

RECREATION, ECONOMIC STATUS, AND PROXIMITY TO SARATOGA LAKE:
SARATOGA SPRINGS RESIDENTS' VIEWS OF THE PROPOSED MUNICIPAL
WATER SOURCES

By

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ABSTRACT

As Saratoga Springs attempts to accommodate a population increase, new water resources are needed and an assessment of how this may affect the residents of Saratoga Springs is necessary in order to understand the impacts on the community. A quantitative and qualitative survey was conducted which provides insight into how Saratoga Springs residents respond to the proposed new water source of Saratoga Lake or the upper Hudson River. The survey illuminates how recreational activities, household economic levels, and varying distances from Saratoga Lake influence how the community values Saratoga Lake as a resource. This is important an aspect for maintaining the social and environmental sustainability of the resource and the community.

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Introduction

Currently, Saratoga County and the City of Saratoga Springs are involved in a debate regarding the development of a new municipal water source for the City of Saratoga Springs. The need for a new drinking water source has been driven primarily by the implications of population growth within Saratoga Springs on the long-term sustainability of the City's current water sources, Loughberry Lake, Bog Meadow Brook and the Geysers Crest Well Field (The City of Saratoga Springs Water Development Project 2006). According to Census data, the population of Saratoga County grew from 200,635 in 2000 to 212,706 in 2004, indicating a growth rate of 6% (CDRPC 2006). Within Saratoga Springs specifically, the population was 26,186 in 2000, increasing to 27,332 in 2003, indicating a comparable growth rate of 4.7% (CDRPC 2006). Over the next ten years, the growth rate within Saratoga Springs will increase significantly by 11.9% (CDRPC 2006). The projected population increase is likely to put pressure on the current water sources, which have been called "finite, fragile, and unable to support the long term" (Benton 2002).

Accommodating population growth requires the City of Saratoga Springs to explore the most sustainable water resource for the long-term. Currently, the two options up for debate are the use of Saratoga Lake and the upper Hudson River as alternative water sources. The City has proposed the use of Saratoga Lake as a municipal water

source (Benton 2002). This proposal received negative feedback from Saratoga County and residents from other neighboring municipalities that share the lake with the City of Saratoga Springs (The Saratogian February 16, 2006). Saratoga County's proposal of the upper Hudson River was drafted in response to residential concerns regarding restrictions placed on recreation if Saratoga Lake becomes a municipal water source (SLA 2006; The Saratogian September 10, 2006). The type of recreational activities practiced on Saratoga Lake varies drastically by season; however, the activity itself remains fairly constant throughout the year. In the summer months, the lake is an active resource, providing residential boat access, fishing, crew training, and sailing to those living both on and off the lake. Winter on the lake offers different recreational opportunities, where one can observe ice fishing huts, ice skating, and even the occasional all-terrain vehicle. Throughout the seasons, Saratoga Lake provides residents with a social resource and a sense of community. For this reason, recreation has become an element deeply integrated within discourse regarding the use of Saratoga Lake as a municipal water source.

There is an assumption that those residing closer to Saratoga Lake are more concerned about recreation, particularly because the most active individuals are lake-front residents (The Saratogian February 16, 2006). In the Town of Saratoga, 35 to 40 residents wrote the Town Supervisor Robert Hall in an effort to stop the City of Saratoga Springs from using Saratoga Lake as a municipal water source (The Saratogian February 16, 2006). Hall, also a lake-front resident, stated that he is opposed to the City's proposal because if the lake becomes a reservoir, recreation will be limited due to water quality concerns (The Saratogian February 16, 2006). In addition, the Saratoga Lake Association (SLA), a homeowner organization advocating the health of the lake, has voiced concerns

about limitations on recreation that could arise if Saratoga Lake becomes the new municipal water source. In a letter aimed to increase public awareness and gather community support, the SLA states that it “is very concerned that the proposed water withdrawal will affect the health, safety and recreational use of Saratoga Lake” (SLA 2006). Clearly, opposition for the use of Saratoga Lake has mobilized over recreational concerns.

Moreover, opposition from environmental organizations near Saratoga Lake has contributed to the perceived notion that those near the lake are more opposed to its use as a municipal water source. The Saratoga Lake Protection and Improvement District (SLPID) are defined as “a governmental organization responsible for the maintenance of Saratoga Lake’s water quality” (SLA 2006). Prior to the water resource debate, SLPID’s primary role was to collect taxes from lake-front residents to facilitate weed control on Saratoga Lake. However, their concerns have evolved in the face of the water resource debate to include the preservation of recreation on the lake. Ed Dweck, the chairman of SLPID, publicly stated in 2005 that he is “concerned about recreation” despite what the Draft Environmental Impact Statement (DEIS) says (The Saratogian October 21, 2005). Clearly, Ed Dweck and other members are skeptical of the DEIS and have new concerns that focus on safeguarding their recreational abilities on Saratoga Lake.

According to the City’s DEIS, “the Saratoga Lake alternative meets the City’s long-term and emergency back-up needs, is the most affordable option for the public, and would have minimal impacts on the environment” (Barton & Longuidice, P.C. 2001). In the Scoping Responsiveness Document (the precursor to the DEIS) prepared by the City of Saratoga Springs in 2001, acknowledged “that the lake is used for a wide range of

recreational activities” (Barton & Longuidice, P.C. 2001). Furthermore, the document states that “there would be no need to significantly restrict current recreational uses of Saratoga Lake if it were to be used as a public water supply” (Barton & Longuidice, P.C. 2001). This was confirmed with the DEIS from 2003, as the potential environmental impacts and mitigation measures indicate that it would not be necessary to restrict recreational uses of Saratoga Lake. However, a Draft Study for SLPID conducted in 2001 and cited in the DEIS, “suggests that it may be appropriate to limit boat traffic on Saratoga Lake for purposes of boating safety and recreational enjoyment.” Therefore, the City of Saratoga Springs holds that if future restrictions are to be made, they would likely be to “protect the boating public rather than to protect water quality” (DEIS 2003). Evidently, the City of Saratoga Springs sees the importance of protecting the recreating public and claims that restrictions imposed on the Lake would be to ensure their safety while visiting the Lake.

The City of Saratoga Springs and its residents as well as neighboring municipalities share concerns over the preservation of Saratoga Lake as a recreational resource. Residents believe that preserving Saratoga Lake ensures the sustainability of a deeply embedded recreational culture that they have come to value. The purpose of this study is to evaluate the publics’ inherent value of Saratoga Lake and the recreational culture that has been created. Specifically, Saratoga Springs inner and outer district residents are examined regarding how recreation, economic status, and proximity to Saratoga Lake influences their value of Saratoga Lake, as well as how all three inform public opinion on the use of Saratoga Lake or the upper Hudson River as municipal water sources. This study uses residential surveys that measure residents’ attitudes and

opinions of the water resource debate to inform stakeholders in the municipal water source debate. Guy and Rogers (1999) found that organizing survey efforts around a community's environmental, economic, and social needs helped elected officials identify the interdependence in all three areas. Relying on this approach, this study provides socio-economic data that shows how Saratoga Lake has come to be valued as a recreational resource. Finally, in order to situate the socio-economic data within a broader geographic context, this study provides stakeholders with a visual representation of the distribution of recreation participation through Geographic Information Systems (GIS). Aspinall and Pearson (2000) found GIS to be useful by situating site-specific indicators within a broader geographic context. Access to the Saratoga County Office of Real Property Service residential parcel information combined with the GIS program situated Saratogians' specific recreation activities within varying geographic proximities to Saratoga Lake.

Previous research has indicated that recreation is an integral part of maintaining social sustainability within a community (Guy and Rogers 1999). Social sustainability involves issues that affect residents' quality of life (Guy and Rogers 1999). It includes population density, adequate housing, education, recreation, culture, welfare, and a myriad of other social conditions (Luther 1997). Given the projected population increase within the City of Saratoga Springs and Saratoga County, several of these conditions are areas of concern because economic development cannot be sustained when a community's social environment fails to meet quality of life expectations (Bonnett 1993). Another facet of a community's culture that affects social sustainability is residents' feelings about their community (Eliason, Rogers, and Geertsen 1992). Information about

residents' opinions, behaviors, and attitudes can provide the human and social perspective that helps identify activities and practices important in sustaining communities (Guy and Rogers 1999). Inevitably the use of Saratoga Lake or the upper Hudson River will affect the character and Saratoga Springs' sense of community.

Quantitative and Qualitative Methods

In order to gain a quantitative understanding about whether or not recreation, economic status, and proximity to Saratoga Lake influence public opinion about the proposed water resources, we use primarily quantitative data with some supplemental qualitative data.

The combination of quantitative and qualitative data is a process known by social scientists as triangulation (Todd 1979). Triangulation involves the use of multiple methods to research the same phenomenon. The idea is for the weaknesses in any one method to be compensated for by the strengths of another (Todd 1979). We conduct a full-scale quantitative survey study, which is then informed by an open-ended qualitative question included at the end of the survey. This question is placed at the end of the phone interview in order to offer the participant a moment to speak openly about the water resource issue.

Preliminary Qualitative Component

In the first stage of the research, we conduct a series of informal semi-structured qualitative interviews to gain a general understanding of the issues that affect Saratoga Springs residents. These interviews range from 8 to 10 residents who reside within the City of Saratoga Springs (see Figure 1 in Appendix A for reference to city locale). We

select interviewees through the use of convenience sampling, a method that focuses on any individual willing to converse about the subject (Yu and Cooper 1983). We then conduct the informal qualitative interviews in public domains in the commercial district of the city of Saratoga Springs. These preliminary surveys help design a survey that addresses the relevant issues effecting Saratoga Springs residents. We then create a quantitative survey that includes questions on consistent themes and issues that appear during the initial qualitative interviews.

Quantitative Survey with a Qualitative Component

After addressing the public issues, we conduct telephone surveys. We organized the survey into three respective parts (see Figure 2 in Appendix A for survey questions). . The first part of the survey includes questions regarding specific recreational activities performed by Saratoga Spring's residents on the Lake. These questions took into account the seasonality of recreation and include questions about each season. The second part includes demographic questions. Finally, as a way to create a study based on triangulation, an open-ended question supplements the quantitative information with additional qualitative information. The structure of this question varies based on the participants' responses during the survey. After conducting all the surveys, we review the responses to the qualitative question and create a typology that represents consistent themes that would supplement and inform the quantitative data.

Survey Coding System

We construct an incremental survey with a coding system that is assigned to each question. For example, ID1, “Do you use Saratoga Lake for recreation?” is assigned two numerical values, a value of 1 (one) assigned to “yes” and a value of 2 (two) for “no” (See Figure 2 in Appendix A for specifics). For more complex issues such as annual income, we break the coding system into six numerical increments. Each question’s coding system accounts for all possible responses. Regardless of the complexity of the issue, each question included a coded response for non-applicable responses, confused responses, and refusals. ID3, a question about the gender of the participant, has an alternate coding system which does not fit general coding system. For ID3, we assume the gender and record this so as not to offend the participant (Interview with Bill Fox, conducted 23 February 2006).

This coding system facilitates the quantitative analysis and organizes the data for entry into SPSS (Statistical Package for the Social Sciences); a software system used by social scientists for data management and analysis. SPSS performs multivariable statistical analyses and sorts and merges files for data manipulation (SPSS 2006). The time constraints of this project demands fast processing; SPSS dealt automatically with the complex data sets created during the analysis process (SPSS 2006). We used SPSS to run cross tabulations to assess correlations between the variables of recreation participation, economic status, Saratoga Springs resident opinion of the proposed municipal water sources and proximity to Saratoga Lake. In addition, we used SPSS to conduct frequency tests and to compute means, standard deviations, and p-values for data sets.

Determining Proximity to Saratoga Lake

The survey evaluates a stratified random sample of residential households in Saratoga Springs. We use Geographic Information System (GIS) to create five, one and a quarter mile geographic buffer zones that measure and map differing proximities from Saratoga Lake. A buffer zone is a key aspect of a stratified random sample as it allows researchers to organize the total sample population into smaller geographical zones (Babbie 1992: 215). Earl Babbie (1992) holds that stratification by geographical location increases representation in various groups such as social, ethnic, or recreational groups. The use of buffer zones provides a more representative sample in terms of socio-economic status and public opinion.

We restrict the buffer zones established for this study to Saratoga Springs' inner district and outer district (see Figure 1 in Appendix A). The study focuses solely on Saratoga Springs as a way to assess citizens' opinions regarding the proposed municipal water sources. Saratogians' opinions are more relevant within the context of Saratoga Springs since the issue originated in and continues to be subject of discussion within the City of Saratoga Springs. Fundamentally, Saratogians' are the most affected by the proposed municipal water resources due to tax increases, property value declines, and potential restrictions on recreation (The Saratogian February 16, 2001)

The Saratoga County of Real Property Service provided land parcel data from 2005 for Saratoga's inner and outer districts in the form of shapefiles. These are visual representations of demographic data that are uploaded into GIS to generate a visual reference for parcel information. The attribute table associated with the parcel information provides further demographic information, specifically the location and

zoning classification of each residential parcel within Saratoga Springs. The Office of Real Property Service of Saratoga County provides a zoning classification for each parcel, categorized generally as residential, commercial, agricultural, or industrial. We consider only residential land parcels as potential survey participants and make no distinctions between renters or homeowners; both are considered.

Stratified Random Sampling

We generate a sampling frame of 30 residential parcels for each of the five buffer zones, resulting in a total sample size of 150. To begin the stratified random sampling, we assign numbers to each parcel within the sampling frame of the five individual buffer zones. We use a random number generator to select a total of 30 random numbers which are assigned to residential parcels within each buffer zone (True Random Number Service 2006). GIS generates a spreadsheet consisting of the total number of residential parcels within each buffer zone and a corresponding numerical value for each parcel in ascending order. The values begin with zero and continue through the full list of residential parcels within the buffer. Then, we enter the addresses of each residential parcel into an electronic telephone directory to generate phone numbers. Addresses were entered into an online phone directory immediately after generating the random numbers (Whitepages.com 2006). For addresses that came up as unlisted, we generate another random number to account for the unlisted number. This process continues until we arrive at a sampling frame of 30 residential parcels. In their 2005 study conducted under the same time constraints, DiSciacca and Reiss found that the same online phone directory was a successful means of generating phone number (DiSciacca and Reiss

2005: 6). In addition, Yu and Cooper (1983) found that telephone surveys and personal interviews are the most effective means in generating responses when compared with that of postal mail surveys. Our study attempts to replicate the successes of both research teams.

Once the sampling frame is complete for each of the five buffer zones, both researchers conduct the telephone surveys independently from one another. The telephone surveys are conducted randomly within a three and a half week period (March 2, 2006 to March 27, 2006) between the hours of 12pm and 7pm on various days of the week. This accounts for individuals with different schedules (DiSciacca and Reiss 2005: 6). Each telephone number is called a total of four times in order to increase the response rate. If there is no answer after the fourth phone call, the residential parcel is excluded from the data analysis process.

Quantitative Survey Results

The results of the survey and the qualitative interviews seek to determine how Saratoga Springs residents' opinion is formed on the use of Saratoga Lake or the upper Hudson River as municipal water sources. In order to test the statistical significance of our study, we performed Chi-square and asymptotic significance tests for each cross-tabulation. We defined statistical significance as $p < .05$ (Babbie 1992). Table 1, found below, provides the p-values for each cross-tabulation between the control and outcome variables.

Table 1:

Statistical Significance of Crosstabulations			
Outcome Variables	Control Variables		
	Recreation Participation	Proximity	Income Status
In the Summer Months	p<0.001 - Significant		
In the Winter Months	p<0.031 - Significant		
Indicator of Public Opinion on the Use of Saratoga Lake	p<0.044 - Significant	p<0.920 - Not Sign.	p<0.437 - Not Sign.
Indicator of Public Opinion on the Use of upper Hudson River	p<0.069 - Not Sign.	p<0.969 - Not Sign.	p<0.451 - Not Sign.
Indicator of Recreation		p<0.442 - Not Sign.	

During the data collection process, 150 residential households we called out of the total 8,687 residential households in Saratoga Springs. We surveyed 65 residential households, resulting in a total response rate of 43.3 percent. The response rates for each buffer vary respectively with a mean response rate of 41.65 percent (See Table 2 in Appendix). Of those who were surveyed 49.2 percent were male and 50.8 percent were female. A typical respondent held an undergraduate degree, was between the ages of 46 and 64, and declared an annual income of above \$81,000.

Figure 3:

**Saratoga Springs Residents Opinion:
The Use of Saratoga Lake and the upper Hudson River**

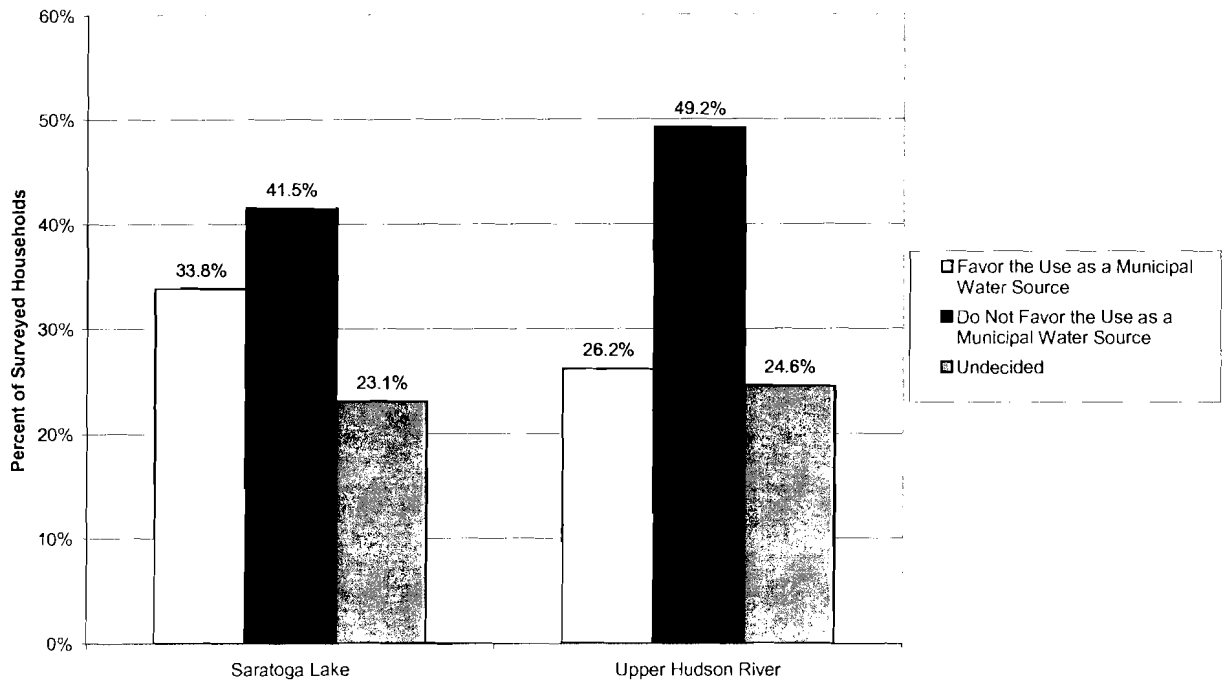


Figure 3 shows the spread of public opinion between the use of Saratoga Lake and the upper Hudson River as municipal water sources. When asked to indicate a preference of the use of Saratoga Lake or the use of the upper Hudson River as a municipal water source, 33.8 percent favor the use of Saratoga Lake and 26.2 percent favor the use of the upper Hudson River. Of those who voiced opposition, 41.5 percent do not favor the use of Saratoga Lake and 49.2 percent do not favor the use of the upper Hudson River. Finally, 47.7 percent of Saratoga Springs residents were undecided about either option.

Variable 1: Recreation Participation on Saratoga Lake

Of the 65 total respondents, 47.7 percent indicated that they recreate on Saratoga Lake, while 52.3 percent indicated that they do not recreate on the lake. Of those who recreate on the lake, 43.1 percent tend to do so in the summer months. Only 6.2 percent of the total sample population indicated that they recreate in the winter months. Therefore, winter represents the time of year with the least amount of recreation participation on Saratoga Lake. In the summer months, the most common recreational activities performed by Saratoga Springs residents are swimming, motor boating, and fishing.

Figure 4:

Distribution of Recreational Activities by Buffer

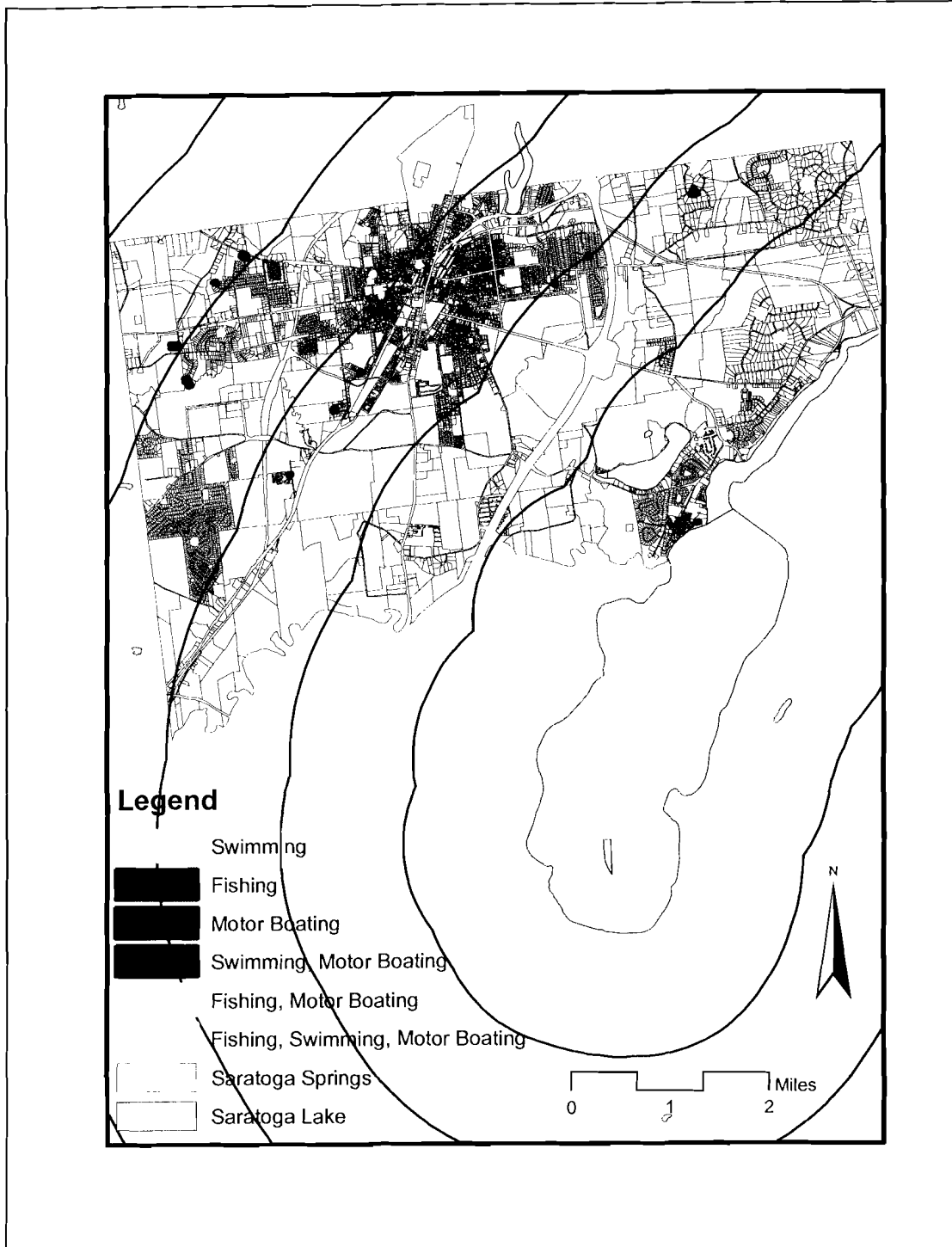


Figure 4 provides a visual representation of the distribution of recreational activities across each of the five buffers respectively. Amongst the 47.7% of residents who indicated that they recreate on Saratoga Lake, swimming, motor boating, and fishing were the most common activities. The majority of the residents who recreate fall within Buffer 3 and Buffer 4, as indicated by Figure 4. Some residents indicated that they recreate in more than one activity. To account for the variations, we grouped residents accordingly. The recreational categories include swimming, fishing, motor boating; swimming and motor boating; fishing and motor boating; and swimming, fishing, and motor boating. Different colors correspond to the different categories of recreational activities, as indicated by the legend. This visual distribution of recreational activities reveals that recreation on Saratoga Lake is an activity that residents throughout Saratoga Springs community partake in.

Figure 5:

Recreation Participation as an Indicator of Household Opinion of the Use of Saratoga Lake as a Municipal Water Source

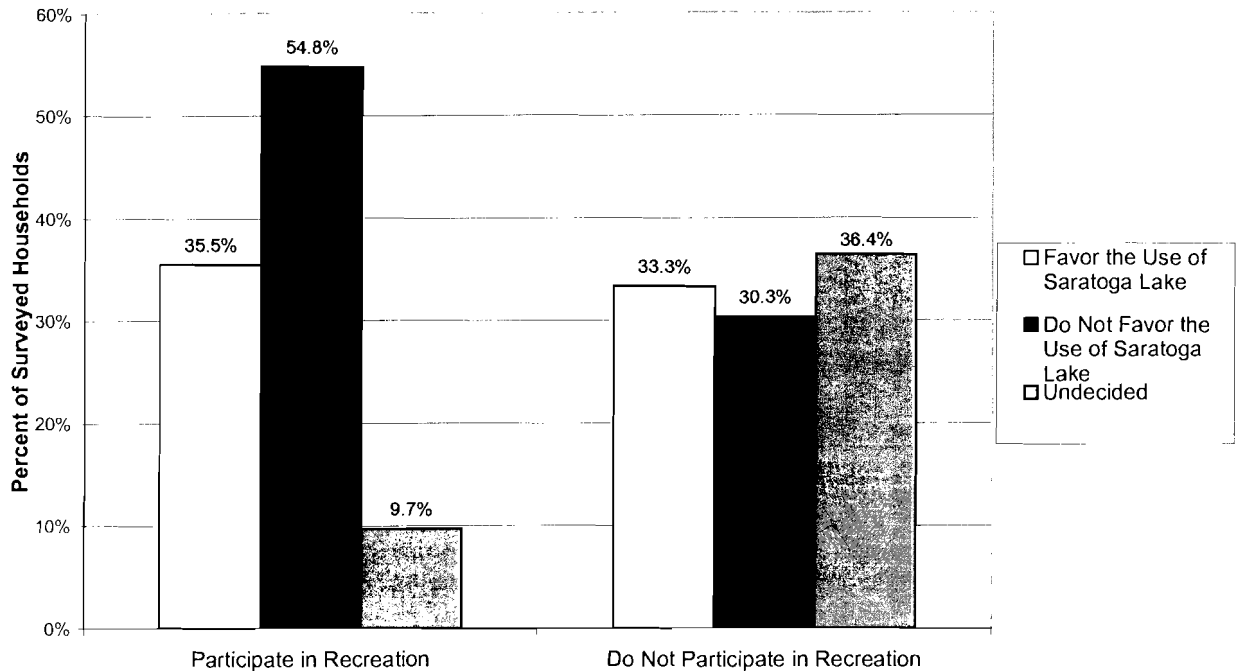


Figure 5 compares the significantly associated relationship ($p < 0.044$) between recreation participation and opinion of the use of Saratoga Lake as a municipal water source. Clearly, the majority of those who recreate are not in favor of the use of Saratoga Lake as a municipal drinking water source. Of those who recreate on Saratoga Lake, 35.5 percent of the respondents favor the use of Saratoga Lake as a municipal water source, 54.8 percent do not favor the use of Saratoga Lake, and 9.7 percent stated that they were undecided. Of those who do not recreate of Saratoga Lake, 33.3 percent favor the use of Saratoga Lake, 30.3 percent do not favor the use of Saratoga Lake and finally,

36.4 percent were undecided. Our data suggests that those that indicated that they do not recreate on Saratoga Lake are more undecided about the municipal water sources.

Figure 6:

Recreation Participation as an Indicator of Household Opinion of the Use of the upper Hudson River as a Municipal Water Source

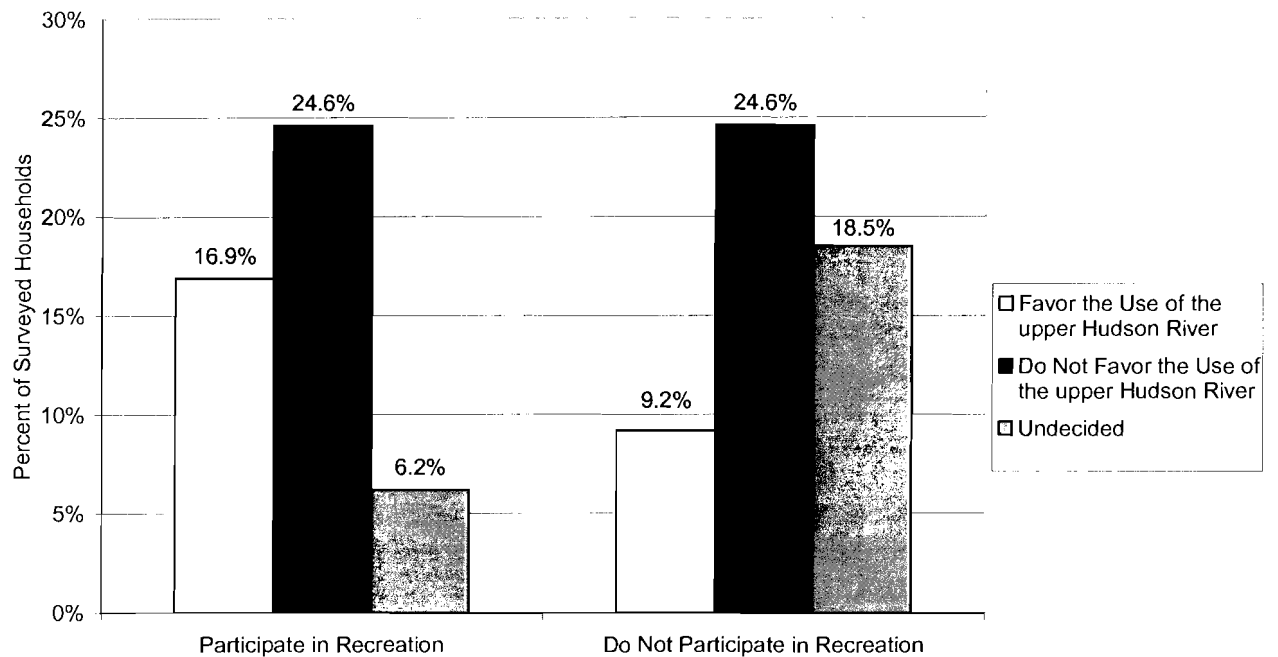


Figure 6 compares participation in recreational activities and household opinion of the use of the upper Hudson River as a municipal water source. The relationship between the two variables was not found to be significant ($p < 0.069$); however, the data suggest that the Hudson is not a favored municipal water source. Out of the total number of respondents that indicated they recreate on Saratoga Lake, 16.9 percent favor the use of the upper Hudson River as a municipal water source, 24.6 percent do not favor the use

of the upper Hudson River, and 6.2 percent were undecided. Of those who do not recreate on Saratoga Lake, 9.2 percent favor the use of the upper Hudson River, 24.6 percent do not favor the use of the upper Hudson River and 18.5 were undecided. Again, those that do not recreate on Saratoga Lake are more undecided about the municipal water sources. But, in general, the upper Hudson River does not seem to be favored by Saratoga Springs residents, regardless of recreational participation.

Variable 2: Proximity from Saratoga Lake

Figure 7:

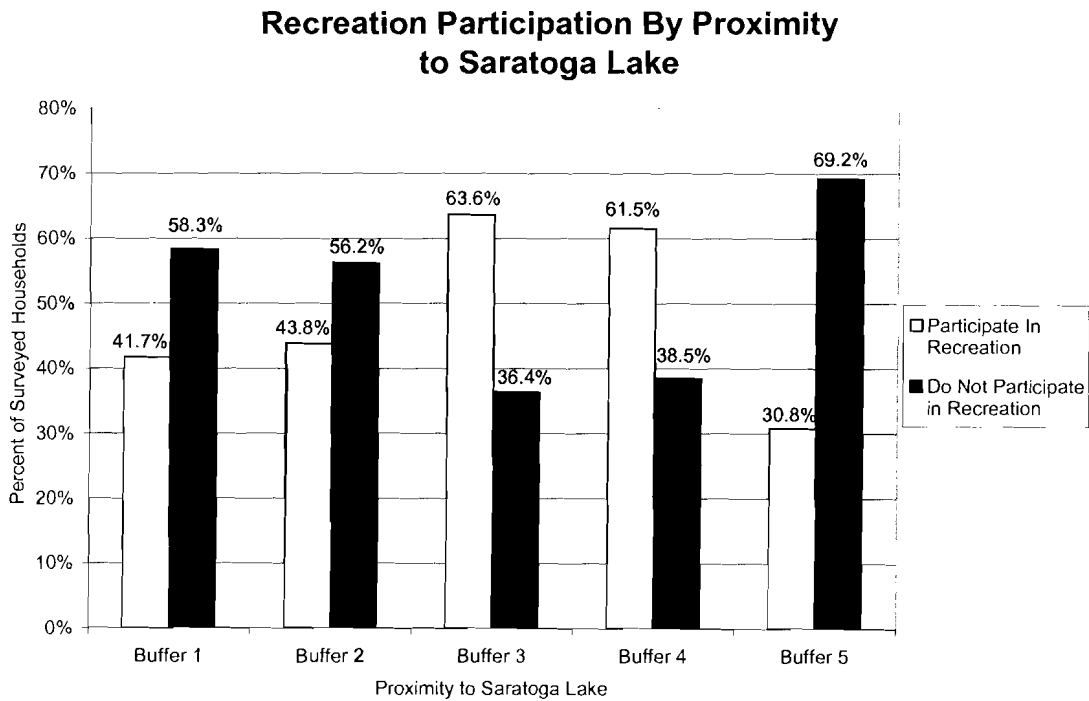


Figure 7 shows the distribution of recreation across all five buffers. While the relationship is not significant ($p < 0.442$), in general, those that live farther away from Saratoga Lake recreate more than those residing on or near the lake. Saratoga residents

living in Buffer 3 (between 3.75 miles and 5.00 miles from Saratoga Lake) have the highest frequency of recreation participation with 63.6 percent. Buffer 5 represents the lowest frequency of recreation participation with 30.8 percent. The majority of residents in Buffers 1 and 2 indicated that they did not recreate on the lake.

Figure 8:

**Opinion on the Use of Saratoga Lake
as a Municipal Water Source
According to Proximity to the Lake**

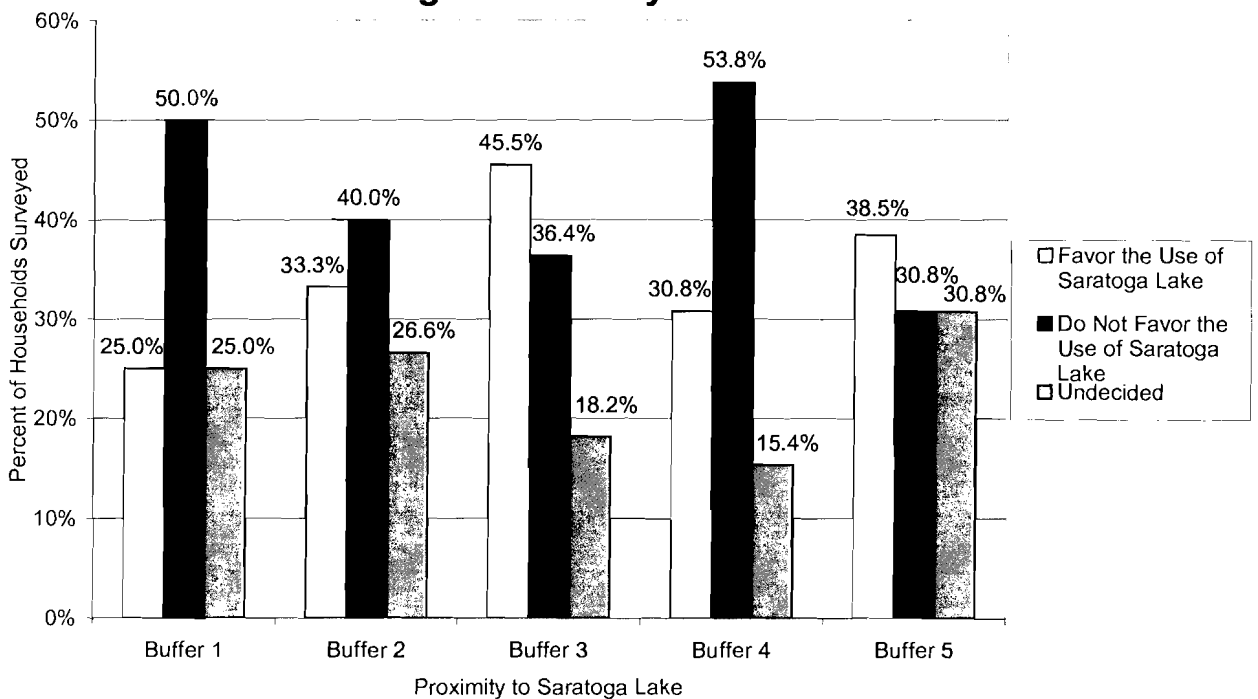


Figure 8 represents opinion on the use of Saratoga Lake as a municipal water source according to buffer. The graph suggests that the majority of those who reside in Buffer 1 (<1.25 miles from Saratoga Lake), Buffer 2 (between 1.25 miles to 2.50 miles from Saratoga Lake), and Buffer 4 (between 3.75 miles and 5.00 miles from Saratoga

Lake) are opposed to the use of Saratoga Lake as a municipal water source. Residents of Buffer 3 (between 2.50 miles and 3.75 miles from Saratoga Lake) and Buffer 5 (between 5.00 miles and 6.25 miles from Saratoga Lake) tend to favor the use of Saratoga Lake as a municipal water source.

Figure 9:

Opinion of the Use of the upper Hudson River as a Municipal Water Source According to Proximity to Saratoga Lake

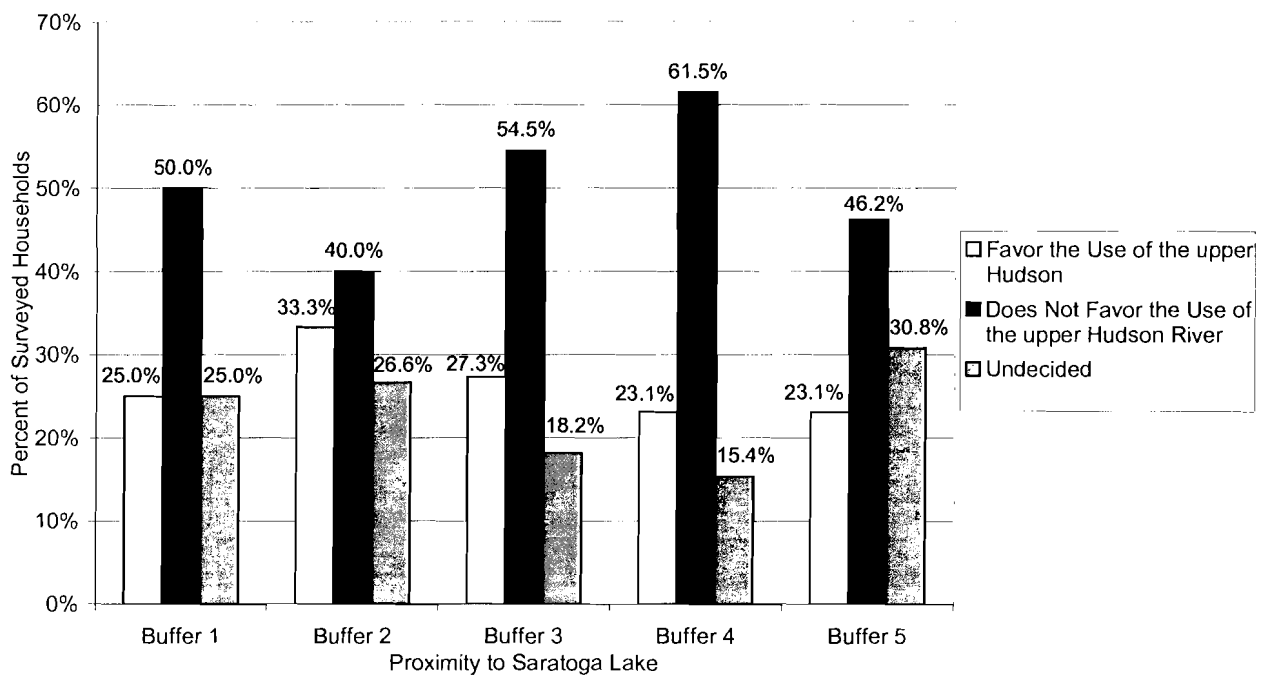


Figure 9 represents opinion on the use of the upper Hudson River according to buffer. While this relationship is not statistically significant ($p < .442$), the data suggest that throughout all five buffers, the majority of the 65 total respondents are opposed to the use of the upper Hudson River as a municipal water source.

Variable 3: Economic Status

Out of the total number of respondents, 6.1 percent have an annual household income of \$20,000 or less, 34.7 percent fall between \$01,000 and \$80,000, and 59.2 percent have an annual income of \$80,000 or more.

Figure 10:

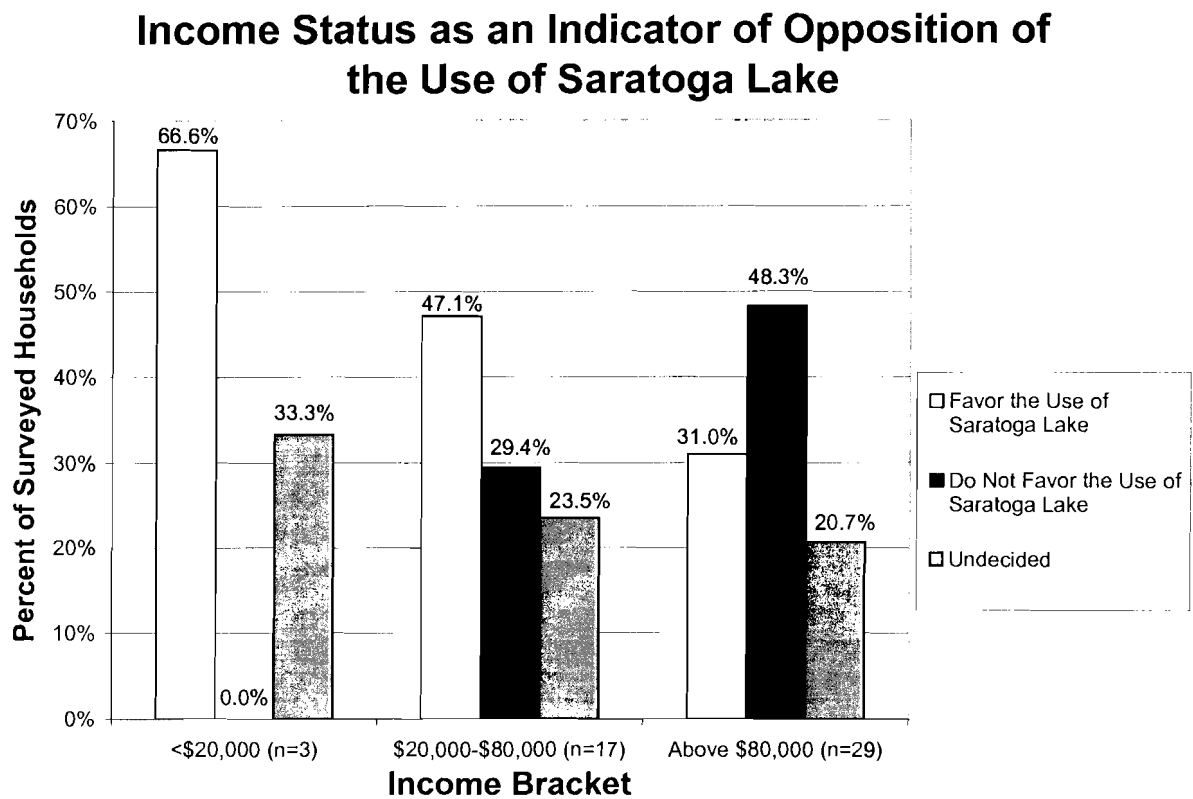
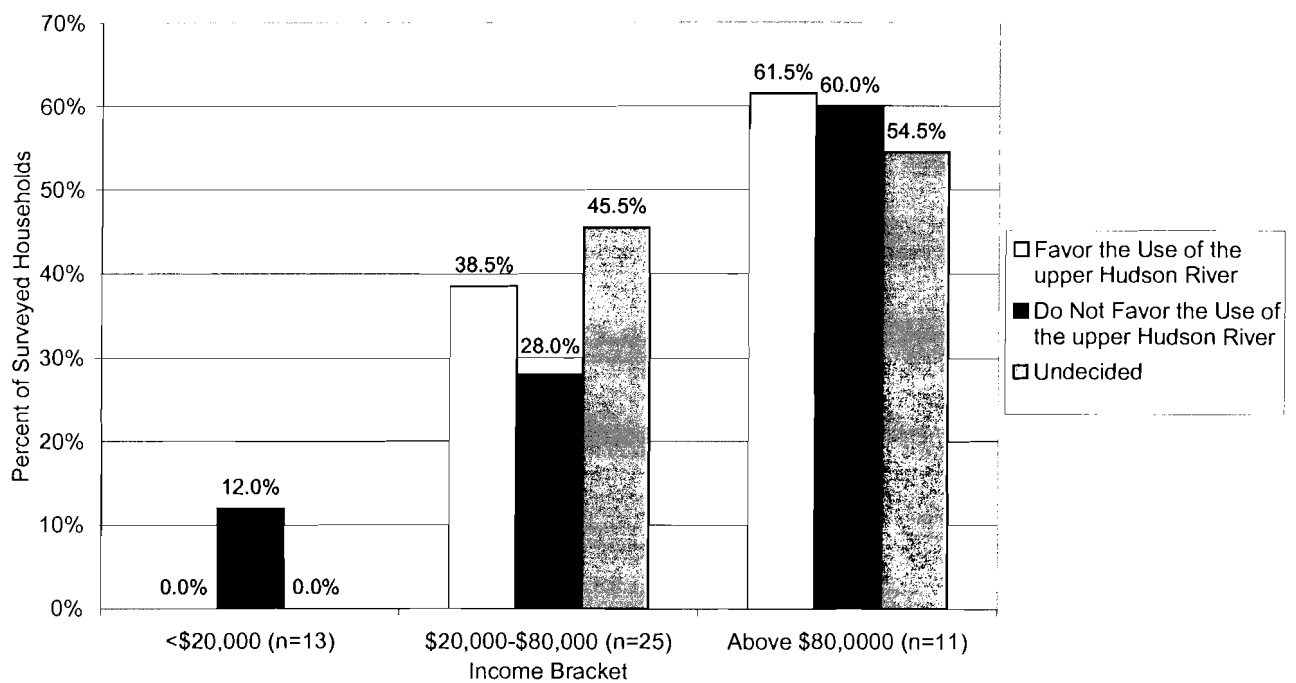


Figure 10 represents opinion on the use of Saratoga Lake as a municipal water source according to indicated household income status. The n-value indicates the number of respondents within the associated income bracket. The majority of the respondents have an annual income of \$80,000 or more. Of these, 48.3 percent do not favor the use of Saratoga Lake while 31 percent favor the use of Saratoga Lake as a municipal water source. Figure 11 represents opinion on the use of the upper Hudson River by income

bracket. In general, the majority of respondents have an annual household income of \$80,000 or more. Of this majority, 60 percent of Saratoga Springs residents do not favor the use of the upper Hudson River while 61.5 percent favor the use of the upper Hudson River as a municipal water source.

Figure 11:

Income Status as an Indicator of Household Opinion on the Use of the upper Hudson River as a Municipal Water Source



Qualitative Typology

Recreation as an Indicator of Opposition

Our data challenges the perceived notion that those who recreate tend to reside close to Saratoga Lake. Judging from our data, the majority of those who recreate on Saratoga Lake live more than 1.25 miles away from the Lake. However, recreation

participation on Saratoga Lake, the focus of many political and community organizations, does correlate with opposition for the use of Saratoga Lake as a municipal water source. Out of the thirty-one Saratoga Springs residents who indicated that they recreate on Saratoga Lake, seventeen opposed the use of Saratoga Lake as a drinking water source, while eleven were in favor. In an attempt to understand the variability in opinions amongst residents who recreate, the following qualitative typology was created based on participants' response to all open-ended questions.

Perceptions of Saratoga Lake as a Finite Resource

Several respondents who participate in recreation perceive Saratoga Lake as a finite resource. A resident of Buffer 2 stated that, "Saratoga Lake is limited in its resources, so I'm opposed to using it for water and waste." A resident from Buffer 3 was concerned that "the water level would vary too much." Finally, a resident in Buffer 2 opposed the use of Saratoga Lake because when compared with the upper Hudson River, the lake is much smaller. For this resident, the upper Hudson seemed better suited to "serve a larger population."

Residents seem to be worried about the long-term sustainability of the resource. Since residents are engaging in primarily water-based recreational activities, water level fluctuations may be perceived by residents as a risk to the sustainability of recreation on Saratoga Lake. Residents seem to question the availability of water in the long term which has some considering the use of the upper Hudson River due to its larger size relative to Saratoga Lake.

“So what, my children are going to come out with three heads?”

However, in general residents oppose the upper Hudson due to health concerns related to PCB contamination. Several residents who indicated that they opposed the use of Saratoga Lake also opposed the use of the upper Hudson River due to their worries about PCBs. After voicing her disapproval of the use of Saratoga Lake, a female respondent residing in Buffer 4 stated that “the idea of PCBs is sketchy...and unearthing all that stuff is just stupid.” A male respondent from Buffer 4 shares similar concerns, namely “the lack of City awareness about the repercussions related to PCBs.” Respondents tended to make general statements about PCBs; very few elaborated on specific health effects which may indicate a general lack of public awareness about the danger of PCB contamination. In fact, only one respondent out of the total 65 was informed about the extraction process. He stated, “the Upper Hudson has PCBs, what are they [the City of Saratoga Springs] gonna do, gorge it out of the bottom? They take 1,000-5,000 years to break down!”

General Ambivalence toward the use of Saratoga Lake

In contrast to the charged views of those opposed to Saratoga Lake and the Upper Hudson, some respondents were apathetic to the attempt to develop a new drinking water resource. A resident of Buffer 2 stated that “it [the use of Saratoga Lake] doesn’t seem like a good idea, but I don’t have much to base it on.” Another respondent seemed to avoid the water issue due to the politics. This respondent stated that “there is so much politics. I kind of just stay away from it.” And finally, some respondents did not believe

that there was a water resource issue at all. One respondent from Buffer 2 believes that “there is no water issue—it’s been created.”

Income Status as an Indicator of Opposition

With regard to income status, our data demonstrates that the higher the income status, the less one favors the use of Saratoga Lake as a municipal water source. Those who indicated an annual household income of above \$80,000 were more opposed to the use of Saratoga Lake than those of the lower income brackets. One respondent who indicated an annual income above \$80,000 stated that she “had a problem with the lake because of the increasing nitrate concentrations and other pollutant that it has.” Another respondent indicated that “once you take water out of the lake, there are issues about what goes into the lake, despite what public works say.” In this instance, there seems to be concern over the control of the Saratoga Lake and privatization.

Discussion

The small sample size of 150 proves to be the most problematic aspect of this study, namely due to the difficulty computing the statistical significance of cross-tabulations. In fact, the correlation between recreation participation and household opinion of the proposed municipal water sources (Figure 5) is the only relationship we found to have associated statistical significance where $p < 0.044$. While the study results in a general lack of statistical significance, it secures a significant response rate of 43.3%, relatively high when compared with the social research standard of 25% (Babbie 1992).

In addition to the small sample size, there are other confounding factors in the quantitative survey, specifically the limitations associated with the use of *whitepages.com* to generate telephone numbers. Utilizing a telephone directory such as *whitepages.com* has been shown to increase the margin of error, as it will not include new subscribers or unlisted numbers (Babbie 1992: 210). In addition, there is a social class bias associated with the use of telephone directories as poorer people are less likely to have phones and those of a high economic status may have more than one telephone line (Babbie 1992: 210). While such biases compromised the validity of this project, telephone interviews prove to be a successful means of data collection (DiSciaccia and Reiss 2005: 6) and was the most feasible method considering the time restrictions.

Our data demonstrates the complexity of variables associated with the formation of public opinion and brings the role of recreation to the forefront. Data indicates that proximity to Saratoga Lake is a factor influencing recreation participation. Interestingly enough, lake-front residents participate in recreation to a lesser degree than those residing off the lake. In actuality, it is residents of Buffers 3 and 4 (2.5- 4.0 miles from Saratoga Lake) that represent the highest participation in recreational activities on the lake. This seems to challenge the assumption that those residing directly on Saratoga Lake are more concerned with recreation. In general, increased distance from Saratoga Lake reflects increased use of Saratoga Lake as a recreational resource.

In addition, recreation participation and a high economic status, as suggested by annual household income, indicate opposition for the use of Saratoga Lake as a municipal water source. This may reflect residents concerns about threats to recreation if Saratoga Lake becomes the favored option for a municipal water source. Specifically, residents

seem to be worried about the long-term sustainability of the resource. Since residents are engaging in primarily water-based recreational activities, the idea of water level declines may be viewed as a risk to the long-term sustainability of recreation on Saratoga Lake. The concerns of those with a high economic status reflect concerns over the control of Saratoga Lake by the City of Saratoga Springs. Residents within the income bracket of above \$80,000, which represents the majority, seemed skeptical of the claim made by the City of Saratoga Springs Department of Public Works that no restrictions will be imposed on the lake if it becomes a municipal water source. It seems then that skepticism regarding the use of Saratoga Lake as a water source is shared amongst residents who recreate and those with a high economic status.

In general, Saratoga Springs residents seem to oppose the use of both Saratoga Lake and the upper Hudson River as municipal water sources. This reflects concerns that residents have over both bodies of water. The use of Saratoga Lake has been associated with possible recreation restrictions, limited water resources, and the increased nitrates and other pollutants, while the use of the upper Hudson River has residents mainly concerned about the dangers of PCBs. However, within this opposition, 34.4% favor the use of Saratoga Lake, while a slightly lower 26.2% favor the use of the upper Hudson River as a water source. This suggests that the idea of PCBs influences public opinion, as it is historically significant issue. This sentiment is reflected quite poignantly in a statement provided by one resident, “the idea of PCBs is sketchy...and unearthing all that stuff is stupid.” Many residents seem concerned over the idea of PCBs, however, few seem to understand the specific dangers or the dredging process that is proposed. As a result, the public’s understanding or lack of understanding of the issues at hand may

greatly affect how opinions are formed about Saratoga Lake and the upper Hudson River. It seems that stakeholders need to increase communication and education within the community in order to provide a solution that is beneficial and accepted by the residents of Saratoga Springs.

Quantifying and qualifying residents' opinions can provide valuable information that is important for maintaining the social sustainability of Saratoga Springs' community. A sense of community stems from issues that affect residents' quality of life and how residents' feel about their community (Guy and Rogers 1999; Eliason, Rogers, and Geertsen 1992). By altering an integral aspect of the community, such as recreational activities on Saratoga Lake, the social sustainability of the community becomes compromised. Skepticism about the use of the resources, as indicated by factors such as residential concern over restrictions on recreation, the ability of Saratoga Lake to maintain its water level, and the dangers of PCBs in the Hudson River also affects how residents feel about their community.

Inevitably, the use of Saratoga Lake or the upper Hudson River will affect Saratoga Springs' sense of community. However, policy makers must maintain the community's quality of life expectations, as this directly influences the economic development and social sustainability of the community (Bonnett 1993). Through increasing the level of communication among stakeholders and elucidating residents' opinions, behaviors and attitudes, important human and social perspectives can be revealed to help identify practices that are important in sustaining the community.

What Lies Beneath the Residents' Opinions?

In a study on effective watershed management strategies, Morton and Padgitt (2005) introduce several frameworks for reviewing ecosystem-social relations, namely social sanctions, sense of place, civic structure, and cultural differences. They hold that beneath socio-economic frameworks are the attitudes, beliefs, values, and norms of community members. These are the aspects of social life that can influence public opinion of the proposed municipal water sources. What is important to note is that all relevant socio-economic information exists within the community of Saratoga Springs; however, the data has limited uses without an organized conceptual framework. The quantitative and qualitative data from this research pursuit creates a conceptual framework that stakeholders can refer to with regard to the new municipal water source proposal (Letey 1999; Morton and Padgitt 2005).

As Saratoga Springs attempts to accommodate the population increase and the subsequent increase in recreation, they must take an integrated approach that addresses the social, economic, and environmental sustainability of the lake and the surrounding communities. More importantly, policy makers need to address the complexity of the water resource issue in relation to the social sustainability of Saratoga Springs by examining different variables in addition to those examined in this study. Finally, data suggests that if stakeholders wish to reach a balanced decision, they must increase communication and education about the water source proposals throughout the City of Saratoga Springs specifically as well as throughout Saratoga County.

Suggestions for Future Studies

The time constraints of this project limited the sampling of a larger population and restricted the study to a sample size of 150. It has been shown that to achieve a confidence level of 95% for each question, one must sample at least 400 people (Babbie 1992: 201). Future studies might find that increasing the population size improves the statistical significance of the study. Moreover, future researchers may find that increasing the duration of the data collection process to a year long study would help secure a larger sample population. Finally, future studies that see an importance in limiting associated biases may choose to conduct mail surveys or personal interviews.

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Appendix A

Figure 1: Map of Survey Area – Saratoga Springs Inner and Outer Districts with Proximity Buffers

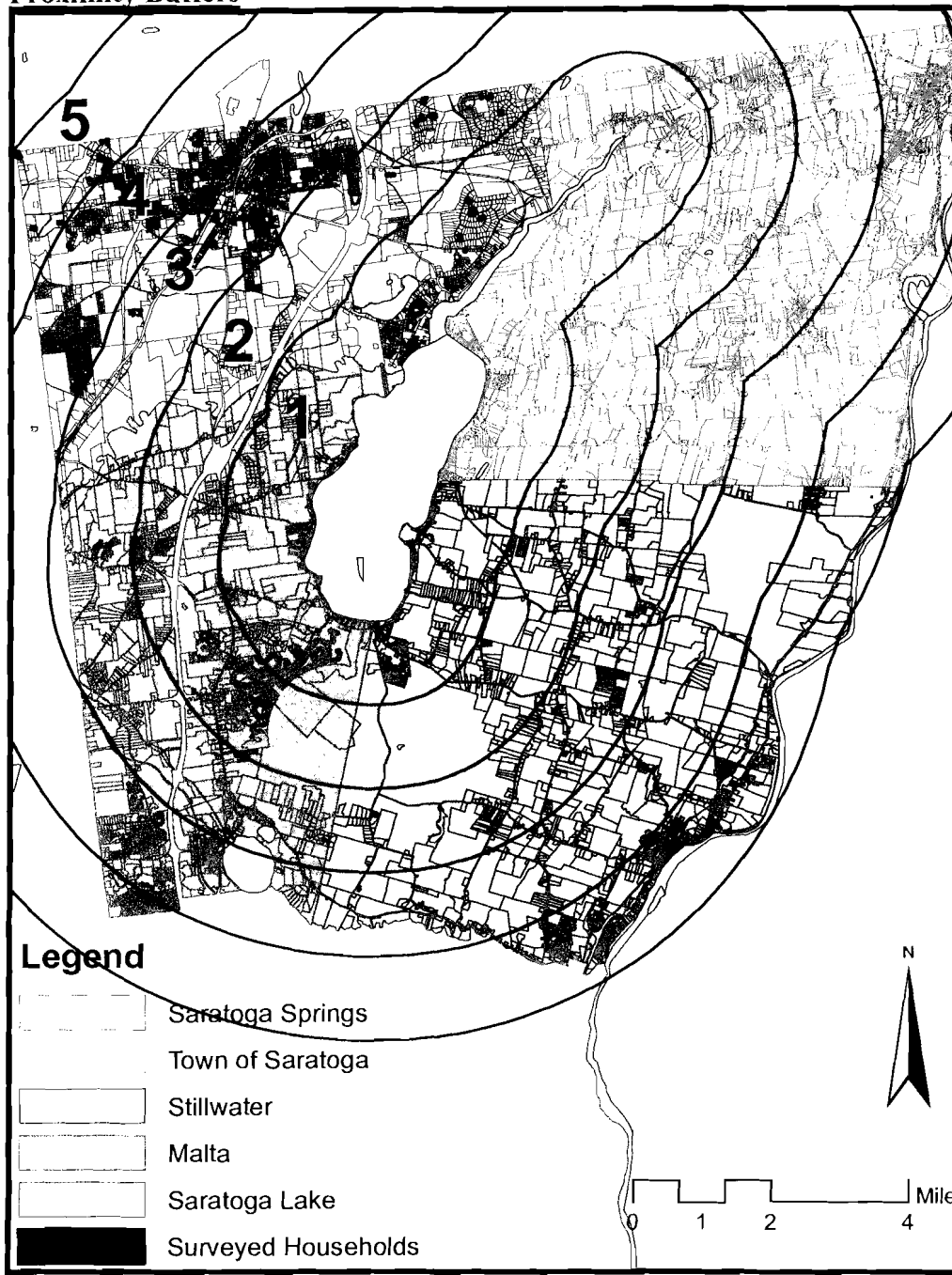


Figure 2: Survey

ID1. Do you use Saratoga Lake for recreation? ___yes(1) or ___no(2) ___NA(7)
 ___Don't Know(8) ___Refusal to Answer(9)

ID2. What year were you born? _____
 ___<18(1) ___19-25(2) ___26-45(3) ___46-64(4) ___>65(5)
 ___NA(7) ___Don't Know(8) ___Refusal to Answer(9)

(Answer assumed by interviewer)

ID3. What is your gender? ___Male(1) ___Female(2)

ID4. Which seasons do you use the Lake? ___Fall(1) ___Spring(2) ___Summer(3)
 ___Winter(4) ___NA(7) ___Don't Know(8) ___Refusal to
 Answer(9)

Now I am going to ask you a series of questions about your participation in different recreational activities on Saratoga Lake?

ID5. How often do you or a member of your household use the Saratoga Lake for....

	2+/Wk. (1)	Once/Wk (2)	Once/Mth (3)	Rarely(4)	NA(7)	DK(8)	Refusal(9)
Fishing(ID6)							
Ice Fishing (ID7)							
Motor Boating(ID8)							
Canoeing(ID9)							
Sailing(ID10)							
Swimming (ID11)							
Crew (ID12)							
ATV(ID13)							
Cross Country Skiing(ID14)							
Snowshoeing(ID15)							
Skating(ID16)							

ID17. What is the highest educational degree that you have earned?
 ___HighSchool(1) ___Undergraduate(2) ___Advanced(3) ___NA(7)
 ___Don't Know(8) ___Refusal to Answer(9)

ID18. What is your annual household income? Please tell me to stop when I have reached the bracket that best suites your household.

_____ <\$20,000 (1) _____ \$21,000-\$40,000 (2) _____ \$41,000-\$60,000 (3)
_____ \$61,000-\$80,000 (4) _____ \$81,000-\$100,000 (5) _____ Above \$100,000
(6) _____ NA(7) _____ Don't Know(8) _____ Refusal to Answer(9)

ID19. Did you vote in the last Saratoga Springs election? _____ yes(1) or _____ no(2)
_____ NA(7) _____ Don't Know(8) _____ Refusal to Answer(9)

ID20. Are you aware that the city of Saratoga Springs is considering using Saratoga Lake as a drinking water source? _____ yes(1) or _____ no(2)
_____ NA(7) _____ Don't Know(8) _____ Refusal to Answer(9)

ID21. Are you in favor of using Saratoga Lake? _____ yes(1) or _____ no(2)
_____ NA(7) _____ Don't Know(8) _____ Refusal to Answer(9)

ID22. Are you aware that the Saratoga County is considering using the Upper Hudson River as a drinking water source? _____ yes(1) or _____ no(2)
_____ NA(7) _____ Don't Know(8) _____ Refusal to Answer(9)

ID23. Are you in favor of this option? _____ yes(1) or _____ no(2)
_____ NA(7) _____ Don't Know(8) _____ Refusal to Answer(9)

ID24. Gear the qualitative question based on the interviewee's response to the previous Questions. Ex. Do you have any further comments? Could you please elaborate on how you formed your opinion on (blank)?

Appendix B

Table 1: Survey Response Rates

Buffer	Number of Respondents	Total Surveyed	Response Rate
1	12	65	40.00%
2	16	65	53.30%
3	11	65	36.60%
4	13	65	43.30%
5	13	65	43.30%

Table 2: Classification of Typical Respondent from Mean Statistics

Descriptive Statistics	
	Mean Statistic
Age	46-64
Buffer	3.000
Degree	Undergraduate
Income	\$81,000-Above\$100,000

Table 3: Standard Deviation and Standard Error Statistics

Descriptive Statistics		
		Std. Deviation
	Std. Error	Statistic
Age	0.111	0.874
Buffer	0.176	1.420
Degree	0.139	1.124
Gender	0.062	0.504
Recreation	0.062	0.503
SLfavor	0.348	2.809
UPHfavor	0.346	2.787
Income	0.233	1.644
Canoe	0.227	1.833
Crew	0.178	1.434
Fish	0.185	1.494
IceFish	0.119	0.961
MotorB	0.277	2.232
Sail	0.099	0.802
Fall	0.259	2.088
Summer	0.248	1.996
Spring	0.226	1.818
Winter	0.090	0.727
Skate	0.122	0.985
Snowshoe	0.115	0.923
Swim	0.304	2.455

Table 4: Crosstabulations and Statistical Significance

Crosstabulation: Buffer * Favor the Use of Saratoga Lake		
Chi-Square Tests		
	Value	Asymptotic Significance (2 sided)
Pearson Chi-Square	5.931	p=0.919
Likelihood Ratio	5.665	0.932
Linear-by-Linear Association	0.046	0.829
N of Valid Cases	65.000	

Crosstabulation: Buffer * Favor the Use of the Upper Hudson River		
Chi-Square Tests		
	Value	Asymptotic Significance (2 sided)
Pearson Chi-Square	2.323	p=0.969
Likelihood Ratio	2.378	0.967
Linear-by-Linear Association	0.008	0.930
N of Valid Cases	65.000	

Crosstabulation: Buffer * Income		
Chi-Square Tests		
	Value	Asymptotic Significance (2 sided)
Pearson Chi-Square	27.192	p=0.295
Likelihood Ratio	30.959	0.155
Linear-by-Linear Association	0.022	0.881
N of Valid Cases	50.000	

Crosstabulation: Buffer * Recreation Participation		
Chi-Square Tests		
	Value	Asymptotic Significance (2 sided)
Pearson Chi-Square	3.887	p=0.421
Likelihood Ratio	3.948	0.413
Linear-by-Linear Association	0.008	0.927
N of Valid Cases	65	

Crosstabulation: Recreation Participation * Saratoga Lake Favor		
Chi-Square Tests		
	Value	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.094	0.044
Likelihood Ratio	8.866	0.031
Linear-by-Linear Association	6.047	0.014

N of Valid Cases	65
-------------------------	----

Crosstabulation: Income * Saratoga Lake Favor		
Chi-Square Tests		
	Value	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.781	0.437
Likelihood Ratio	4.816	0.307
Linear-by-Linear Association	0.027	0.870
N of Valid Cases	49	

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Our Families

Survey Participants