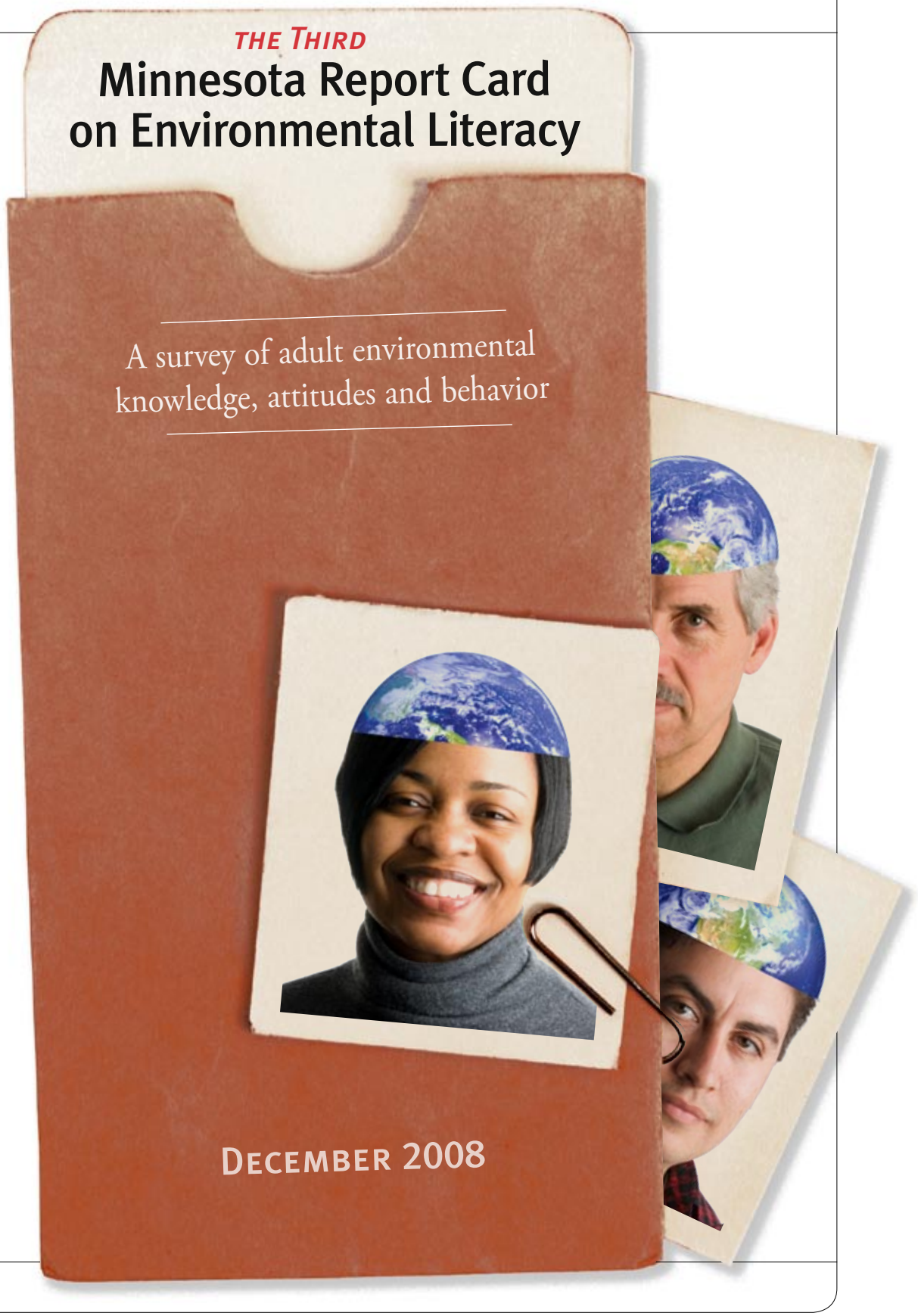
THE THIRD

Minnesota Report Card on Environmental Literacy

A survey of adult environmental knowledge, attitudes and behavior



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For additional information on this survey, check out the SEEK web site: **mnseek.net**

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Executive Summary

As Minnesotans, we continue to face and try to resolve various environmental issues, such as water quality, air quality, and climate change to name a few. What knowledge and skills do we need to be able to face and solve these issues? Minnesota needs an environmentally literate public—one that has knowledge about, and informed attitudes toward, the environment and the issues, which in turn may affect behaviors related to the environment. With this in mind, it is appropriate that we continue to collect information about the environmental literacy of Minnesota's residents.

The Third Minnesota Report Card on Environmental Literacy documents the results of the third statewide survey concerning environmental literacy of adults in Minnesota conducted in 2007. The first survey was completed in 2001. The second survey was completed in 2003. For all three report cards, Minnesota adults were surveyed for their knowledge about, attitudes toward, and behaviors related to the environment.

This report follows a similar format to the two previous *Minnesota Report Cards on Environmental Literacy (2002 and 2004)* describing the environmental literacy of Minnesotans. This report card compares Minnesotans' literacy on related survey questions to that of the previous Minnesota report cards, and surveys of other states' residents, and United States citizens. These comparisons are based on similar studies performed by other states and nationally.

Environmental knowledge

To collect data about environmental knowledge, adult Minnesota residents were asked two subsets of questions—general environmental knowledge and knowledge of energy. Some questions asked people to report what they think they know about various environmental topics. Other questions were multiple-choice questions with correct answers. These were used to determine what residents ***actually know*** about the environment.

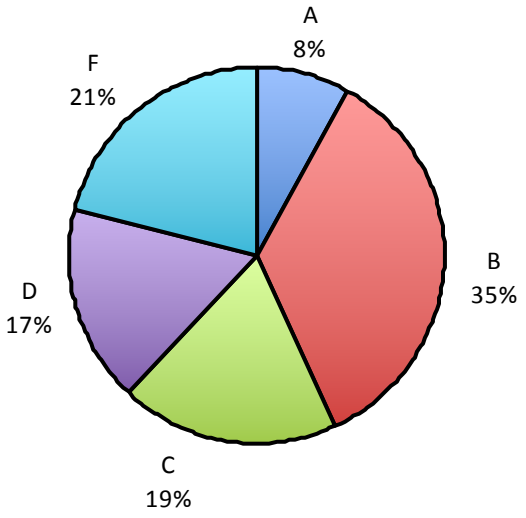
Approximately 40% of Minnesota adults *believe* that they are knowledgeable about environmental issues and problems; a similar number (43%) of the state's adults actually have an above-average knowledge about the environment, answering correctly five or more of the eight general knowledge environmental questions. In previous years, there was a larger discrepancy, in the opposite direction, between how much people reported they *knew and what they actually knew*. Interestingly on this 2007 survey, 44% of people reported they were knowledgeable about energy issues, but only 13% earned an A or B (five out of five correct or four out of five correct respectively) on energy knowledge. People may have a stronger sense of their general environmental knowledge than their knowledge about energy.

General environmental knowledge

Based on the eight general environmental knowledge questions, 62% of Minnesotan adults have at least an average or basic level of knowledge about the environment, which means that almost 38% of the state's adults have a below-average level of knowledge about the environment. A score of four or more correct answers is used as a measure of average or basic knowledge. In the previous report, 32% had a below average level of knowledge.

How did Minnesotans score? (Figure 1 in Part 1)

Based on the eight general environmental knowledge survey questions, here's how Minnesotans scored: (A = 7-8 correct; B = 5-6 correct; C = 4 correct; D = 3 correct; F = 0-2 correct). Over the past three surveys, the number of Minnesota residents who received an A score for the different sets of general environmental knowledge questions has varied from 8 to 11%.



For the first time, residents were asked where most of the "garbage" in Minnesota goes. Only 5% of residents correctly identified recycling centers while 73% incorrectly chose landfills. The high proportion of incorrect responses for this item suggests that there was confusion about the term "garbage." In some ways, the response is actually a very positive one in that people may view garbage as the material that remains after they have separated items for recycling. In other words, people have a strong concept about recyclable materials and they think those particular items should be treated differently. When scores for environmental knowledge were recalculated so that "landfills" was recoded as the correct answer for this waste question, 73% scored average or above (4 or more correct responses) and 27% of people scored below average (3 or fewer correct responses).

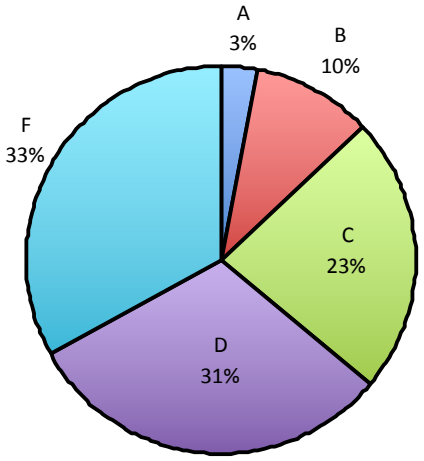
Knowledge of energy

Minnesotans were also asked a series of five questions to examine their knowledge of energy and related issues.

Thirty-six percent of Minnesota adults have at least an average or basic level of knowledge about energy (at least a grade of C, answering 3 or more questions correctly). Fully one-third (33%) earned a failing grade (0-1 questions correct) and 31% only answered two questions correctly. Compared to topics assessed in previous Minnesota surveys, it appears that the energy questions were more difficult for people to answer correctly. Interestingly, 44% of Minnesotans self-reported that they knew quite a bit about energy issues; however they did not seem to have a lot of energy knowledge.

Knowledge scores for Minnesotans about energy (Figure 8 in Part 1)

For this set of questions, the following grading system was developed: A = 5 correct; B = 4 correct; C = 3 correct; D = 2 correct; F = 0-1 correct.



Self-reported knowledge of specific environmental topics

Minnesota adults were asked how much they felt they knew about five environmental topics: environmental problems, air pollution, energy issues, water quality and global warming. Responses were on a five-point scale: 1 was "a lot," and 5 was "nothing at all."

For individual items, responses of 1 and 2 were combined into a "high" knowledge category, 3 was coded as "medium" knowledge, and 4 and 5 were combined into a "low" knowledge category. Overall, 42 to 44% of people indicated they knew quite a bit about each of the five topics. In order they are: energy issues (44%), global warming (44%), environmental problems (43%), air pollution (42%), and water quality (42%).

Attitudes toward the environment

In addition to what Minnesotans know about the environment, the survey also had questions designed to examine their attitudes toward the environment.

Laws and regulations

New items were added to this 2007 survey about Minnesotans' familiarity with laws and regulations. Both the familiarity and attitudinal items in this survey asked about laws and regulations concerning: air pollution, water pollution, chemicals in food, land development, energy conservation and energy efficiency, and global warming.

Overall, fewer than one-third of respondents indicated they were highly familiar with the laws and regulations related to the various issues: energy conservation and efficiency (31%), water pollution (29%), land development (28%), chemicals in food (26%), air pollution (25%), and global warming (23%).

Participants were then asked their attitudes toward the laws and regulations, specifically, if they had gone too far, not far enough, or struck about the right balance. For all topics, except land development, 59 to 66% of

Minnesotans reported they thought the laws and regulations have not gone far enough. For land development, 28% indicated they thought the laws and regulations have not gone far enough, 19% indicated they thought they have gone too far, and nearly half (47%) indicated they thought the right balance had been struck. Across all the items, fewer people reported they thought the laws and regulations have gone too far (3-19%) and 19-47% of people reported they thought the laws and regulations have struck about the right balance.

Attitudes toward energy needs

Respondents were asked to select from a list of four options, which they thought was the best way to address America's energy needs. Results showed that 67% of people thought developing renewable forms of energy would be the best way. The proportion of people who chose each of the remaining three options were roughly the same, and were much smaller: drilling for more oil and gas in the US (8%), expanding nuclear power capabilities (9%), and using coal more effectively (7%). Eight percent of people indicated they did not know.

Attitudes about choosing where to live

Participants were asked about the importance of six factors in deciding where to live. Overall, the factor that seems to be most important is personal safety: 90% of participants rated this as highly important. This is followed by quality of schools (72%); community spaces (67%), such as parks and natural areas; and property taxes (61%). The relatively less important factors are distance to work and living on a larger lot, although 48% and 44% respectively indicated this was highly important in their decision where to live.

Attitudes toward environmental education

Minnesota adults were again asked a question about whether environmental education should be provided in schools. The vast majority of Minnesotans (93%) wanted schools to provide environmental education. This number remains constant from the 2001 and 2003 Minnesota surveys. This support is not surprising given the interest of residents in providing quality education to the state's children, and is not significantly different from the *Pennsylvania Environmental Report Card, Nebraska Conservation and Environmental Literacy and Awareness Survey, Survey of Kentuckians' Environmental Knowledge, Attitudes and Behaviors,* and *National Environmental Report Cards* for 1996, 1997, and 2000.

Environmental behaviors

It is clear that a majority of Minnesotans (85%) reported that they frequently recycle items such as newspapers, cans, and glass. For a similar question in 2001, 80% of Minnesotans reported that they frequently recycle. A recent report from the Minnesota Pollution Control Agency states "Minnesota's recycling programs are among the nations most successful, reflecting the strong local and state investment and public participation" (*Report on 2006 SCORE Program*s, 2007, p. 3).

Three questions asked participants about their buying behaviors. One focused on electrical appliances and two centered on food. Regarding food purchases, 21% said they frequently buy organic food and 41% indicated they frequently purchase locally grown food. A similar question was asked in 2001. It is also encouraging that 41% of Minnesotans indicated that they frequently purchase locally grown food; in part because of the growing concern of "food miles"—the distance a food item travels from the farm to your home (http://www.sustainabletable.org/issues/buylocal/ retrieved on June 5, 2008). "In the U.S., the average grocery store's produce travels nearly 1,500 miles between the farm where it was grown and your refrigerator" (Pirog, Rich, and Andrew Benjamin. *Checking the Food Odometer: Comparing Food Miles for Local Versus Conventional Produce Sales in Iowa Institutions.* Leopold Center for Sustainable Agriculture, July 2003)

Participants were asked to report the number of hours per week they spent outside, not including time spent for their employment. Twelve percent of respondents spend fewer than five hours per week outside, 28% spend 5 to 10 hours per week outside, 31% spend 11 to 20 hours per week outside, and 27% spend 21 or more hours per week outside. It is interesting to note that 74 people (7.4%) indicated they spend more than 40 hours outside per week. Participants who reported spending more time outside also indicated they engaged in environmental behaviors more frequently and have higher levels of self-reported knowledge. They also had

higher scores on general environmental knowledge and higher scores on combined knowledge. Interestingly, there was no significant relationship between the amount of time spent outside and attitudes.

Demographic considerations

Survey data were analyzed based on a number of demographics. Males again scored higher than females in most of the responses to the general environmental knowledge questions, a finding consistent with other state and national surveys. Age, location, income, and education proved to be important factors in various areas of knowledge, attitudes, and behaviors.

Environmental literacy: Integrating knowledge, attitudes, and behavior

It is clear from the results of this and the 2001 and 2003 surveys that there are relationships between the environmental knowledge, attitudes, and behaviors of Minnesota residents. However, if a higher level of environmental behaviors is to be promoted, what factors are required to move citizens from a medium level to the high level of behavior? Is it the acquisition of knowledge or more affective (attitudinal) education or experiences that is required to promote more positive environmental behaviors? Whatever the case, Minnesota residents are willing to conduct environmentally friendly behaviors, but more research is required on the combinations of knowledge and attitudes in the creation of an environmentally literate population. Indeed, how does the information from these surveys and report cards relate to other research on environmental behaviors? These are important considerations when planning environmental educational programs. So, while the focus of environmental education may require some change, it does play an integral component in assuring an environmentally literate Minnesota and is an area that has strong support by the public.

Results from this survey show that self-reported knowledge is not perfectly related to the scores of the environmental and energy knowledge test. Seventy-one percent of those who earned an A on the environmental test (i.e., 11-13 items correct) reported they have high environmental knowledge. This percentage drops as the grade earned on the knowledge test drops, but it is interesting to note that 36% of people who earned a D and 28% of people who earned an F reported they have a high level of knowledge about the environment.

Minnesota Report Cards on Environmental Literacy

In this report card, the data from the 2007 survey are compared to data from the 2003 and the 2001 surveys. The first two surveys created a baseline understanding of environmental literacy for residents of the state. This survey continues this process with some new questions. It is important to continue conducting similar surveys in the future so that trends in environmental literacy can be tracked and well-informed decisions about education efforts can be made.

Introduction

As Minnesotans, we continue to face and try to resolve various environmental issues, such as water quality, air quality, and climate change to name a few. What knowledge and skills do we need to be able to face and solve these issues? Minnesota needs an environmentally literate public—one that has knowledge about, and positive attitudes toward, the environment and the issues, which in turn may affect behaviors related to the environment. With this in mind, it is appropriate that we continue to collect information about the environmental literacy of Minnesota's residents.

The Third Minnesota Report Card on Environmental Literacy documents the results of the third statewide survey conducted in 2007 concerning environmental literacy of adults in Minnesota. The first survey was completed in 2001. The second survey was completed in 2003. For all three report cards, Minnesota adults were surveyed for their knowledge about, attitudes toward, and behaviors related to the environment.

This report follows a similar format to the first two *Minnesota Report Cards on Environmental Literacy* describing the environmental literacy of Minnesotans. The first survey created a baseline of environmental literacy for residents of the state. The second report card and this survey continue this process with some new questions. It is important to conduct similar surveys in the future so that trends in environmental literacy can be tracked and any appropriate changes made in education efforts.

Comparisons are also made to residents from various states and United States citizens where applicable.

Survey instrument and methodology

The Minnesota environmental literacy survey was developed with members of the working group (see Acknowledgements page). The survey instrument includes questions from various *National Report Cards on Environmental Knowledge, Attitudes and Behaviors* (referred to as NEETF/Roper Starch reports in this document) conducted by the National Environmental Education Training Foundation and Roper Starch Worldwide, previous *Minnesota Report Cards on Environmental Literacy*, and the *Minnesota Climate Change Action Plan: A Framework for Climate Change Action*. Questions were also developed specifically for this survey. A copy of the entire survey is available in Appendix A. See Appendix B for the final frequencies of responses to each individual question.

Telephone numbers for the calling sample were purchased by Marketline Research, Inc. Interviewing began on August 24, 2007, and continued through November 6, 2007. Calls were made 9 a.m. to 9 p.m. Monday through Thursday, 9 a.m. to 7 p.m. Friday, and noon to 5 p.m. Saturdays and Sundays.

One thousand interviews were completed with adults throughout Minnesota. For a sample of this size, relative to the adult population of Minnesota (3,909,837 estimate by U.S. Census Bureau, 2006), the sampling error is plus or minus 3.1 percentage points for results with a 50/50 proportional split. That is, if response to a survey question resulted in 50 percent of the sample answering "yes" and 50 percent answering "no," it is very likely for a sampling of the entire population of Minnesota, the actual percentage of the population who give such answers would be somewhere between 46.9 and 53.1 percent. Sampling error is progressively smaller for results with uneven splits.

Data analysis

Data from the survey interviews were analyzed using descriptive and inferential statistics. These included frequencies of occurrence, Pearson Chi-Square test, Analysis of Variance, *t* tests and *z* tests of proportions. Variables measured in the survey included demographics (gender, age, education, location, income), knowledge, attitudes, and behaviors. In some sections of this report, some results are described as "statistically significant" even though the difference between them may seem small. A result is "statistically significant" when the differences between groups are great enough, or a pattern of results is strong enough, that we can conclude there is a meaningful difference or trend in the data, something that is not likely due to chance alone.

Demographics

The respondents to the survey were divided according to specific demographics to allow for analysis of the data (Questions 28-34). The demographics selected were gender, age (18 to 34, 35 to 44, 45 to 64, and 65 and older), education (high school, some college, college degree), location (seven-county metro, other metro areas in the state, non-metro or rural areas), and income ($15,000 or less, greater than $15,000 to $30,000, greater than $30,000 to $50,000, greater than $50,000 to $75,000, and greater than $75,000 to $100,000, and over $100,000). These demographics were also used in previous state and national report cards.

Organization and purpose of report

The report is divided into four parts. The first three discuss specific sections of the survey: knowledge, attitudes, and behaviors. The final section offers an integrated perspective to the overall report and to Minnesota adults' environmental literacy. For the first time, research on environmental literacy has been included in this fourth section.

It is important to remember that this survey and report are not an evaluation of the public, but rather a further collection of information concerning the knowledge about, attitudes toward, and behaviors related to the environment in Minnesota. This will be used with previous reports to track trends and changes in environmental literacy as Minnesota adults are surveyed again at various points in the future.

Part 1

Environmental Knowledge

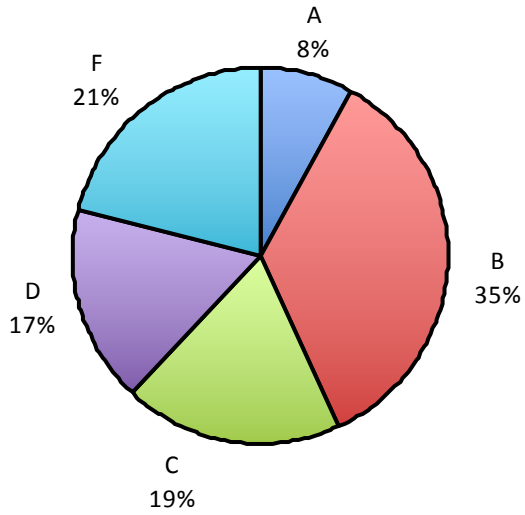
Adult Minnesota residents were asked two subsets of 13 fact-based questions—to determine what they *actually know* about the environment. Each of these questions had a correct answer. The first subset was an eight-question general knowledge test about the environment (Questions 9-16) and the remaining five questions were about the specific topic of energy (Questions 17-21). Previous report cards dealt with the specific topics of urban sprawl and water quality.

General environmental knowledge

Minnesotans were first asked eight general multiple-choice questions, dealing with topics such as air pollution, water pollution, global warming, wetlands, garbage, and reasons for animal extinction. Respondents had the option of selecting from four possible answers for each question, with only one being correct. They could also say that they did not know the answer. Figure 1 shows how Minnesotans scored on the general environmental knowledge portion of this survey. Future surveys will continue to track changes in the level of knowledge.

Figure 1. How did Minnesotans score?

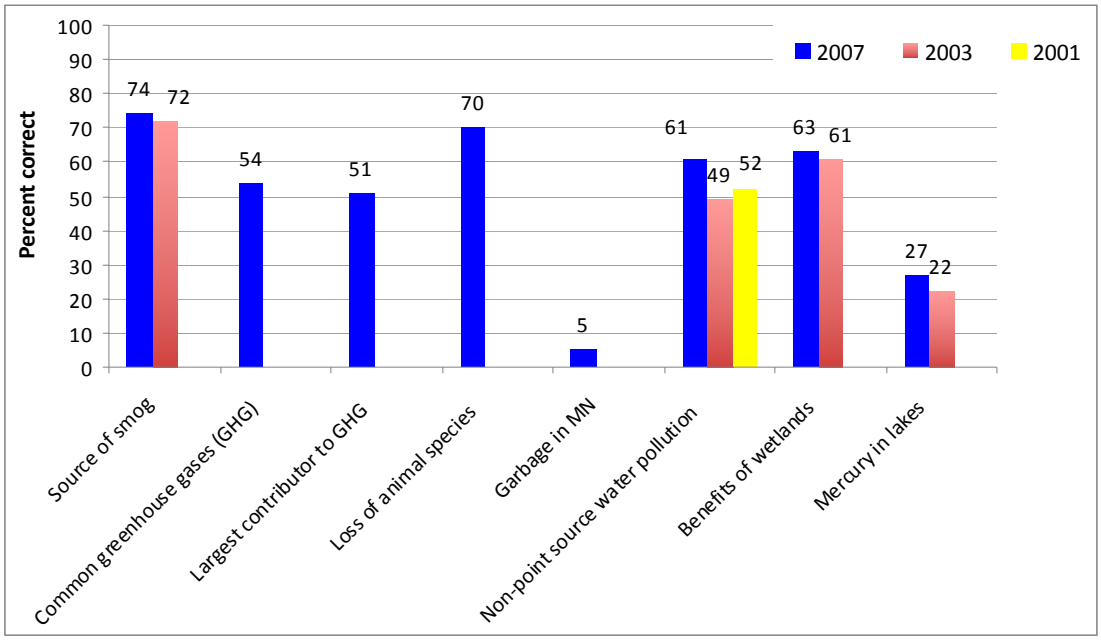
Based on the eight general environmental knowledge survey questions, here's how Minnesotans scored: (A = 7-8 correct; B = 5-6 correct; C = 4 correct; D = 3 correct; F = 0-2 correct). Over the past three surveys, the number of Minnesota residents who received an A score for the different sets of general environmental knowledge questions has varied from 8 to 11%.



Based on the general knowledge questions, 62% of Minnesota adults have at least an average or basic knowledge about the environment. A score of four or higher is used as a measure of average or basic knowledge (at least a grade of C). Note that only 8% of the state's adults have an excellent knowledge about the environment, answering seven or more questions correctly while 38% of the state's adults have a below-average knowledge about the environment (a grade of D or F, i.e., 3 or fewer correct responses). It should be noted that the question on garbage had a low number of correct responses and this issue is addressed further on the following pages.

The Third Minnesota Report Card on Environmental Literacy replicated a number of knowledge questions that were also used in the first and second Minnesota report cards, numerous NEETF/Roper report cards, and other state report cards. In the previous report cards, 55% (2002) and 68% (2004) had a basic knowledge about the environment (many of the questions used in this set of questions were different in each survey). Because the same set of general knowledge questions were not used, direct comparisons cannot be made at a group level. However, comparisons can certainly be made on individual questions. It is interesting to note that over the past three surveys, the number of Minnesota residents who receive an A score for the set of 8 questions has varied from 8% to 11%. Figure 2 shows the number of residents who correctly answered the eight general environmental knowledge questions and compares the individual questions used in a number of different surveys over time.

Figure 2. Percent correct on eight general environmental knowledge questions used in the Minnesota environmental surveys 2007, 2003 and 2001



As can be seen in Figure 2, more Minnesota residents answered the question on nonpoint source water pollution correctly than in the previous surveys and the number answering the question correctly has increased from 52% in 2001 to 61% in this current survey, a statistically significant increase. For three other questions covered in two surveys, 2003 and 2007, the increase in Minnesota residents answering the questions correctly for two of the questions is not significant—the source of smog and the benefits of wetlands. For the other question, mercury in lakes, significantly more people answered correctly in 2007 than in 2003.

Questions that were used in this survey for the first time yielded interesting results: 54% of Minnesota residents correctly identified carbon dioxide as a common greenhouse gas and 51% answered correctly that burning fossil fuels is the largest contributor to greenhouse gas emissions in Minnesota. The latter question was used in another survey conducted in 2002 by the Minnesota Pollution Control Agency and the Office of Environmental Assistance. This climate change survey, a part of the *Minnesota Climate Change Action Plan: A Framework for Climate Change Action* (published in 2003), focused on state agency personnel as its target audience. Eighty-six percent of state agency personnel answered the question concerning the largest contributor to greenhouse gas emissions correctly; 51% of the general public answered the question correctly in this 2007 survey. According to a 2008 *Minnesota Climate Change Advisory Group Final Report*, almost 80% of human-caused greenhouse gas emissions in Minnesota comes from the burning of fossil fuels. In addition, Minnesota's greenhouse emissions are rising faster than those of the nation as a whole, increasing by about 32% from 1990 to 2005 (*Final Minnesota Greenhouse Gas Inventory and Reference Case Projections,* 1990-2025).

For the first time, residents were asked where most of the garbage in Minnesota goes. Only 5% (52 of the 1,000 respondents) correctly chose recycling centers while 73% incorrectly chose landfills. The high proportion of incorrect responses for this item suggests that there was confusion about the term "garbage." In some ways, the response is actually a very positive one in that people may view garbage as the material that remains after they have separated items for recycling. In other words, people have a strong concept about recyclable materials and they don't consider those particular items to be "garbage." More of the leftover material, probably termed garbage in common vernacular, does in fact go to landfills. Technically though, garbage is a part of mixed municipal solid waste (MSW) which is defined by Minnesota state statute as "garbage, refuse, and other solid waste from residential, commercial, industrial, and community activities that

the generator of the waste aggregates for collection. MSW *does* include wastes recycled, discarded (including tons sent to disposal and resource recovery facilities), tons disposed of on-site (burn barrels or farm dumps), and problem materials not recycled" (*Report on 2006 SCORE Programs,* 2007, p. 1). Figures 3a and 3b show the results for the disposal of garbage in Minnesota and the destination of materials after items have been separated for recycling.

Given the difficulties with this particular survey question about waste, two additional analyses were conducted. First, when the waste question is removed from the general environmental knowledge scores, it has virtually no impact on the distribution of environmental knowledge scores. Based on this finding, a further analysis was conducted. When scores for environmental knowledge were recalculated so that "landfills" was recoded as the correct answer for this waste question, 73% scored average or above (4 or more correct responses) and 27% of people scored below average (3 or fewer correct responses). The biggest difference was that 22% would have earned a grade of A under this type of recoding. The proportion of those earning a B remained roughly the same at 34 to 35%.

Figure 3a. Disposal methods for garbage as defined by Minnesota state statute**

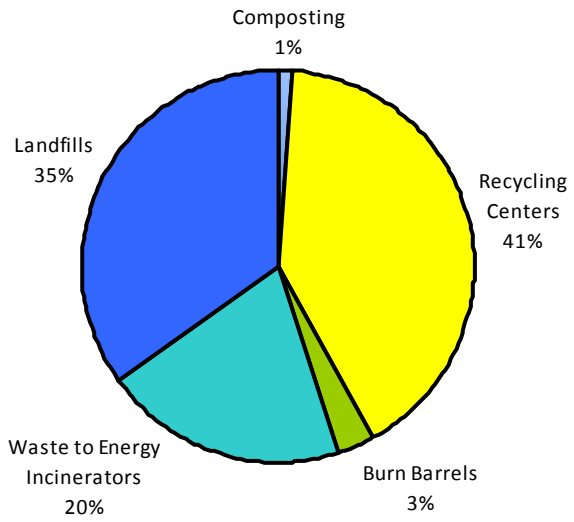
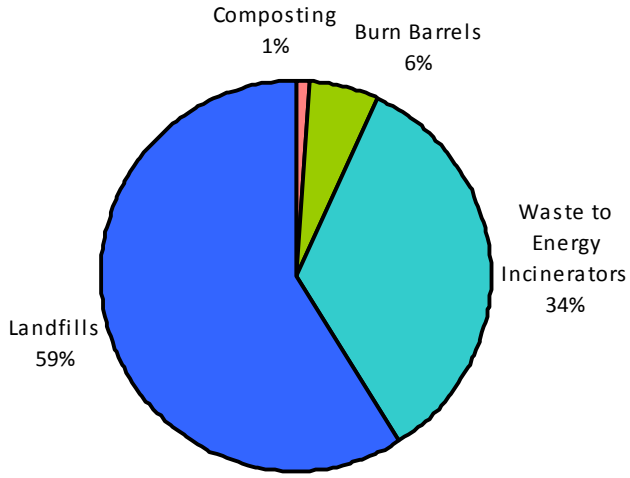


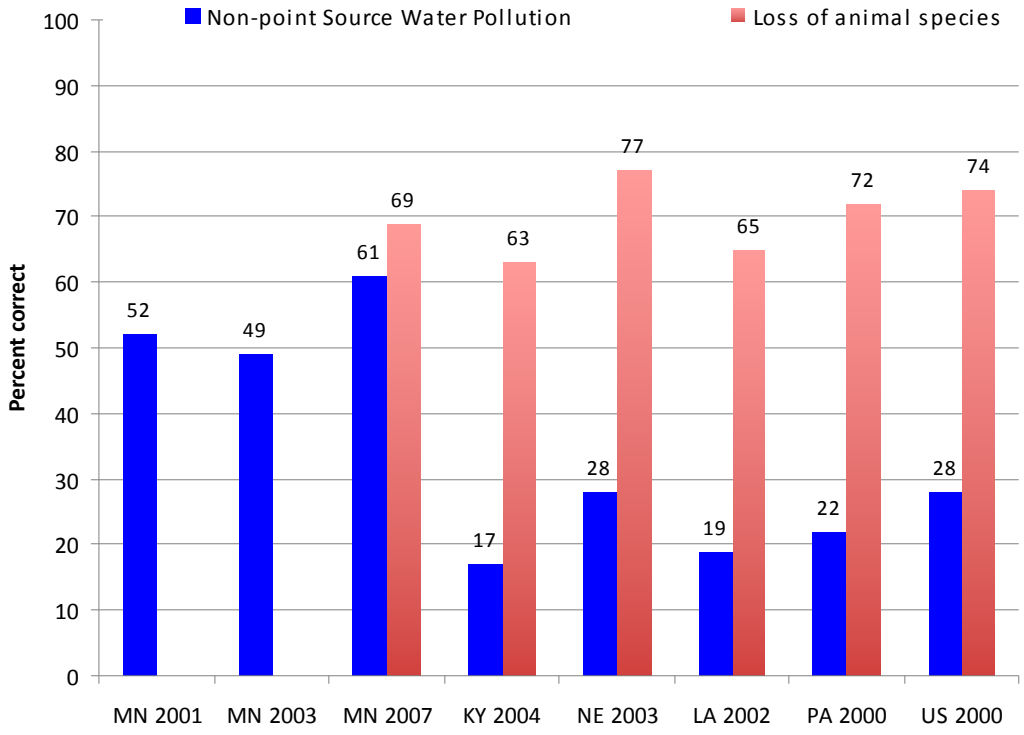
Figure 3b. Disposal methods for garbage after recycling is taken out



** Composting was not an option in the question.*
*** Minnesota Pollution Control Agency SCORE Program for 2006*

Even with all the success the state has had with recycling, the rate has not significantly changed in 10 years and disposing of materials in landfills is the dominant disposal method (see Part 3 of this report for additional information on this topic). So, in this sense many of the respondents answered correctly, assuming that they used a different concept for garbage.

Figure 4. Comparison of scores on two environmental knowledge questions used in national, state, and Minnesota Report Cards on Environmental Literacy



A question regarding the main cause of water pollution that is consistently used in the Minnesota report cards and other state and national surveys indicates that Minnesota residents are more knowledgeable about this topic than residents of Kentucky, Nebraska, Louisiana, Pennsylvania, and the nation as a whole. Minnesota residents even in 2001 were more likely to answer this question correctly than residents from a national sample or other listed states. The results of the second question, regarding the most common reason for animals becoming extinct, show that Minnesota residents scored lower than residents of Nebraska, Pennsylvania, and the U.S., but higher than those who live in Kentucky and Louisiana.

Demographics

Gender. There were significant gender differences on all but two of the general environmental knowledge items: the item on animal extinction and the item on garbage (Figure 5). For all items, except for the items on animal extinction (loss of animal species) and garbage, greater proportions of males chose the correct answer compared to females. Overall, males had a significantly higher mean score for the composite of the eight items (Figure 6).

Fifty-three percent of females correctly answered that the most common cause of pollution to streams, rivers, and oceans is surface water running off yards, city streets, paved lots, and farm fields, while 72% of males correctly answered that question. Twelve percent of females and 12% of males incorrectly chose that the most common cause was waste from factories.

Residents were asked what they thought was the primary source of smog in the Twin Cities and 69% of females and 81% of males correctly answered that the primary source was exhaust of motor vehicles.

When asked what the largest source of mercury in Minnesota's air was, 18% of females and 40% of males correctly indicated the source is coal-burning power plants. Twenty percent of females and 14% of males

indicated exhaust from motor vehicles, and 13% of females and 12% of males indicated burning of batteries in incinerators.

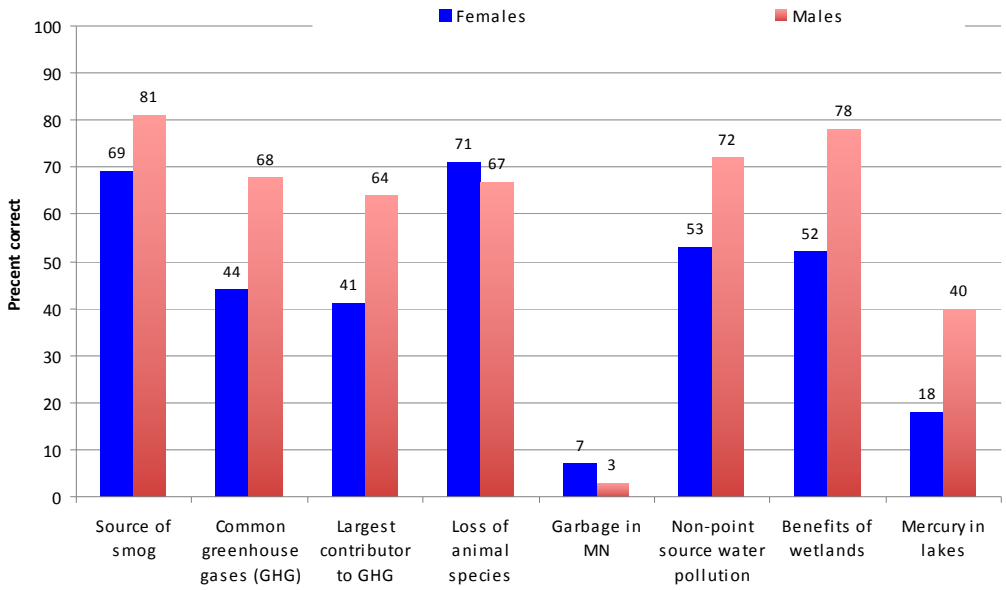
Residents were asked to select a common greenhouse gas from a list. Forty-four percent of females and 68% of males correctly chose carbon dioxide. Ten percent of females and 11% of males chose sulfur-dioxide, an incorrect answer.

Residents were asked to select from a list, the largest contributor to greenhouse gas emissions in Minnesota. Forty-one percent of females and 64% of males chose burning fossil fuels (coal, oil, gasoline, diesel, and natural gas), which was the correct answer. Interestingly, 12% of females and 5% of males incorrectly chose gases released from landfills.

When asked what the most common reason is that an animal species becomes extinct, 71% of females and 67% of males correctly indicated that their habitats are being destroyed by humans. There was no significant gender difference on this item.

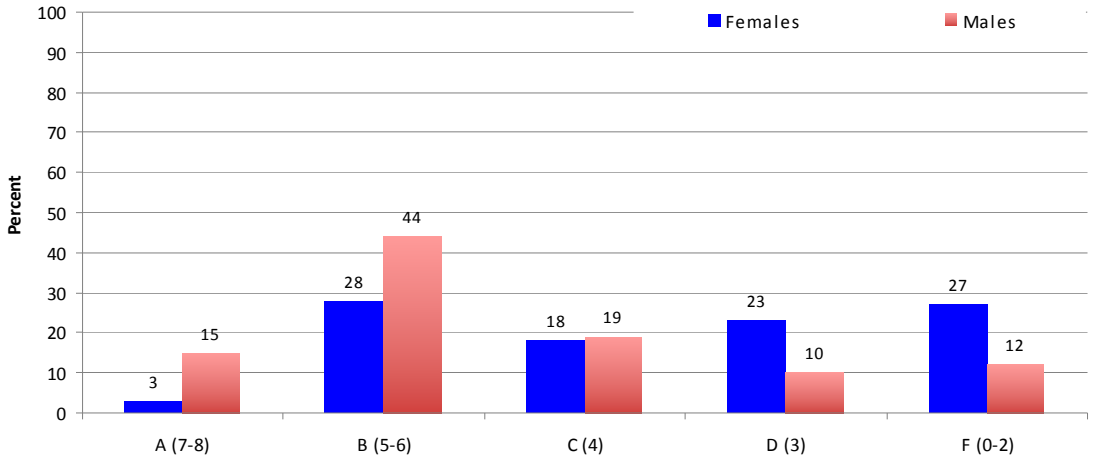
Fifty-two percent of females and 78% of males correctly answered that one of the main benefits of wetlands is to help filter and store water before it enters lakes, streams, rivers, or oceans.

Figure 5. Correct responses of Minnesota females and males to eight general environmental knowledge questions



Finally, for the general knowledge questions, residents were asked where most of the garbage in Minnesota goes. Only 7% of females and 3% of males correctly identified recycling centers while 67% of females and 80% of males incorrectly chose landfills. There was no significant gender difference for the correct answer on this item.

Figure 6. Comparison of composite scores of general environmental knowledge of Minnesota females and males



(A=7 or 8 of the 8 items correct, B=5 or 6 correct, C=4 correct, D=3 correct, and F=0-2 correct)

For the set of eight general environmental questions, 49% of females have an average or basic knowledge about the environment (grades of A, B, or C) compared to 78% of males (Figure 6). This is a very large and statistically significant knowledge gap, but is consistent with previous National Environmental Report Cards (1997-2001) and state surveys (Minnesota, Pennsylvania, Louisiana, Kentucky).

Age. When comparing the mean scores on the general environmental knowledge section, residents aged 45 to 64 had the highest composite score for these items and their average score was significantly higher than the average score of those 18 to 34 and those 65 and older. While the average score for 45 to 64 year olds was higher than the average score for 35 to 44 year olds, there was not a significant difference between these two age groups. Figure 7 shows the results for the age categories that have been used in the previous Minnesota report cards. Two of the age categories that spanned a large age range (18-34 and 45-64) were subdivided for further analysis in this report. The analysis showed that there were no significant differences between 18 to 24 year olds and 25 to 34 year olds. Likewise, there were no significant differences between 45 to 54 year olds and 55 to 64 year olds.

Approximately 24% or higher of all age groups correctly answered at least five of eight questions (receiving a grade of A or B) (24% of those ages 18-24, 32% ages 25-34, 44% ages 35-44, 49% ages 45-54, 51% ages 55-64 and 37% 65 and older).

None of the respondents ages 18 to 24 received an A grade (7-8 questions answered correctly), compared to 6% ages 25 to 34, 8% 35 to 44 years old, 10% ages 45 to 54, 12% 55 to 64 years old, and 5% of the 65 and older group. In addition, 17 to 21% of each group received a C grade (4 questions answered correctly).

Fifty-five percent of those between the ages of 18 to 24 earned a D or F for the general environmental knowledge test by getting 3 or fewer items correct. The two age groups who had the highest proportion of people earning a D or F were those ages 18 to 24 (55%) and 25 to 34 (47%). In each of the other age groups, 31 to 43% earned a D or F.

It is not surprising that more mature residents, those aged 45 to 54 and 55 to 64 are more environmentally knowledgeable, earning a B or higher by getting 5 or more items correct, 51% and 49% respectively, compared to 44% for ages 35 to 44, 37% for 65 or older, 32% for ages 25 to 34, and 24% for 18 to 24 year olds. One possible explanation is that they were 5 to 24 years old when the modern environmental movement flourished with the foundation of Earth Day in the 1970s, creating a new awareness about the need to preserve and maintain the environment. It was also during the late sixties and early seventies that environmental legislation, policy, and education was enacted both nationally and at the state level. Since then, environmental legislation,

policy, and education have continued to be important issues in society with some environmental success (i.e. removal of some species such as the Bald Eagle from the Endangered Species List) and the younger residents (ages 18-34 and 35-44) have been exposed to these issues. However, it is clear that the younger age groups do not score as well on the eight general environmental questions.

Figure 7. Comparison of scores of Minnesota residents on general environmental knowledge questions based on age, education and income level

	Age				Education			Income			
	18-34	35-44	45-64	65+	HS or less	Some college	College degree	$30K or less	Greater than $30 to $50K	Greater than $50K to $75K	Greater than $75K
A	5%	8%	11%	5%	2%	5%	14%	4%	3%	10%	14%
B	25%	36%	39%	32%	26%	34%	42%	23%	35%	39%	42%
C	21%	20%	17%	20%	20%	19%	18%	18%	22%	16%	19%
D	23%	17%	16%	17%	22%	19%	13%	23%	17%	16%	15%
F	26%	20%	17%	26%	31%	22%	14%	33%	23%	20%	11%

Education. There were significant mean differences between the three education groups (high school or less, some college, college degree). Those with more formal education had higher means on the general environmental knowledge section. Fourteen percent of those with a college degree or above received an A grade (13% in 2003, 15% in 2001), compared to 5% and 2% for those with some college education and high school or less respectively (Figure 7). In 2003, 6% with some college education and 3% high school or less received an A; in 2001, 8% with some college education and 4% of high school or less these respective groups received an A grade. It should again be noted that the questions were not the same in both surveys. A similar pattern exists for the B grade: 42% with a college degree, 34% with some college, and 26% with high school degree or less. Of those with a college degree, 14% got a failing grade (F), compared to 22% for those with some college education and 31% with high school or less. It is also interesting to note that this demographic has been significant across all three surveys.

Income. Respondents with a higher income answered significantly more questions correctly than those with relatively lower incomes. Twenty-seven percent of those with income less than $30,000 received an A or B, 38% of those with income $30,000 to 50,000, 49% of those with income $50,000 to 75,000, and 56% of those with income greater than $75,000 (Figure 7). On the other end of the grading scale, 33%, 23%, 20%, and 11% of the respective income groups earned an F. Those earning less than $30,000 had significantly fewer B grades than the other income groups. Those earning more than $75,000 had significantly fewer D grades than those earning less than $30,000. Finally, those earning less than $30,000 had significantly more Fs than those in other income groups while those earning more than $75,000 had significantly fewer Fs than those in the other income groups.

Location. Unlike previous years, it appears that location is related to scores on the general environmental knowledge section. The results from people living in the seven-county metro area (Hennepin, Ramsey, Anoka, Washington, Dakota, Scott, and Carver) and other metro areas (Stearns, St. Louis, Olmsted) show significantly higher mean scores for the composite of these items than for those living in non-metro areas.

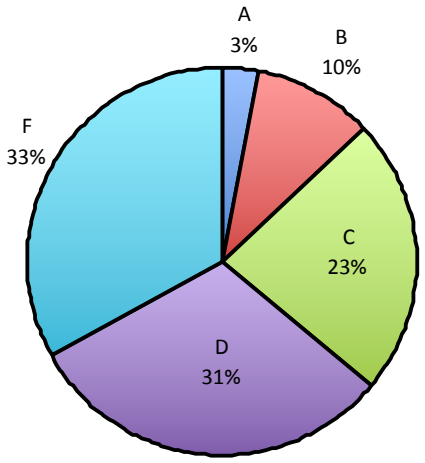
An additional analysis was conducted to explore whether people living in metro areas scored differently on the knowledge item about the primary source of smog, compared to those living in a sample of non-metro counties. The metro counties included: Hennepin, Ramsey, Anoka, Washington, Dakota, Scott, and Carver. The sample of non-metro counties used included: Kittson, Marshall, Pipestone, Rock, St. Louis, Lake, Koochiching, Itasca, Lake of the Woods, Belltrami, Rosseau, Cass, and Polk. Results showed that 74.3% (N=349 out of 470) of those living in metro counties correctly answered the question, as did 73.8% (N=76 out of 103) of those living in the sample of non-metro counties, yielding no statistically significant difference.

Knowledge of energy

In a second subset of five environmental knowledge questions (Questions 17-21), Minnesotans were asked questions designed to measure their knowledge about energy. Energy is an important issue facing the state and the nation. With the demand for energy growing in the coming decades, residents should have knowledge of their sources of energy as well as the impacts of those sources on health, the environment, and the economy. Given all the media coverage about energy issues and climate change in general over the time period of this survey, Minnesotans did not score very well on this set of questions. Figure 8 shows how Minnesota residents scored overall on the five questions.

Figure 8. Distribution of knowledge scores for Minnesotans about energy

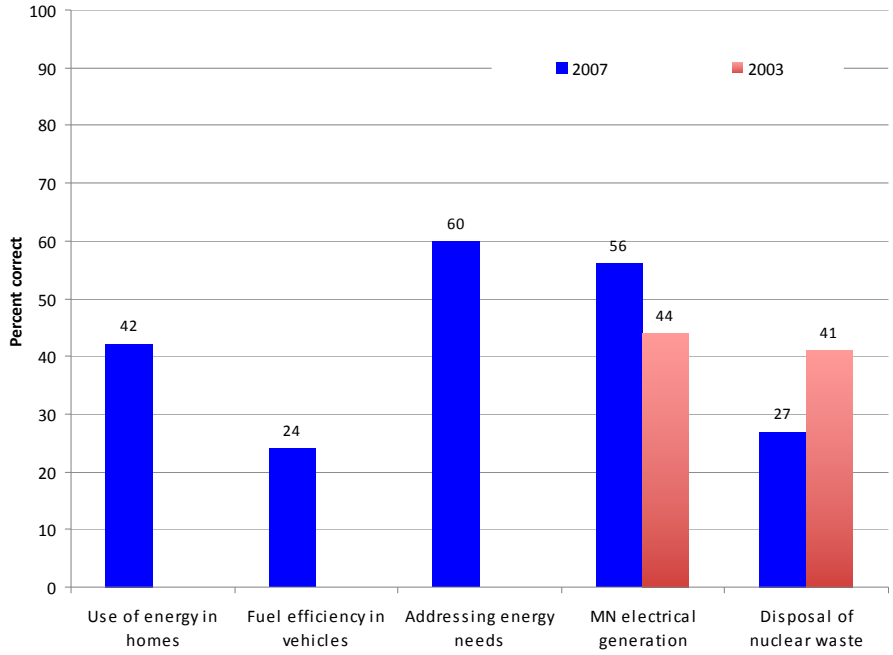
For this set of questions, the following grading system was developed: A = 5 correct; B = 4 correct; C = 3 correct; D = 2 correct; F = 0-1 correct.



Thirty-six percent of Minnesota adults have at least an average or basic level of knowledge about energy (at least a grade of C, answering three or more questions correctly). Fully one-third (33%) earned a failing grade (0-1 questions correct) and 31% only answered two questions correctly. Compared to topics assessed in previous Minnesota surveys, it appears that the energy questions were more difficult for people to correctly answer.

In the 2001 NEETF/Roper energy survey, Americans had a poorer performance than on previous national surveys. Only 12% of Americans had a passing understanding (received an A. B, or C) of basic energy information while over 30% had a passing understanding of general environmental issues. This lower level of performance on energy issues as compared to general environmental issues may be surprising to those who lived through the oil embargoes and energy shortages of the 1970s. One might think that after the energy crisis of the 1970s, Americans would be more knowledgeable about energy; however, 30 years later this clearly was not the case. So, it is apparent, that Americans have much to learn about the basics of energy production, consumption, and conservation (NEETF/Roper Report, 2002). And while energy was somewhat on the general public's radar in 2001, six years later, energy has become a very important issue with record costs for oil and its impact on food prices. Using the grade criteria from the NEETF/Roper survey, 36% of Minnesotans seem to have a passing understanding of energy issues, however all residents could show improvement on this measure. Figure 9 shows the responses of Minnesota residents to the five energy questions asked in this survey.

Figure 9. Percentage of respondents who selected the correct answer on five energy knowledge questions



Forty-two percent of residents answered correctly that heating rooms uses the most energy in people's homes in Minnesota, while 19% believed the answer was cooling rooms and 21% responded they did not know the answer. According to *Xcel Energy Smart Guide; Guide to Home Energy Savings* (2005), heating and cooling is responsible for 58% of residential energy usage with heating using the most energy, followed by water heating (19%), refrigeration (12%), and lighting and appliances (11%).

Participants were then asked what has happened to fuel efficiency of vehicles in the U.S. in the past 10 years, 24% correctly answered that it has remained the same. Almost half of the participants (49%) incorrectly responded that fuel efficiency has increased. About 10% responded they did not know the answer. In 1975 during rising oil prices, Congress set in place "corporate average fuel economy" (CAFE) standards for new passenger cars. Light trucks were included later. The fuel efficiency standards for vehicles rose and fell but finally settled at 27.5 mpg in 1990. President George W. Bush signed an energy bill, the Energy Independence and Security Act of 2007, which requires auto companies to achieve a 35 mpg fuel efficiency standard by 2020 (http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.43ac99aefa80569eea57529cdba046a0/). The results for this question are interesting considering that the increase in fuel efficiency and mileage standards were debated considerably by Congress, featured in the media, and signed into law by the president while the survey was being conducted.

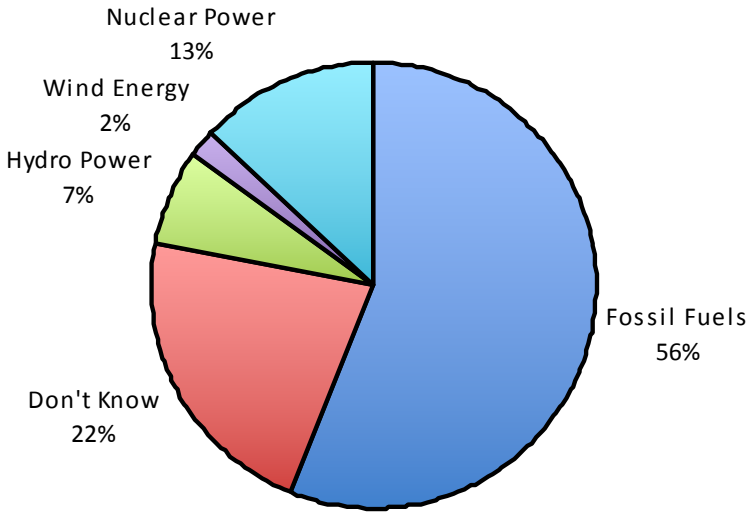
An interesting note in relation to mileage is seen in the most recent report from the U.S. Department of Transportation Federal Highway Administration (March 2008), which reports that travel on all roads and streets in the nation is down by 4.3% over the previous year. In Minnesota, the change is 1.5%, from 4,506 million miles to 4,436 million miles. Federal authorities believe that the high cost of gasoline is primarily responsible for the decrease in driving.

The third question asked what participants thought that energy experts say is the fastest and most cost-effective way to address our overall energy needs. The majority (60%) correctly chose that people become more energy efficient in their uses, while 13% responded they did not know the answer. Nine percent suggested developing all possible domestic sources of oil and gas, while 11% and 5% respectively answered that more nuclear power plants or hydroelectric power plants should be built. A similar question in the 2001 NEEFT/Roper national survey yielded the following results: 16% answered that all possible domestic sources of oil and gas should be developed; 14% and 13% respectively answered that more nuclear power plants or hydroelectric power plants should be built, while 39% answered that more energy conservation should be promoted. In relation to

conservation of energy and energy efficiency, much has changed in the last seven years and perhaps the public has become more knowledgeable and educated about this issue.

As Figure 10 shows 56% of participants correctly responded that fossil fuels are used to generate most of the electricity used in Minnesota, while 13% incorrectly chose nuclear power and 22% indicated they did not know the answer. Significantly more residents answered this question correctly in this survey when compared with the 2003 survey. Energy issues were featured in the media a lot over the period of this survey, which may have contributed to this increase.

Figure 10. Responses of Minnesotans to question about electricity generation in Minnesota



Finally, participants were asked what we do with nuclear waste now in Minnesota. Twenty-seven percent of participants correctly responded that it is monitored at the nuclear power plant, while 27% incorrectly responded that it is sent to another state for storage. Fully 38% of people responded they did not know the correct answer. The results for this item should be interpreted with some caution; in 2003, 41% of respondents correctly answered a similar question. A slight change was made in the correct answer for the question used in this survey. It was written as "monitor it [nuclear waste] at the nuclear power plant" and more people may have chosen the correct answer if it read "store and monitor it at the nuclear power plant" as used in the previous survey.

Knowledge of electrical generation

Consumption of all forms of energy is predicted to increase nationwide by almost 20% over the next two decades (Annual Energy Outlook 2008, http://www.eia.doe.gov/oiaf/aeo/consumption.html). Over this time period, national electricity consumption is predicted to increase from 3,814 billion kilowatt hours in 2006 to 4,972 billion kilowatt hours in 2030. Globally, consumption of energy is projected to increase by 57% from 2004 to 2030 (http://www.eia.doe.gov/oiaf/ieo/world.html. If this holds true, then world electricity generation needs will double from 2004 to 2030 (http://www.eia.doe.gov/oiaf/ieo/electricity.html).) It is imperative then that residents know how their electricity is generated and how some of its by-products are disposed of.

In this survey, as in the 2003 survey, a question specifically addressing electricity generation in Minnesota was included (Figure 10). The answer options given for this question were altered slightly between the two surveys. The wording of the original 2003 question, which was based on a NEETF/Roper Starch question, had been used in two slightly different forms in the 2003 survey. The first was the original question; the second was altered to ask about electricity generation specifically for Minnesota, and the option of wind energy was substituted for solar power. However, there was still some concern about the wording of the answer options and so in this survey the options were revised to be more similar in wording (see changes in Figure 11).

Figure 11. Comparison of correct responses on question about electricity generation in Minnesota in 2001

How is most of the electricity used in MN generated? Is it…	MN (2003)	MN (2007)	Actual % of generation in Minnesota (2006)
With fossil fuels *(by burning fossil fuels such as coal, oil)	44%	56%	68%** (coal 62%, gas 5%, petroleum 1%)
With nuclear power *(energy)*	19%	13%	25%**
With *(through)* wind energy	1%	2%	<1.5%***
With hydro power *(at hydroelectric power plants)#	21%	7%	1%**
Don't know	14%	22%	

**Used in 2003 version of this question.*
***Minnesota electricity generation for other sources (including renewables such as solar, cogeneration, etc.) is 4% from U.S. Department of Energy web site, http://www.eia.doe.gov/cneaf/electricity/st_profiles/sep2006.pdf, p. 118.*
**** (http://www.state.mn.us/mn/externalDocs/Commerce/Harvesting_the_Wind_110702042324_RENUWIND.PDF)*
#There are approximately 32 dams in Minnesota that contribute power to the electricity grid.

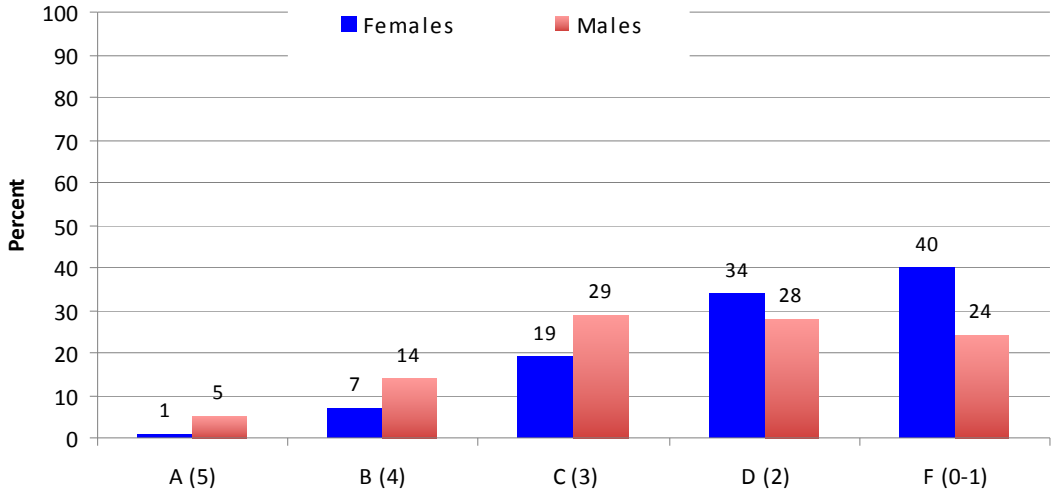
Fifty-six percent of respondents answered this question correctly, a large and significant increase over the previous survey, while 54% of residents also correctly identified carbon dioxide as a common greenhouse gas. Interestingly, this question produced the lowest number of respondents incorrectly selecting hydro-power plants as the answer (7%), compared to the previous surveys (32% in 2001, 22% in 2003). This may have been influenced by the word changes in the answer options.

Nuclear power: Minnesota has three nuclear power units (one at Monticello and two at Prairie Island), which generate 25% of the state's electrical needs. Nuclear waste is a by-product of this generation process. Over the last five decades, construction, political, and scientific discussions as well as legal battles have all occurred about creating a national nuclear waste repository at Yucca Mountain, Nevada. However, until the situation is clarified, nuclear waste is currently stored and monitored on site at the nuclear power plants where it is generated. In Minnesota, the storage and monitoring of this waste has occurred since the 1970s and will continue to be stored here until the Yucca Mountain repository is completed (www.leg.state.mn.us/LRL/Issues/prairieIsland.asp). In the survey, participants were asked what is done with nuclear waste now in Minnesota (Question 21). Twenty-seven percent of residents answered correctly that it is monitored at the nuclear power plant; while 27% answered that it is sent to another state for storage. Compared to the 2003 report, the number of people who chose the correct answer was lower by about 14%. This may be due to the wording of the correct response option. In past reports, the correct response included the words "stored and monitored" while the correct response option for 2007 included just the word "monitored." Thirty-eight percent of residents reported they did not know what was done with nuclear waste in Minnesota. This question is slightly different than a similar question used in the 2000 and 2001 NEETF/Roper Starch National Report Cards, where 12% and 18% of Americans believed that nuclear waste is disposed of in landfills, while respectively 57% and 47% believe that the waste is stored and monitored. At the national level, respectively 21% and 24% did not know what was done with nuclear waste.

Demographics

Gender. There was a significant gender difference on the energy knowledge section. Males had a significantly higher mean score for the composite of these items than did females. Forty-eight percent of males received an A, B, or C compared to 27% of females. Figure 12 compares the scores for females and males on this set of questions. Forty percent of females received a failing grade (0-1 questions correct) for this set of questions.

Figure 12. Comparison of responses of Minnesota females and males on overall energy knowledge by grade



Age. Age is not as clearly related to results on the energy knowledge section as it is on the general environmental knowledge section. When using four age categories: 18 to 34, 35 to 44, 45 to 64, and 65 and older, there were no significant differences between age groups. When using more age categories, those who were ages 55 to 64 had a significantly higher mean score on the composite of these items compared to those who were 35 to 44 years old and those who were 65 and older. Those who were ages 18 to 24 had the lowest average score for this section but there were too few people 18 to 24 (N=29) to test the mean of that group.

Education. As with the general environmental knowledge section, the level of formal education is related to the number of correct responses given to the energy knowledge questions in this survey. Those with a college degree (bachelor's degree or above) scored significantly higher than those with either some college or a high school education or less. Forty-nine percent of those with a college degree or more received an A, B, or C grade, compared to 29% for those with some college education and 24% high school or less, respectively (see Figure 13).

Income. Overall, those with higher incomes had significantly higher scores on the energy knowledge section. Those who made less than $30,000 had a significantly lower mean score on the energy knowledge section than each of the other three income groups. Likewise, those who made $30,000 to 50,000 had a significantly higher mean score than those who made less than $30,000, and a significantly lower mean score than the other two income groups. There was no significant difference between those whose income was $50,000 to 75,000 and those whose income was more than $75,000. Further analyses reveal that those who made $15,000 or less had an even lower mean, which was significantly lower than any other income group.

Figure 13. Comparison of responses of Minnesota residents on five energy knowledge questions based on age, education, and income level

	Age				Education			Income			
	18-34	35-44	45-64	65+	HS or less	Some college	College degree	Less than $30K	$30K-$50K	$50K-$75K	More than $75K
A	2%	1%	4%	3%	2%	2%	4%	1%	3%	4%	4%
B	11%	10%	10%	9%	8%	7%	14%	3%	10%	11%	13%
C	19%	23%	26%	20%	14%	20%	31%	20%	15%	27%	26%
D	31%	28%	33%	32%	33%	32%	29%	31%	33%	30%	30%
F	37%	39%	27%	37%	43%	39%	22%	45%	39%	28%	27%

Location. Those who lived in the seven-county metro area had a significantly higher mean score on the energy knowledge section than those who lived in the non-metro area. Neither of those location groups, however, was significantly different from the other metro locations group.

Additional analyses were conducted to explore whether people living in different counties or regions scored differently on the knowledge questions about how most electricity is generated in Minnesota and what we currently do with nuclear waste in Minnesota.

Regarding how electricity is generated in Minnesota, results showed that 63.6% (N=7 out of 11) of those living in the area of the Buffalo Ridge Wind Towers (i.e., Lincoln, Lyon, Pipestone, Murray, Rock, and Nobles Counties) correctly answered the question, as did 45.5% (N=5 out of 11) of those living in surrounding counties of Yellow Medicine, Redwood, Cottonwood, Jackson, and Lac Qui Parle. The sample sizes were too low for this item to conduct a significance test. Two of eleven in each group incorrectly chose wind energy.

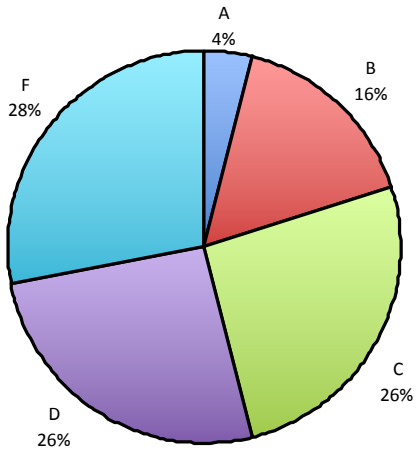
Regarding the item about what is currently done with nuclear waste in Minnesota, people living in counties with nuclear power plants (i.e., Sherburne, Wright, and Goodhue) were compared to those living in surrounding counties (i.e., Isanti, Mille Lacs, Benton, Stearns, Meeker, McLeod, Dakota, Rice, Steele, Dodge, Olmsted, Wabasha). Thirty-nine percent (N=16 of 41) of those living in counties with nuclear power plants correctly chose the option that nuclear waste is monitored at the power plant, compared to 35% (N=71 out of 203) who live in surrounding counties. The difference in percentages was not statistically significant. For the sake of comparison, the participants who lived in counties with nuclear power plants were also compared to another group of people, those who lived even farther away from these facilities (i.e. Beltrami, Cass, Koochiching, Itacsa, Aitkin, and Carlton). For those counties, about 26% of residents (N= 12 out of 47) correctly answered the item about nuclear waste. In all cases, the difference in percentages between county groups was not statistically different.

Combined knowledge scores of Minnesota residents

Figure 14 shows the combined knowledge scores for the two subsets of questions (all 13 knowledge questions). For the eight general environmental knowledge questions, 62% of Minnesota adults have at least an average or basic knowledge about the environment. A score of four or more correct answers is used as a measure of average or basic knowledge for this subset of questions. Thirty-six percent of Minnesota adults have an average or basic level of knowledge about energy issues. A score of three or more correct answers is used as a measure of average or basic knowledge for this subset of questions. For this combined set, 46% of Minnesota adults have at least an average or basic knowledge about the environment. A score of seven or more correct answers is used as a measure of average or basic knowledge. On the other hand, this indicates that 54% of the state's adults have a below-average knowledge about the environment. Looking at the combined scores, note that only 4% of the state's adults have an excellent knowledge about the environment, answering 11 or more questions correctly.

Figure 14. Combined knowledge scores for Minnesotans

For the combined questions, the following grading system was developed: A = 11-13 correct; B = 9-10 correct; C = 7-8 correct; D = 5-6 correct; F = 0-4 correct.



In the 2003 and 2001 Minnesota Report Card surveys, different sets of questions were used, so therefore it is not possible to make direct comparisons. However, it is interesting to note that in 2003, 50% of adults had an average combined environmental knowledge level, and in 2001, 46% had an average environmental knowledge level. From these three surveys, it seems that between 46 to 50% of Minnesota residents have an average or basic environmental knowledge. However, the question remains, is that a sufficient number of environmentally knowledgeable residents?

Demographics

When the demographics are examined for the 13 environmental knowledge questions, significant differences were found for most of the variables (Figure 15).

Gender. A gender gap similar to that of the two subsets of knowledge questions was found, with males scoring significantly higher than females. The mean score for males (7.2 out of 13) was significantly greater than the mean score for females (5.4 out of 13).

Age. The mean score for the 13 items increased in consecutive age categories until the 65 and older group. Those who were ages 55 to 64 had a significantly higher mean (6.7 out of 13) than those who were 65 or older (5.7 out of 13). The mean for those who were ages 25 to 34 was 5.8 out of 13 and the mean for those 45 to 54 was 6.4 out of 13. The age group 18 to 24 had the lowest mean score of any group (4.8 out of 13) but could not be tested in significance tests due to a small sample size.

Education. In relation to education levels, those Minnesota adults who have graduated from college scored significantly higher than respondents who had not attained this level of formal education. There were significant mean score increases with each increase of formal education. Those with a high school degree or less scored lower (5.2 out of 13) than those who had some college (5.8 out of 13), who in turn scored lower than those who had a college degree or more formal education (7 out of 13).

Income. For income levels, a significant pattern emerged, such that as income increased, the mean scores on the composite of all 13 items also increased. Specifically, those who made less than $30,000 had significantly lower mean scores (5 out of 13) than those in all the other income categories. Those who made $30,000 to $50,000 had significantly lower mean scores (5.9 out of 13) than those who made $75,000 or more (6.9 out of 13).

Location. Overall, there are significant differences between those who are in the seven-county metro area and those who are not in the metro area. Those in the non-metro area have a significantly lower mean score (5.8 out of 13) compared to those in the seven-county metro area (6.3 out of 13). Though the mean for those in the seven-county metro area was very close to those in other metro areas, there was no significant difference between the non-metro and other metro areas.

Figure 15. Demographic comparison of responses of Minnesota residents for 13 combined environmental knowledge questions

	Age						Education			Income			
	18-24	25-34	35-44	45-54	55-64	65+	HS or less	Some college	College degree	Less than $30K	$30-$50K	$50K-$75K	More than $75K
A	3%	3%	2%	5%	6%	3%	1%	3%	7%	1%	2%	5%	7%
B	0%	16%	16%	14%	23%	13%	10%	10%	24%	7%	15%	18%	20%
C	28%	19%	29%	32%	25%	24%	20%	27%	30%	19%	25%	27%	32%
D	28%	30%	23%	23%	27%	28%	30%	30%	20%	30%	27%	25%	23%
F	41%	33%	29%	26%	20%	32%	39%	31%	18%	42%	31%	24%	18%

Interactions for combined knowledge. A three-way analysis of variance was conducted to explore the main effects and interactions of education, income, and gender for combined knowledge. Results showed that there was a significant effect of each of those variables when considered one at a time. There were no significant two-way interactions (i.e., looking at two variables at the same time), nor a significant three-way interaction.

Self-reported knowledge of environmental issues

Minnesota adults were asked how much they feel they know about environmental topics (Questions 1a-e), including knowledge about: environmental problems, air pollution, energy issues, water quality, and global warming. They were asked to use a five-point scale that ranged from "nothing at all" to "a lot." First, the average of the five self-reported knowledge items (Questions 1a-e) was calculated for each person. Then, the average response was classified into 1 of 3 categories (3.5-5 was "high" self-reported knowledge, 3-3.49 was "moderate," and 1-2.99 was "low.") (Note: these ranges are based on a reversal of the survey scales. On the actual survey, 1 was "a lot" and 5 was "nothing at all.")

Results show that about 40% of Minnesotans reported they have a high level of knowledge about these topics. The scale in the 2007 survey was expanded from a four-point scale to a five-point scale compared to the previous two surveys and thus direct comparisons are not made. Interestingly on this 2007 survey, 43% earned an A or B on the general environmental knowledge items, but only 13% earned an A or B on energy knowledge and 20% earned an A or B on combined knowledge.

Demographics

Gender. Results show there are significant gender differences in self-reported knowledge. Thirty-three percent of females and 50% of males believe they are knowledgeable about environmental issues. Males believe they know more about environmental problems, air pollution, energy issues, and water quality as compared to the results for females. Males also self-report a higher level of knowledge about global warming compared to females, yet that difference was not statistically significant. While males self report a higher knowledge level, this is reflected in the environmental knowledge scores, where males do score higher than females.

Age. Age was significantly related to self-reported environmental knowledge. Thirty-five percent of those who were 65 and older had "high" self-reported knowledge while a higher proportion (approximately 44-47%) of those who were 45 to 64 had "high" self-reported knowledge.

Education. Education is significantly related to respondents' beliefs about their knowledge of environmental issues. Thirty-one percent of people who have a high school education or less (in terms of formal education) reported having relatively high knowledge about the environment, compared to 38% of people who have had some college and 48% who have a college degree or more formal education.

Income. As in 2001 and 2003, there is a relationship between income and self-reported knowledge of environmental issues. The percentage of people who had high self-reported knowledge about environmental issues was: 32% of people whose income was $30,000 or less, 32% of people whose income is greater than $30,000 to $50,000, 41% of people whose income was greater than $50,000 to $75,000, and 50% of people whose income was greater than $75,000.

Location. Unlike in 2001 and 2003, a significant difference based on location was found. Forty-three percent of people who lived in the seven-county metro area reported they had a relatively high level of knowledge while 36% of those who lived in the non-metro areas reported they had a relatively high level of knowledge. This was a significant difference.

Specific environmental topics

Minnesota adults were asked how much they feel they know about five specific environmental topics: environmental problems, air pollution, energy issues, water quality and global warming. Responses were on a five-point scale: 1 was "a lot" and 5 was "nothing at all."

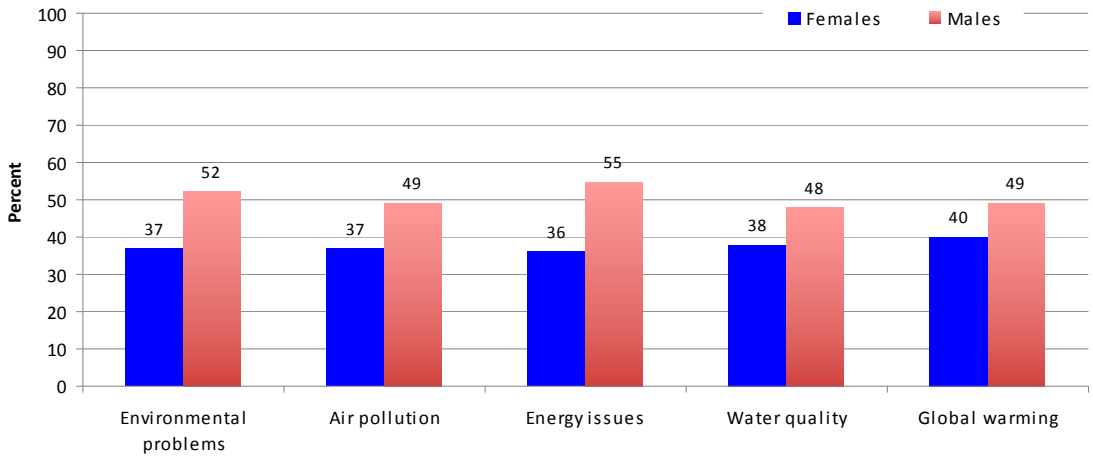
For individual items, responses of 1 and 2 were combined into a "high" self-reported knowledge category, 3 was coded as "medium" knowledge, and 4 and 5 were combined into a "low" self-reported knowledge category. Overall, 42 to 44% of people indicated they knew quite a bit about each of the five topics. In order they are: energy issues (44%), global warming (44%), environmental problems (43%), air pollution (42%), and water quality (42%). It is interesting that self-reported knowledge about energy issues was 44% when only 13% of people earned an A or B on the items that tested actual energy knowledge.

Demographics

In this section, the demographics of the respondents are examined in relation to each of the environmental topics.

Gender. Males reported they felt they knew more about each of the topics when compared to what females reported they knew. In all cases, the mean differences between males and females were statistically significant (Figure 16). This reflects the trend in the environmental knowledge scores for males and females.

Figure 16. Comparison of responses of Minnesota females and males on their self-reported knowledge of five environmental topics



The figure reflects the percentage of those with "high" self-reported knowledge, responses of 1 or 2 on the five-point scale where 1=a lot and 5=not at all.

Age. Overall, age was not significantly related to self-reported knowledge in the areas of environmental problems, air pollution, energy issues, water quality, or global warming. This is contrary to the findings in the actual knowledge scores, which showed some significant differences based on age (Figure 17).

Figure 17. Comparison of responses of Minnesota adults on their self-reported knowledge of five environmental topics by age

Environmental topic	18-34 years	35-44 years	45-64 years	65 or older
Environmental problems	44%	46%	45%	39%
Air pollution	33%	43%	45%	40%
Energy issues	40%	41%	50%	38%
Water quality	35%	39%	47%	40%
Global warming	42%	44%	46%	41%

The table reflects the percentage of those with "high" self-reported knowledge, responses of 1 or 2 on the five-point scale where 1=a lot and 5=not at all

Education. The amount of formal education Minnesota residents have is significantly related to their self-reported knowledge about environmental problems and global warming, but not for air pollution, energy issues, or water quality (Figure 18). Whether statistically significant or not, in all cases, more people with more formal education reported they knew about the topics than people who had less formal education. This reflects the trend in the environmental knowledge scores for residents with varying levels of formal education.

Figure 18. Comparison of responses of Minnesota adults on their self-reported knowledge of five environmental topics by education

Environmental topic	HS grad or less	Some college	College grad or more
Environmental problems	34%	41%	51%
Air pollution	37%	43%	44%
Energy issues	37%	45%	48%
Water quality	37%	42%	46%
Global warming	37%	41%	52%

The table reflects the percentage of those with "high" self-reported knowledge, responses of 1 or 2 on the five-point scale where 1=a lot and 5=not at all

Income. The level of income of participants was significantly related to their self-reported knowledge in the areas of environmental problems, energy issues, water quality, and global warming, but not air pollution (Figure 19).

Figure 19. Comparison of responses of Minnesota adults on their self-reported knowledge of five environmental topics by income

Environmental topic	Less than $30,000	$30,00-$50,000	$50,001-$75,000	Over $75,000
Environmental problems	37%	34%	45%	52%
Air pollution	40%	35%	42%	48%
Energy issues	34%	37%	50%	49%
Water quality	35%	37%	46%	47%
Global warming	37%	41%	42%	51%

The table reflects the percentage of those with "high" self-reported knowledge, responses of 1 or 2 on the five-point scale where 1=a lot and 5=not at all

Location. Location was not significantly related to Minnesotans' reports about what they know about environmental problems, air pollution, energy issues, water quality, or global warming. This is contrary to the findings in the actual knowledge scores, which showed some significant differences based on location.

Self-reported familiarity of laws and regulations

In addition to asking about people's evaluation of environmental laws and regulations, new items were added to the 2007 survey about Minnesotans' familiarity with laws and regulations. Both the familiarity and evaluation items in this survey asked about laws and regulations concerning: air pollution, water pollution, chemicals in food, land development, energy conservation and energy efficiency, and global warming.

Minnesotans were asked to indicate how familiar they were with laws and regulations using a five-point scale, where 1=very familiar and 5=not at all familiar. Responses were then combined into three categories: "high" familiarity consisted of responses 1 and 2, "moderate" familiarity was response 3, and "low" familiarity consisted of responses 4 and 5.

Overall, fewer than one-third of respondents indicated they were highly familiar with the laws and regulations related to the various issues: energy conservation and efficiency (31%), water pollution (29%), land development (28%), chemicals in food (26%), air pollution (25%) and global warming (23%). Figure 20 shows the detailed results. It is interesting to note that at the time of the survey, there were no definitive federal laws and regulations about global warming.

Figure 20. Percentage of Minnesotans who report each level of familiarity with laws and regulations for specific environmental topics

Environmental topic	High familiarity	Moderate familiarity	Low familiarity
Air pollution	25%	35%	40%
Water pollution	29%	34%	37%
Chemicals in food	26%	30%	44%
Land development	28%	27%	45%
Energy conservation and efficiency	31%	33%	36%
Global warming	23%	30%	47%

Participants were then asked about their attitudes toward the laws and regulations, specifically, if they had gone too far, not far enough, or struck about the right balance. The results of these questions are discussed in the next section of the report.

Connections with other research

The role environmental knowledge plays in environmental literacy has been researched for many decades. In the mid-seventies, the newly emerging field of environmental education sought a theoretical basis for changing environmental behaviors. An early and widely accepted model for this was based on the Model of Reasoned Action (Fishbein and Ajzen, 1975), and basically assumed that increased knowledge would result in favorable environmental attitudes and thus positive environmental behaviors. This relatively simplistic model was combined with new information based on research throughout the next decades, which resulted in various models, all of which lead to a new understanding of the complexities of environmental behaviors.

Arcury (1990) examined the relationship between environmental knowledge and environmental attitude. He found that respondents to a survey did not score as well on the measures of environmental knowledge as on attitudes. Arcury stated that environmental knowledge is found to be consistently and positively related to environmental attitudes, although the relationship is not especially strong. He concluded that the low level of environmental knowledge has disturbing implications for environmental policy.

Schahn and Holzer (1990) reported "neither of the knowledge scales [they used in their research] correlated significantly with self-reported behavior" (p. 773). However, they also believed that results from other research showed that "behavior can be effective only when people have a sufficient level of information. For behavior to be effective in the domain of environmental protection, a certain amount of information is necessary" (p. 773). Interestingly, in their research, Schahn and Holzer (1990) also consider the role of gender, knowledge, and behavior. In their survey, they asked participants if they stayed at home to do the housework; 17.3% of women stated they did, not one male stated this. They believe that as "women have much more experience in housework than do men and are more confronted with questions of environmentally appropriate behavior … this may lead to differences in environmental concern" (p. 778) between the genders.

In later research, Arcury and Christianson (1993) claim that better educated, younger, urban individuals are more concerned about the environment and express more positive attitudes toward the environmental movement. In addition, they highlighted six studies showing that gender (being male), education, income, and environmental attitudes have consistent positive associations with public environmental knowledge. However, they do not discuss in detail the relationship between environmental attitudes and knowledge. Similar findings are visible in the results of this survey.

Laurian (2003) stated that participation in environmental decision-making assumes an informed citizenry, an assumption she refutes in her research. Her analysis found that while newspapers and social networks can increase residents' awareness of local issues they fail to diffuse detailed information.

Energy has certainly become an important issue in 2008, with various initiatives taken at the state and federal levels to reduce dependency on foreign energy sources. One of these is the proposal to increase mileage

standards. Flamm (2007) in his research examined environmental knowledge and attitudes on vehicle ownership and use. For decades, Americans had continued to increase the number of miles driven, owned more vehicles, and shared them with others less often. Yet while many of these vehicles are more fuel efficient and have less emissions than 40 years ago[1], these gains have been offset by the increase in consumption. In his research, Flamm found that 1) those who reported pro-environmental attitudes know more about environmental impacts of their vehicles and use, 2) respondents with high levels of environmental knowledge own more fuel-efficient vehicles, and 3) in turn respondents who self-reported pro-environmental attitudes own fewer and more fuel-efficient vehicles, drive them less, and, therefore they consume less fuel than respondents who did not disclose pro-environmental attitudes. Public education and possibly social marketing campaigns based on these findings may help expand environmental knowledge and environmental attitudes to broader social and geographic contexts. (This research also does not take into account the impact of higher fuel costs.)

Various organizations across the state and around the nation have conducted environmental-themed surveys and while the results may not correlate directly, there are similar patterns among the surveys and some have produced similar results for comparable knowledge questions. In 2003, the Minnesota Pollution Control Agency (MPCA) and Office of Environmental Assistance (OEA) reported on a survey conducted with 11 government agency's staff about their views on climate change as an issue of concern and their level of awareness about the causes and possible impacts.[2] Seventy one percent of the respondents in the survey answered the question about the primary source of electricity generation in Minnesota correctly, while 43% of the general public was able to correctly identify the primary source of electricity production as coal in the 2003 Minnesota Report Card survey, and there has been a dramatic increase (56%) in the number of Minnesota residents answering this question correctly in 2007. Eighty-six percent of state agency personnel answered the question concerning the largest contributor to greenhouse gas emissions correctly in the 2002 MPCA survey; 51% of the general public answered the question correctly in this 2007 survey.

An energy survey of Americans from the Bush School of Government and Public Service, Texas A&M University (2006; 7_EE06_Chap3EnergyKnowledge Index.pdf) reported the following results: 74% of respondents answered correctly that fossil fuels are the main source of electricity generation in the U.S. and 86% answered correctly that they produce the most greenhouse gas emissions; and 20% of respondents answered correctly that spent nuclear fuel is stored at the nuclear power plant. The question relating to electricity generation shows a higher correct response rate for similar questions in the 2003 Minnesota survey (electricity generation in the U.S. (48%), but much higher than the 2001 NEETF/Roper survey (36%). However, 27% of Minnesota residents (2007 survey) and 47% of Americans (2001 NEETF/Roper) answered the question concerning spent nuclear fuel correctly.

Refer to Part 4 for a further discussion of the role of knowledge in environmental behavior.

1 In 1968, CAFÉ standards for passenger vehicles, cars, were 15 miles/gallon (http://www.nhtsa.dot.gov/cars/rules/cafe/HistoricalCarFleet.htm). By 1990, this had risen to 27.5 mpg and has not risen since then (U.S. Department of Transportation (2004).

2 The state agencies surveyed for the MPCA and OEA survey were Department of Administration–Materials Management, Resource Recovery, Travel Management Divisions, Department of Agriculture, Board of Water and Soil Resources, Department of Commerce–Energy Division, Department of Transportation, Department of Natural Resources, Department of Trade and Economic Development, Department of Health–Environmental Services Division, Office of Environmental Assistance, Pollution Control Agency, and Minnesota Planning.

Part 2
Environmental Attitudes

Adult Minnesota residents were asked a series of questions concerning *attitudes toward* the environment. The questions were divided into three sets: one dealing with environmental protection (Questions 3-8) which were asked in previous Minnesota report cards, the second based on attitudes toward energy (Questions 22 and 22b), and the third based on attitudes about environmental education in schools (Questions 23 and 23b).

Self-reported familiarity and attitudes toward environmental laws and regulations

In addition to asking about people's attitudes to environmental laws and regulations, new items were added to the 2007 survey regarding Minnesotans' familiarity with laws and regulations. Both the familiarity and attitudinal items in this survey referred to laws and regulations concerning: air pollution, water pollution, chemicals in food, land development, energy conservation and energy efficiency, and global warming.

Minnesotans were asked to indicate how familiar they were with laws and regulations using a five-point scale where 1=very familiar and 5=not at all familiar. Responses were then combined into three categories: "high" familiarity consisted of responses 1 and 2, "moderate" familiarity was response 3, and "low" familiarity consisted of responses 4 and 5.

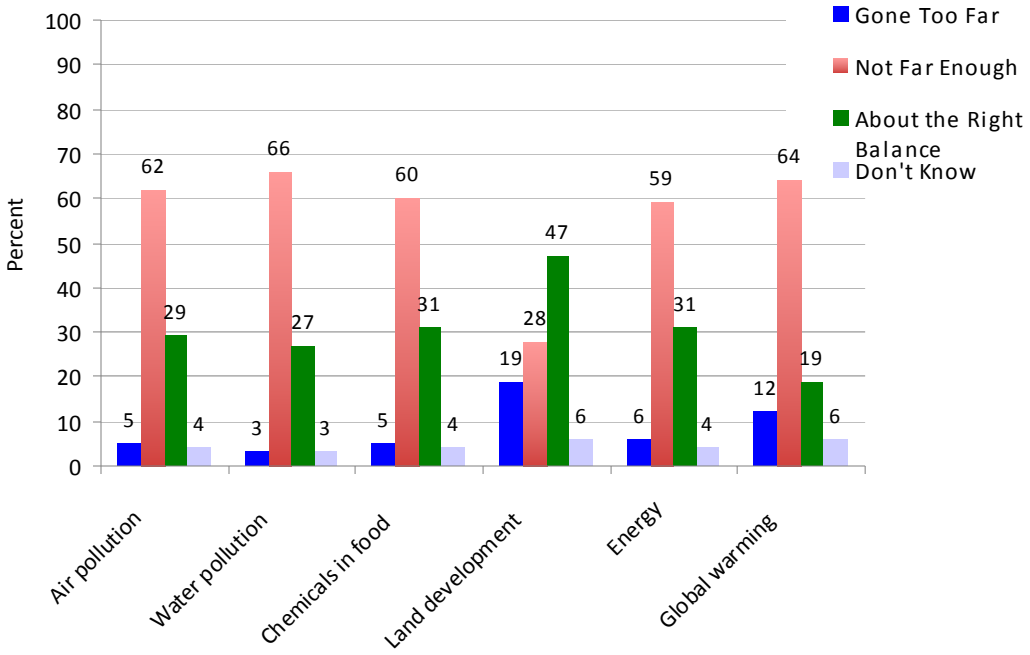
Overall, fewer than one-third of respondents indicated they were highly familiar with the laws and regulations related to the various issues: energy conservation and efficiency (31%), water pollution (29%), land development (28%), chemicals in food (26%), air pollution (25%), and global warming (23%). Figure 21 shows the detailed results.

Figure 21. Percentage of Minnesotans who report each level of familiarity with laws and regulations for specific environmental topics

Environmental topic	High familiarity	Moderate familiarity	Low familiarity
Air pollution	25%	35%	40%
Water pollution	29%	34%	37%
Chemicals in food	26%	30%	44%
Land development	28%	27%	45%
Energy conservation and efficiency	31%	33%	36%
Global warming	23%	30%	47%

Participants were then asked their attitudes toward the laws and regulations, specifically, if they had gone too far, not far enough, or struck about the right balance. Figure 22 shows the percentage of Minnesotans who chose each response option for the six topics. For all topics, except land development, 59 to 66% of Minnesotans reported they thought the laws and regulations have not gone far enough. For land development, 28% indicated they thought the laws and regulations have not gone far enough, 19% indicated they thought they have gone too far, and nearly half (47%) indicated they thought the right balance had been struck. Across all the items, fewer people reported they thought the laws and regulations have gone too far (3 to 19%) and 19 to 47% of people reported they thought the laws and regulations have struck about the right balance.

Figure 22. Percentage of Minnesotans who think that the environmental laws and regulations for specific environmental topics have gone too far, have not gone far enough, and have struck about the right balance

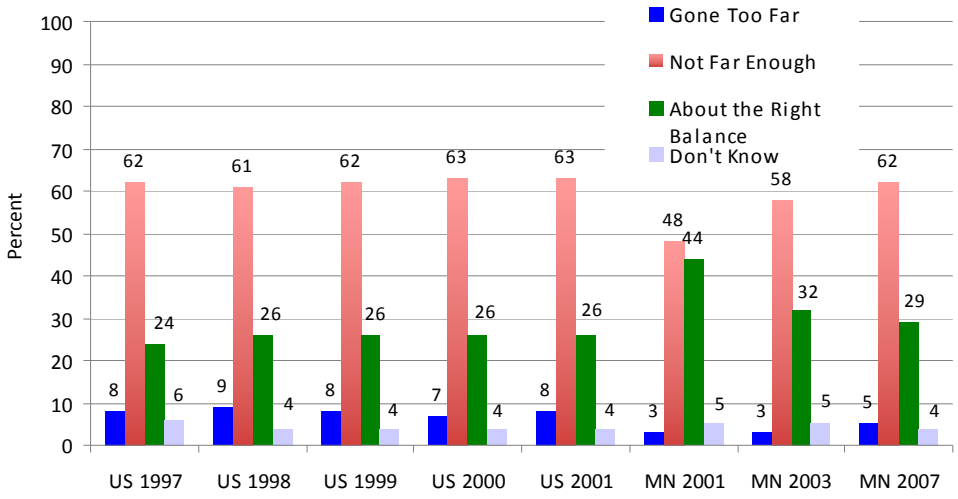


Comparing the same questions on air and water pollution between the 2001, 2003, and the current report card, few Minnesota residents believe that environmental laws have gone too far—only 5% or fewer gave such a response for the questions in the attitude section of the survey. The responses to laws and regulations on specific environmental issues show that Minnesotans still consider water pollution to be extremely important and that water is not safeguarded enough. The percentage downward change for this issue (3% from 2001 to this survey) is not statistically significant. It is interesting to note that while water pollution remains a concern, trepidation about air pollution has increased significantly between the surveys. In fact, the largest statistical change between the surveys has been in the attitude toward air pollution. Those who think that laws and regulations have not gone far enough have jumped 14 percentage points from 48% in 2001 to 62% in 2007. Correspondingly, those who think that the right balance has been struck in regulating air pollution have dropped 15%, from 44% in 2001 to 29%. This is clearly indicative that Minnesotans are increasingly of the opinion that laws and regulations preventing air pollution are not strong enough.

While the support for increasing regulation for air pollution is relatively high (62%), it is now closer to the national responses for this environmental issue than it has been in any of the previous surveys (Figure 23). This result for air pollution concern is also interesting considering that 74% of Minnesota residents knew the role of exhaust fumes in the creation of smog, 54% of those surveyed knew that carbon dioxide was a common greenhouse gas, and 51% knew that burning fossil fuels was the largest contributor to greenhouse gas emissions in Minnesota. The number of residents who believe that regulations have struck about the right balance is also closer to the national surveys.

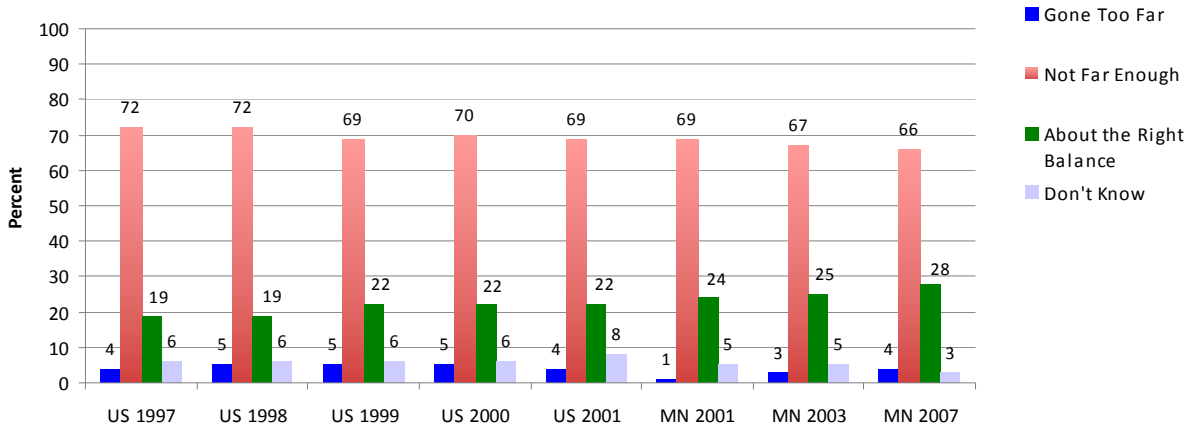
It is also important to note that while the difference in percentages between the response items "not enough laws" and the "correct balance" of regulation for air pollution has risen dramatically from 4% in 2001 to 33% in 2007, it is still less than the same statements for water pollution, where the difference is almost 39% (down from 46% in 2001), illustrating that Minnesota residents may have a relative greater concern for water pollution than air pollution.

Figure 23. Comparison of Minnesota and national responses to regulations for air pollution



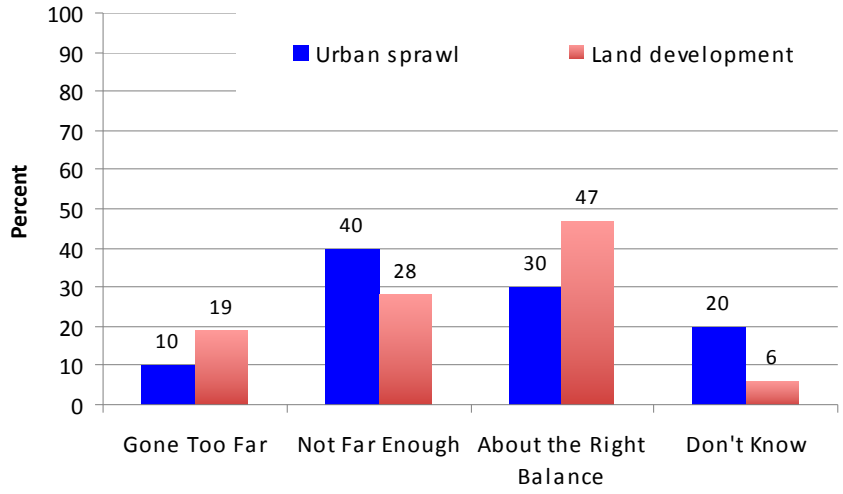
In relation to water pollution regulation, Minnesota adults still mirror the responses overall of those at the national level, although there has been a slight but insignificant change (Figure 24).

Figure 24. Comparison of Minnesota and national responses to regulations for water pollution



In this survey, a question was asked about laws and regulations controlling land development[3]. Figure 25 shows the results for this question. This was the only question where the highest number of residents (47%) believed that about the right balance had been struck for laws and regulations on any environmental issue. Twenty-eight percent of residents believed that the laws and regulations had not gone far enough, while 19% believed that they had gone too far. A question on laws and regulations controlling urban sprawl[4] was used in the survey in 2003. In that survey, 40% of the respondents thought that laws and regulations have not gone far enough on controlling sprawl, while 30% believed that the right balance has been struck. Interestingly, 20% of the respondents don't know what to think about the laws and regulations concerning this issue in 2003. This was the highest number of undecided respondents for any of the environmental issues considered in the previous surveys.

Figure 25. Comparison of responses to laws and regulations for urban sprawl (2003) and land development (2007)



Why is there such a difference between these two questions, urban sprawl and land development, when essentially the result is the same, changing land from one condition to another. Is it that urban sprawl seems more extreme than land development? When the definitions of urban sprawl and land development are examined, it seems perhaps that Minnesotans might consider these two actions very differently, as sprawl may have more of a negative connotation to it than land development.

For comparison, analyses about attitudes related to land development were conducted on several of the fastest growing counties (i.e., Crow Wing, Sherburne, Wright, Chisago, and Cass). As a reminder, across all counties, 19% reported that laws and regulations about land development have gone too far, 28% reported they have not gone far enough and 47% reported they have struck about the right balance. Results were somewhat different for the fastest growing counties: 30% reported laws and regulations about land development have gone too far, 30% reported they have not gone far enough and 40% reported they have struck about the right balance.

The topic of chemicals in food was also covered for the first time in this survey. Sixty percent of respondents thought that laws and regulations had not gone far enough, while 31% believed that the right balance had been struck (Figure 26). Women had more familiarity with these laws and regulations than men and also responded more often than men that these had not gone far enough. This may be based on the fact that women influence the spending of 77% of the retail dollar[5] and much of this is spent on food. This topic has been highlighted by reports from various federal and state agencies, and also by reports in the media. According to various federal agencies, half of the produce tested contains pesticide residues[6]; organophosphate pesticides are now found in 95% of Americans tested[7], and one of the main sources of pesticides for children is the food they consume.[8]

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3 Definition of land development—Process of improving raw land to support construction. The process may include planning, acquisition of government permits, subdivision, construction of access roads, installation of utilities, landscaping, and drainage. (http://www.answers.com/topic/land-development-2?cat=biz-fin).

4 Sprawl is defined as the spreading out of a city and its suburbs over more and more rural land at the periphery of an urban area. This involves the conversion of open space (rural land) into built-up, developed land over time (http://www.sprawlcity.org/hbis/wis.html).

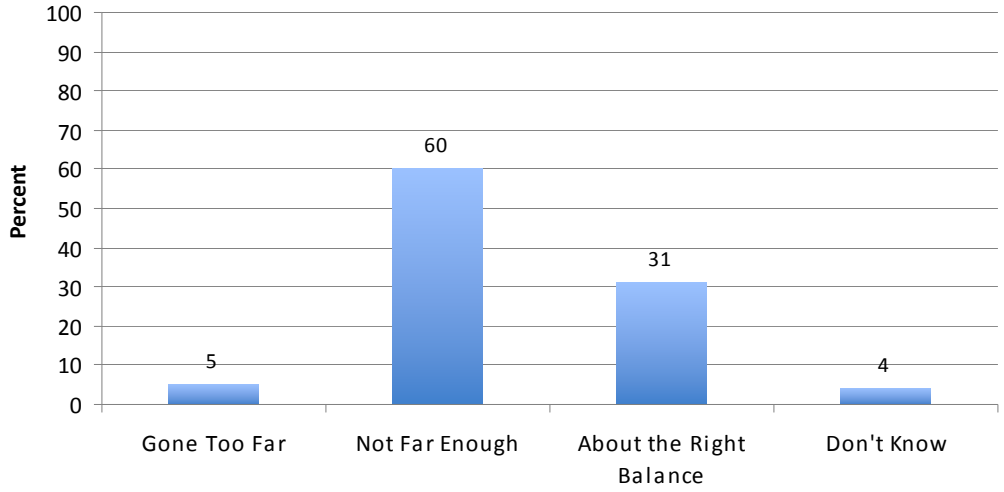
5 http://www.euromonitor.com/Who_Buys_What_Identifying_international_spending_patterns

6 CFSAN FDA Office of Plant and Dairy Foods; FDA Pesticide Residue Monitoring Program 1994-2002 http://vmcfsan.fda.gov/~dms/pesrpts.html

7 Department of Health and Human Services, Centers for Disease Control, *National Report on Human Exposure to Environmental Chemicals,*

In addition to this information covered in the mass media, the topic of drugs in America's drinking water has been featured in the media more recently[9], which may have impacted respondents' stance toward this issue.

Figure 26. Percentage of Minnesotans who think that the laws and regulations regulating chemicals in food have gone too far, have not gone far enough, and have struck about the right balance



Demographics

Gender. Compared to responses from females, males reported more familiarity with the laws and regulations concerning air pollution, water pollution, land development, and energy conservation/efficiency. The mean gender differences for these four topics were statistically significant. There were no significant differences between females and males on the topics of global warming nor for chemicals in food. Interestingly, females reported a higher, though not significantly higher, level of familiarity with laws and regulations regarding chemicals in food.

When asked to evaluate the laws and regulations, there were significant gender differences on all six topics. For all the topics except energy conservation/efficiency, proportionately more women reported that laws and regulations had not gone far enough by about 6 to 10% compared to men. On energy conservation and efficiency, 58% of women and 60% of men reported that the laws and regulations had not gone far enough. For each of the six topics, proportionately more men than women reported they thought that the laws and regulations had gone too far. The range for men across the six topics was 5 to 22% and the range for women was 3 to 16%.

Age. Age appeared to be a significant factor when comparing how familiar people reported they were with laws and regulations about air pollution, water pollution, chemicals in food, and land development. For each of those, age was significantly and positively correlated with reported familiarity such that the older a person was, the greater the familiarity she or he reported having with the laws and regulations related to these topics. There

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March 2003.
8 Department of Health and Human Services, Centers for Disease Control, *National Report on Human Exposure to Environmental Chemicals,* March 2003.
9 St. Paul Pioneer Press (Minn.) - July 21, 2007 - B1 Local. Chemical Holds up City Water Plant Source of Substance that's also in Metro wells is unknown; St. Paul Pioneer Press (MN) - July 11, 2007 - B2 Local, Residents can test Well Water for PFCs; http://www.startribune.com/lifestyle/health/12534756.html Biomonitoring: Has pollution spread to body?; http://www.startribune.com/local/east/11548696.html With waste afoot, drilling wells is mystery; http://www.startribune.com/local/11594116.html Monday: Hunting the invisible; http://www.startribune.com/science/11619411.html Good data in, good food out; http://www.washingtonpost.com/wp-dyn/content/article/2007/05/10/AR2007051001889.html FDA Finds Chinese Food Producers Shut Down

were no significant overall age differences for familiarity with laws and regulations about energy conservation/efficiency nor global warming.

Age did not appear to be a significant factor in evaluating laws and regulations. Although there appeared to be a slight trend that people between the ages of 55 to 64 reported that laws and regulations had not gone far enough for air pollution, water pollution, chemicals in food, and global warming compared to other age groups. In addition, people between the ages of 45 to 64 tended to report that laws and regulations had not gone far enough for energy conservation/efficiency compared to the other age groups.

Education. Overall, education is not related to how familiar people report they are on the laws and regulations about air pollution, water pollution, chemicals in food, energy conservation/efficiency or global warming. There seemed to be a slight relationship with land development such that people with less formal education tended to report lower familiarity with laws and regulations concerning land development.

Education was not related to evaluations of laws and regulations concerning air pollution, water pollution, land development, or global warming. When asked about chemicals in food, relatively more people with less formal education tended to report laws and regulations had not gone far enough. Contrary to this, when asked about energy conservation and efficiency, relatively more people with more formal education tended to report laws and regulations had not gone far enough.

Location. Location made a difference for familiarity about only one topic: laws and regulations concerning land development. People in the seven-county metro area, compared to people in other metro areas or non-metro, reported significantly less familiarity with laws and regulations concerning land development.

When evaluating laws and regulations, more people from the seven-county metro reported that laws and regulations about land development have not gone far enough. Additionally, more people from the seven-country metro area reported that laws and regulations about energy conservation and efficiency had not gone far enough.

Income. Income was not directly related to familiarity with or evaluations of laws and regulations concerning air pollution, water pollution, chemicals in food, land development, energy conservation/efficiency, or global warming.

Attitudes toward energy needs

Respondents were asked to select from a list of four options, which is the best way to address America's energy needs. Results showed that 67% of people thought developing renewable forms of energy would be the best way. The proportion of people who chose each of the remaining three options were roughly the same, and were much smaller: drilling for more oil and gas in the U.S. (8%), expanding nuclear power capabilities (9%), and using coal more effectively (7%). Eight percent of people indicated they did not know.

A follow-up question was asked of residents who answered that more oil and gas should be drilled for in the U.S.; the question probed if this included drilling on public lands such as national forests, wildlife refuges, national grasslands, etc. Of the 8% (83 people) of respondents who selected the option for more drilling, 71% (59 people) were in favor of drilling on public lands, 23% were not, and 6% didn't know.[10]

Demographics

Significance tests were conducted on just those who selected 'developing renewable forms of energy' as the sample sizes were too low for the other response options.

Gender. There was a significant difference in the proportion of females and males who selected the option of developing renewable forms of energy. Seventy-two percent of females selected that option while 61% of males selected that option. The reverse trend seemed to occur for the option about nuclear power: 16% of males and 4% of females chose this as the best way to address American's energy needs. (The sample size was too low to test whether the gender difference for nuclear power was statistically significant.)

[10] According to the Energy Information Administration, during the time of this survey the price of a gallon of gasoline in Minnesota fluctuated from $2.49 in September to $2.36 in October, ending at $2.60 in November 2007 (http://tonto.eia.doe.gov/dnav/pet/hist/d120620272m.htm).

Age. Age was a significant factor for those who selected the option of developing renewable forms of energy. Of those who were 65 years old and older, 57% chose developing renewable forms of energy, which is a significantly lower proportion than those in other age groups of whom 69 to 73% chose this option. The sample sizes were too low for the other options to conduct significance tests.

Education. Those who had some college and those who had a college degree or more selected the option of developing renewable forms of energy at a significantly higher rate (69% and 74% respectively) than those who had a high school degree or less formal education (56%).

Location. Sixty-seven percent of those who lived in other metro areas selected developing renewable forms of energy. This is not significantly different than the other two location categories of the seven-county metro area and the non-metro areas. There was, however, a significant difference between those two. Of those living in the seven-country metro area, 70% selected renewable energy, while 63% of those living in the non-metro areas selected renewable energy.

Income. Income was significant for those who selected developing renewable energy. Significantly fewer people who make less than $50,000 (63% for less than $30,000 and 64% for $30,000 to $50,000) selected renewable energy, compared to those who make $75,000 or more (73% for $75,000). Those earning $50,000 to $75,000, were not significantly different from the other income groups (66%).

Attitudes on choosing where to live

Participants were asked about the importance of six factors in deciding where to live (Questions 27A-F). Overall, the factor that seems to be most important is personal safety: 90% of participants rated this as highly important (Figure 27). This is followed by quality of schools; community spaces, such as parks and natural areas; and property taxes. The relatively less important factors are distance to work and living on a larger lot, although 48% and 44% respectively indicated this was highly important in their decision where to live.

Figure 27. Importance of various factors in deciding where to live (ranked in order of high importance)

Factors	High importance*	Moderate importance	Low or no importance
Personal safety	90%	6%	4%
Quality of schools	72%	8%	19%
Community spaces, such as parks and natural areas	67%	21%	13%
Property taxes	61%	26%	13%
Distance to work	48%	22%	26%
Living on a larger lot	44%	21%	35%

**Note: The response option to these items was 1 (very important) to 5 (not at all important). Responses for 1 and 2 were combined to make "high importance," response for 3 were defined as "moderate importance," and responses for 4 and 5 were combined to make "low or no importance." The percentages do not always add to 100 for each row, as some people did not respond to items or they indicated that the item was not applicable to them.*

Demographics

Gender. Participants were asked to rate how important various factors were in their decisions about where to live. There were significant gender differences on the issues of personal safety, such that women (92%) indicated personal safety was very important compared to 86% of men. Also, significantly more women (52%) indicated that distance to work was very important compared to men (43%). There were no significant gender differences in the factors of quality of schools, property taxes, community spaces and parks, or living on a larger lot.

Age. Age is significantly related to the importance people place on various factors when deciding where to live. People aged 25 to 44 (85%) placed high importance on quality of schools when deciding where to live compared to those who are 45 or older (61-76%). People aged 35 to 44 (95%) placed high importance on personal safety, which is significantly more than those 55 or older (87-88%). Property taxes seemed to have significantly higher importance to those 65 or older (72%) compared to those aged 35 to 64 (47-60%) and those aged 25 to 34 (46%). Distance to work was important to significantly fewer of those 65 or older (34%) compared to those younger than 65 (45-57%). Likewise, living on a larger lot was important to fewer of those 65 or older (32%) compared to those younger than 65 (41-49%). Interestingly, there were no significant

differences between age groups in terms of the importance placed on community spaces, such as parks and natural areas. Between 59% and 73% of people in each age group viewed community spaces as important.

Education. Significantly more of those with a college degree (77%) reported that quality of schools was important compared to those with some college (70%) and those with high school or less formal education (66%). Personal safety was rated as very important by significantly more people with some college (93%) than those with a college degree (86%). Property taxes were rated as very important by significantly more people with some college or less formal education (69-73%) compared to those with a college degree (47%). Community spaces, such as parks and natural areas, were rated as very important by significantly more people who had a college degree (74%) compared to those with some college or less formal education (60-62%).

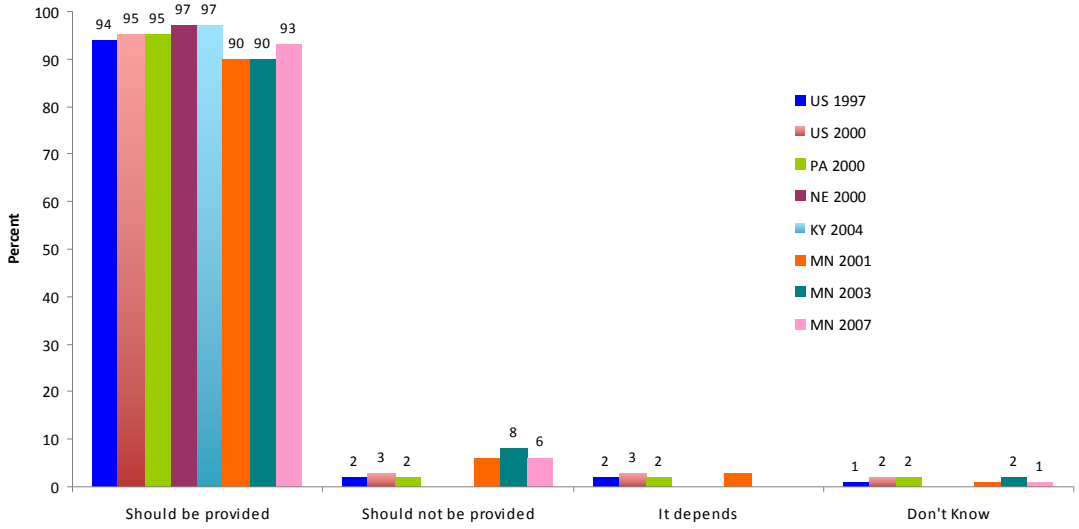
Location. Property taxes were rated as very important by significantly more people who lived in the other metro (66%) and non-metro (67%) as compared to those who lived in the seven-county metro area (56%). Living on a larger lot was rated as very important by significantly more people who live in other metro or non-metro (48-53%) compared to those who lived in the seven-county metro area (36%).

Income. Quality of schools was not rated as very important by as many people who made less than $30,000 (60%), as compared to those who earned $30,000 or more (74-79%). Property taxes were rated as very important by significantly more people who earned $75,000 or less (62-67%) compared to those who made more than $75,000 (51%). Community spaces, such as parks and natural areas were rated as very important by significantly more people who received more than $75,000 (70%) compared to those who earned less than $30,000 (61%). Living on a larger lot was rated as very important by significantly more people who made $50,000 or more (48-49%) compared to those who earned less than $30,000 (35%).

Attitudes toward environmental education

Minnesota adults were again asked a question about whether environmental education should be provided in schools (Questions 23). Response options in the 2007 survey were yes, no, and don't know. (Response options in previous Minnesota surveys included "it depends.") As shown in Figure 28, the vast majority of Minnesotans (93%) want schools to provide environmental education. This number remains constant from the 2001 and 2003 Minnesota surveys. This support is not surprising given the interest of residents in providing quality education to the state's children, and is not significantly different from the *Pennsylvania Environmental Report Card, Nebraska Conservation and Environmental Literacy and Awareness Survey, Survey of Kentuckians' Environmental Knowledge, Attitudes and Behaviors,* and *National Environmental Report Cards* for 1996, 1997, and 2000.

Figure 28. Comparison of adults' support for environmental education in schools ('K-12 schools' was used in the previous surveys, whereas just the word "schools" was used in the 2007 survey)



** For U.S. 2000, "Should not be provided" and "depends" total 3%.*

Participants were then asked about where they feel most of the funds for environmental education should come from (Question 23b). The response options were parents, businesses, schools, or a state fund. Respondents also had the option to indicate they didn't know. The majority of respondents indicated they thought support should come from a state fund (64%). Five percent chose parents, 14% chose businesses, 11% chose schools, and 6% indicated they did not know (Figures 29a and 29b).

Figure 29a. Respondents choose the following sources of funding in the 2003 survey.

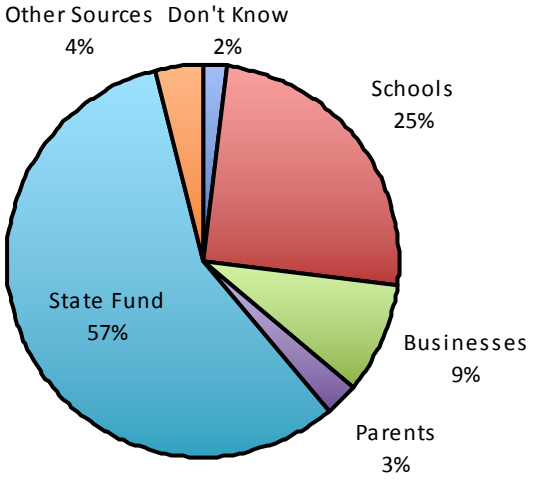
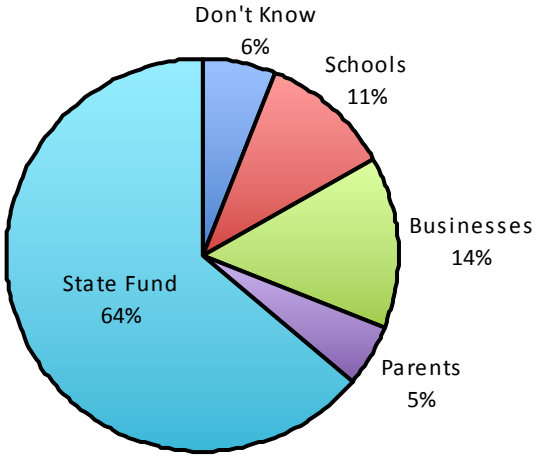


Figure 29b. Respondents choose the following sources of funding to provide environmental education in Minnesota's schools in the 2007 survey.



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Examining the results from the 2003 survey when a similar question was asked, there is a visible increase in residents choosing the state as the main funding source for environmental education in schools; while parents and businesses increased as a funding source, the number of adults choosing schools as a source decreased by more than 50%.

Demographics. Significantly more females (94%) think that schools should provide K-12 environmental education compared to males (91%). A similar difference was found in 2001 and 2003 although the gap narrowed in 2007. Trends across the other demographic characteristics did not show any significant differences among groups. Support did not vary by age, location, education, or income.

There were no significant differences based on gender, age, location, education, or income regarding what entity respondents thought should fund environmental education. (In many cases, the number of people in given categories was too low to conduct significance tests.)

Connections with other research

As previously discussed, other surveys around the state and nation by organizations have produced similar results for comparable questions. While the results may not be directly correlated, there are some similar patterns among the surveys. In the 2005 survey on American Attitudes on the Environment conducted by the Yale University School of Forestry and Environmental Studies, 68% of Americans thought that the federal government should do more for the environment, while 62% believed that state government should do more, and 59% thought that local governments should do more. While the statement "should do more for the environment" is broad, the percentages of Americans who indicated that governments at all levels should do more are similar to the percentages of residents who believe that laws and regulations for specific environmental topics have not gone far enough.

In the Yale 2005 survey, there was also broad support for an emphasis on finding alternative energy sources, including 90% of Americans supporting more solar power, 87% backing additional wind farms, and 86% supporting increased funding for renewable energy research.

In a 2006 survey of Minnesotan hunters and anglers, conducted by the Minnesota Conservation Federation and National Wildlife Federation, 64% of respondents thought that the best way to address America's energy needs was expanding the development of renewable forms of energy, while 9% replied that more oil and gas should be drilled for, even within wildlife refuges and other public lands. Even though the wording was altered somewhat for the question in this survey, the results in this 2007 survey were very similar.

However, according to a Pew Research Center for the People and the Press survey (2008)[11] "Amid record gas prices, public support for greater energy exploration is spiking. Compared with just a few months ago, many more Americans are giving higher priority to more energy exploration, rather than more conservation. An increasing proportion also says that developing new sources of energy—rather than protecting the environment—is the more important national priority" (http://pewresearch.org/pubs/884/gas-prices, paragraph 1). The survey also found that half of Americans now support drilling in Alaska's Arctic National Wildlife Refuge, up from 42% in February.

"The public's changing energy priorities are most evident in the growing percentage that views increased energy exploration—including mining and drilling, as well as the construction of new power plants—as a more important priority for energy policy than increased conservation and regulation. Nearly half (47%) now rate energy exploration as the more important priority, up from 35% in February. The proportion saying it is more important to increase energy conservation and regulation has declined by 10 points (from 55% to 45%).

In surveys dating to 2001, majorities or pluralities had consistently said that greater energy conservation and regulation on energy use and prices was more important than increased energy exploration" (http://pewresearch.org/pubs/884/gas-prices, paragraphs 3-4).

[11] The nationwide survey was conducted by the Pew Research Center for the People and the Press, from June 18-29, 2008 among 2,004 adults.

Part 3
Environmental Behaviors

Minnesota adults were asked a series of questions about their behaviors concerning a number of environmental actions, from conservation of energy and recycling to transportation choices and food buying choices. Participants were also asked the sources they use to get information about the environment. In total, there were questions on 12 actions or behaviors toward the environment (Questions 26A-L, 26BB), seven questions asking how much they use various sources to get environmental information (Questions 24A-G), five questions about the amount of information they get from specific sources (Questions 25A-E), and a question about the amount of time spent outside.

As with all self-reported behaviors, some caution is required in interpretation. In other words, there may not be a perfect correspondence between what people say they do and what they actually do. Other research also confirms this point (Brickman, Deutscher, and Wicker, cited in Hines, Hungerford and Tomera, 1986).

Recycling and food purchases

In this survey, a majority of Minnesotans (85%) indicated they frequently recycled items, such as newspapers, cans, and glass (Figure 25). For a similar question in 2001, 80% of Minnesotans reported that they frequently recycled. This high level of recycling behavior is reflected in a recent report from the Minnesota Pollution Control Agency, which states "Minnesota's recycling programs are among the nation's most successful, reflecting the strong local and state investment and public participation. In 2006, Minnesota's recycling rate (including credits for yard waste recycling and waste reduction efforts) increased by 0.2 percentage points to 48.7 percent.[12] The state's base recycling rate is 41.4 percent, an increase of nearly half of a percentage point from the previous year. The base recycling rate is a more accurate measure of progress as it is the actual percentage of materials recycled and does not include the additional source reduction and yard waste credits. While this growth reflects the significant state, local, and industry investment in our recycling system, as well as strong material markets, evidence suggests much more could be done to recover the millions of tons of discarded recyclable and organic material still disposed of each year" (*Report on 2006 SCORE Programs*, 2007, p. 3).

Three questions asked participants about their buying behaviors. One focused on electrical appliances (see next paragraph) and two centered on food. Regarding food purchases, 21% said they frequently bought organic food and 41% indicated they frequently purchased locally grown food. A similar question was asked in 2001 when results showed substantially fewer Minnesotans (9%) reported that they frequently purchase organic foods. This increase could be the result of various factors, such as increased opportunities to purchase organic products, and increased concerns about health. It should be noted that, according to the American Dietetic Association, "although organic foods generally are grown with lower levels of pesticides, no scientific evidence shows that these foods are healthier or safer than conventionally grown foods" (http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/home_4402_ENU_HTML.htm).

It is also encouraging that 41% of Minnesotans indicated that they frequently purchased locally grown food. This is a positive environmental behavior in part because of the growing concern of "food miles"—the distance a food item travels from the farm to your home (http://www.sustainabletable.org/issues/buylocal/ retrieved on June 5, 2008). "In the U.S., the average grocery store's produce travels nearly 1,500 miles between the farm where it was grown and your refrigerator" (Pirog, Rich, and Andrew Benjamin. *Checking the Food Odometer: Comparing Food Miles for Local Versus Conventional Produce Sales in Iowa Institutions.* Leopold Center for Sustainable Agriculture, July 2003). This concept is important as more food miles increase the environmental footprint for that item and the person consuming it.

[12] It is important to remember that the two percentages discussed in this paragraph indicate two different statistics. The first, 85%, states the number of Minnesotans who self-report recycling; the second, 48.7%, is a percentage of the materials recycled statewide.

Energy behaviors

Minnesotans also reported that they frequently conserved electricity (90%) by turning off lights and appliances when not in use. This is roughly the same as the results for the 2001 and 2003 surveys (89% and 87% respectively). Sixty-five percent said they frequently purchased lamps, light bulbs, and appliances that are energy efficient. When it comes to heating and cooling, 52% indicated they frequently ran the air conditioner less often in the summer and 69% reported they frequently lowered the thermostat in the winter.

The most recent report from the Minnesota Department of Commerce on energy however, shows that overall electricity use for residential consumers had increased to 18,744 gigawatt hours in 2005. This accounts for approximately 28% of the total electricity consumption in the state (*Minnesota Utility Data Book*, 2006). The typical electricity usage by a Minnesota household, according to the Minnesota Pollution Control Agency (http://www.pca.state.mn.us/programs/electricity-citizens.html) is 0.0084 gigawatt hours per year (i.e., 8,400 kilowatt hours per year). The increase between 2000 and 2005 for residential electricity usage was 19%. It should also be noted that between 2000 and 2005, the total number of residential electricity consumers in Minnesota increased approximately 10%. One possible explanation may be that while most Minnesotans may be making efforts to conserve energy, they may at the same time be using electricity for more items.

In relation to transportation, 13% indicated they frequently carpooled with others, 11% frequently biked or walked to work, and 6% frequently took the bus. When driving, 57% reported they frequently accelerated slowly. In the 2001 and 2003 surveys, 19% of Minnesotans reported using alternate transport frequently (the questions used in the previous surveys combined walking, biking, riding the bus, or carpooling rather than asking questions based on transit options). In 2007, Metro Transit reported that ridership increased by 13% and "for the first half of the year, customers boarded Metro Transit buses and trains 39.7 million times—7.9%, or 2.9 million rides, higher than the same period last year" (www.metrocouncil.org/directions/transit/transit2008/RidershipJul08.htm).

The University of Minnesota Humphrey Institute of Public Affairs provides information about bicycling in Minnesota. Per day, 1.4% of adults bicycle in the Twin Cities, in the U.S., this number is 0.9% of the population (2005). The report also states that "bicycle commuting may not remove that much traffic from the roads … of those who reported bicycling as their typical commute mode … only about 40% drove cars instead. … The others walked, rode transit, or rode in a car with someone else" (Commuting by bike: http://www.hhh.umn.edu/centers/slp/bike_basicfacts.html).

Figure 30. Self-reported frequency of environmental-related behaviors

Environmental behaviors	Frequently*	Sometimes	Rarely or never
Recycling and food purchases			
Recycle things such as newspapers, cans, and glass	85%	7%	8%
Buy organic foods on a regular basis	21%	21%	58%
Buy locally grown foods on a regular basis	41%	33%	25%
Energy behaviors			
Turn off lights and electrical appliances when not in use or when you leave the room	90%	5%	5%
Purchase lamps, light bulbs, and appliances that are energy efficient	65%	19%	16%
Run air conditioner less often in the summer	52%	24%	21%
Lower the thermostat in the winter	69%	17%	13%
Accelerate slowly when driving	57%	24%	18%
Bike or walk to work	11%	6%	68%
Use the bus	6%	3%	80%
Carpool with others	13%	12%	70%
Environmental donations			
Donate money annually to an environmental group or organization	24%	19%	57%

**Note: The response option to these items was 1 (almost always do it) to 5 (never do it). Responses for 1 and 2 were combined to make "frequently", responses for 3 were defined as "sometimes," and responses for 4 and 5 were combined to make "rarely or never." The percentages do not always add to 100 for each row as some people did not respond to items or they indicated that the item was not applicable to them.*

Environmental donations

The 60% of participants who indicated they donated money annually were asked to estimate the amount of their donations. This 60% includes everyone who responded 1, 2, 3, or 4 on a response scale of 1 (almost always do it) to 5 (never do it). Of these participants, 25% indicated they donated less than $50 per year, 18% indicated they contributed $50 to $99 per year, and 40% indicated they donated $100 or more per year. On the previous two surveys (2001 and 2003), participants were asked to indicate the frequency with which they donated; approximately 44% indicated they never donated to environmental organizations. Forty percent of participants in this study reported they never contributed money annually to an environmental group or organization. Caution should be used in comparing the results from previous surveys with the results from the 2007 survey as different scales were used, but it seems that approximately 60% of people are donating and of these, 58% are donating $50 or more on an annual basis. (Almost 17% of the participants who indicated that they donated chose not to disclose the amount.)

Demographics

Gender

There were no significant differences between women and men in 10 of the 12 behaviors assessed (Figure 31). It appears that women and men are thus very similar in most of their behaviors, such as recycling and reducing energy use. Women and men do differ on their behavior of food buying. Significantly more women frequently buy organic food and locally grown food on a regular basis than men. This should be interpreted with some caution though, as this may reflect a gender difference in the more general behavior of buying food on a regular basis.

Figure 31. Environmental behaviors of females and males*

Environmental behaviors	Females	Males
Recycling and food purchases		
Recycle things such as newspapers, cans and glass	84%	86%
Buy organic foods on a regular basis	24%	18%
Buy locally grown foods on a regular basis	46%	34%
Energy behaviors		
Turn off lights and electrical appliances when not in use or when you leave the room	91%	89%
Purchase lamps, light bulbs and appliances that are energy efficient	67%	62%
Run air conditioner less often in the summer	54%	49%
Lower the thermostat in the winter	69%	68%
Accelerate slowly when driving	56%	58%
Bike or walk to work	11%	12%
Use the bus	5%	7%
Carpool with others	14%	11%
Environmental donations		
Donate money annually to an environmental group or organization	24%	23%

**Note: Data in the table reflect the proportion of people who "frequently" engaged in the behaviors.*

Age

Age plays a significant role in a few of the environmental behaviors demonstrated by Minnesota adults and these results are outlined below (Figure 32).

Recycling and food purchases: Significantly fewer people between the ages of 25 to 34 reported they frequently recycled things such as newspapers, cans, and glass compared to those who are 65 or older. (There were too few people in the 18 to 24 year old category to conduct significance testing.)

Significantly fewer people 65 or older reported they frequently purchased organic foods on a regular basis compared to those younger than 65.

Energy behaviors: Significantly more people who were ages 45 to 64 reported they frequently purchased lamps, light bulbs, and appliances that are energy efficient compared to those who are younger than 35 years old or those who are 65 or older.

Significantly more people who were ages 35 to 54, compared to those who were 25 to 34 years old, reported they frequently ran air conditioner less often in the summer. Generally more people who were 45 to 64 years old reported they frequently lowered the thermostat in the winter compared to those who were younger than 45 or older than 64.

Significantly more people who were 45 years old and older reported they frequently accelerated slowly when driving compared to those younger than 45.

Donations: People who are ages 25 to 34 donated infrequently to an environmental group or organization compared to those who are 35 or older. This might be related to the typical financial flexibility or priorities people have at different ages and stages of their lives.

There were either too few people to conduct significance testing, or the results were not significant between age groups for: turning off lights and electrical appliances when not in use or when one leaves the room, biking or walking to work, using the bus, carpooling with others and buying locally grown food on a regular basis.

Figure 32. Environmental behaviors of participants by age*

Environmental behaviors	18-24	25-34	35-44	45-54	55-64	65+
Recycling and food purchases						
Recycle things such as newspapers, cans, and glass	69%	79%	83%	87%	85%	88%
Buy organic foods on a regular basis	24%	23%	23%	25%	23%	13%
Buy locally grown foods on a regular basis	35%	37%	38%	43%	46%	39%
Energy behaviors						
Turn off lights and electrical appliances when not in use or when you leave the room	76%	94%	94%	89%	90%	90%
Purchase lamps, light bulbs, and appliances that are energy efficient	48%	56%	65%	72%	73%	56%
Run air conditioner less often in the summer	24%	43%	57%	56%	56%	48%
Lower the thermostat in the winter	48%	59%	68%	78%	77%	60%
Accelerate slowly when driving	48%	24%	49%	61%	63%	65%
Bike or walk to work	17%	14%	11%	11%	12%	9%
Use the bus	24%	11%	3%	6%	7%	4%
Carpool with others	7%	13%	14%	16%	12%	9%
Environmental donations						
Donate money annually to an environmental group or organization	10%	16%	24%	29%	26%	21%

**Note: Data in the table reflect the proportion of people who "frequently" engaged in the behaviors.*

Education

There are some significant differences in environmental behaviors based on education and these results are outlined below (Figure 33).

Recycling and Food Purchases: Significantly more people with college degrees, as compared to those with some college, reported they frequently engaged in recycling behaviors. There were no significant differences between those with high school or less formal education and those who had some college or those with a college degree. Significantly more people with a college degree, as compared to those with some college or high school or less formal education, reported buying organic foods on a regular basis.

Energy behaviors: Significantly more people with college degrees, as compared to those with some college, reported running their air conditioner less often in the summer. There were no significant differences between those with high school or less formal education and those who had some college or those with a college degree. Significantly more people with a college degree, as compared to those with some college or high school or less formal education reported lowering their thermostat in the winter.

Donations: Significantly more people with college degrees, as compared to those with some college, reported donating money to environmental organizations. The sample size was too small for those with high school or less formal education and thus significant differences with that group could not be tested.

It is interesting to note that engaging in energy-conserving behaviors is not always done more frequently by those with more formal education. For example, although not statistically significant, those with less formal education tended to report they accelerated slowly when driving and carpooled with others more frequently than those with more formal education.

Figure 33. Environmental behaviors of participants by education*

Environmental behaviors	HS or less	Some college	College degree
Recycling and food purchases			
Recycle things such as newspapers, cans, and glass	85%	82%	87%
Buy organic foods on a regular basis	14%	19%	27%
Buy locally grown foods on a regular basis	41%	41%	42%
Energy behaviors			
Turn off lights and electrical appliances when not in use or when you leave the room	89%	91%	91%
Purchase lamps, light bulbs, and appliances that are energy efficient	61%	67%	65%
Run air conditioner less often in the summer	52%	47%	56%
Lower the thermostat in the winter	65%	65%	75%
Accelerate slowly when driving	60%	56%	55%
Bike or walk to work	11%	12%	11%
Use the bus	6%	3%	9%
Carpool with others	16%	11%	12%
Environmental donations			
Donate money annually to an environmental group or organization	10%	21%	35%

**Note: Data in the table reflect the proportion of people who "frequently" engaged in the behaviors.*

Location

There are a few significant differences in environmental behavior based on location of residence and these results are outlined in Figure 34.

Recycling and food purchases: Significantly more people who live in the seven-county metro area reported they frequently engaged in recycling as compared to those in other metro areas or in non-metro areas.

Additionally, significantly more people in non-metro areas reported they frequently purchased locally grown foods on a regular basis, compared to those who live in the seven-county metro area.

Figure 34. Environmental behaviors of participants by location*

Environmental Behaviors	7 county metro	Other metro	Non-metro
Recycling and food purchases			
Recycle things such as newspapers, cans, and glass	89%	81%	80%
Buy organic foods on a regular basis	23%	23%	18%
Buy locally grown foods on a regular basis	38%	44%	45%
Energy behaviors			
Turn off lights and electrical appliances when not in use or when you leave the room	89%	92%	91%
Purchase lamps, light bulbs, and appliances that are energy efficient	61%	69%	67%
Run air conditioner less often in the summer	53%	50%	51%
Lower the thermostat in the winter	71%	65%	68%
Accelerate slowly when driving	53%	60%	60%
Bike or walk to work	11%	13%	11%
Use the bus	9%	4%	4%
Carpool with others	12%	14%	13%
Environmental donations			
Donate money annually to an environmental group or organization	23%	23%	25%

**Note: Data in the table reflect the proportion of people who "frequently" engaged in the behaviors.*

Income

There were several significant differences in environmental behaviors based on income and these results are outlined below (Figure 35).

Recycling and food purchases: Significantly more people who earned more than $75,000 frequently recycled compared to those who receive $50,000 or less. Those who made more than $75,000 reported they frequently purchased organic food on a regular basis compared to those who earned $50 to $75,000 and to those who receive less than $30,000.

Energy behaviors: Those who make less than $30,000 tended to purchase lamps, light bulbs and appliances that are energy efficient less frequently than those earning $50 to $75,000. Significantly fewer people who made less than $30,000 reported they frequently ran the air conditioner less often in the summer and lowered the thermostat in the winter compared to those who receive $50 to $75,000 and those who earn $50,000 or more respectively. Significantly more people who made $50 to $75,000 reported they frequently accelerated slowly when driving compared to those who receive $30 to $50,000 or those who earned more than $75,000.

Donations: Significantly more people who made more than $75,000 donated money to environmental organizations frequently, compared to those who receive less than $75,000.

Figure 35. Environmental behaviors of participants by income*

Environmental behaviors	Less than $30K	$30K-$50K	$50K-$75K	More than $75K
Recycling and food purchases				
Recycle things such as newspapers, cans, and glass	81%	79%	86%	89%
Buy organic foods on a regular basis	17%	23%	18%	26%
Buy locally grown foods on a regular basis	42%	44%	37%	41%
Energy behaviors				
Turn off lights and electrical appliances when not in use or when you leave the room	91%	88%	93%	91%
Purchase lamps, light bulbs, and appliances that are energy efficient	52%	635	73%	70%
Run air conditioner less often in the summer	45%	52%	55%	53%
Lower the thermostat in the winter	60%	68%	71%	71%
Accelerate slowly when driving	60%	53%	63%	49%
Bike or walk to work	17%	12%	12%	8%
Use the bus	9%	8%	2%	6%
Carpool with others	15%	10%	12%	13%
Environmental donations				
Donate money annually to an environmental group or organization	12%	23%	22%	33%

**Note: Data in the table reflect the proportion of people who "frequently" engaged in the behaviors.*

Sources of information

A total of 12 questions were asked about sources people use to get information about the environment. The first seven questions (Questions 24A-G) asked how much people used different modes of information delivery/communication and the remaining five (Questions 25A-E) asked how much information Minnesotans get from specific sources.

Results show that Minnesotans seem to rely most on television and newspapers (either online or hardcopy). Next in line are the radio, magazines (either online or hardcopy), conversations with friends or neighbors and the Internet. The least used seems to be conversations with children about their environmental learning experiences (Figure 36).

Figure 36. Use of various modes of communication about environmental information

Communication mode used to get environmental information	High use*	Moderate use	Low use
Television	49%	27%	24%
Newspapers–either online or hardcopy	48%	25%	27%
Magazines–either online or hardcopy	31%	23%	46%
Radio	31%	22%	47%
Conversations with friends or neighbors	30%	33%	37%
Internet	27%	19%	54%
Conversations with children about their environmental learning experiences	17%	19%	64%

**Note: The response option to these items was 1 (used a lot) to 5 (do not use at all). Responses for 1 and 2 were combined to make "high use," response for 3 were defined as "moderate use," and responses for 4 and 5 were combined to make "low use." The percentages do not always add to 100 for each row as some people did not respond to items or they indicated that the item was not applicable to them.*

In relation to the Internet, Minnesotans are considered highly connected, with up to 71% of the state's population using the Internet (*A Nation Online*, 2004). In this same report, 36% of Americans reported in 2003 using the Internet to search for information about government services and agencies. In the 2007 Minnesota survey, 46% of participants reported that they use the Internet to obtain environmental information (combining high- and moderate-use participants, 27% and 19% respectively). This has increased since the 2001 Minnesota survey (36%). According to a 2006 report from the Pew Internet and American Life Project, "fully 87% of online users have at one time used the Internet to carry out research on a scientific topic or concept and 40 million adults (about 20% of the population) use the Internet as their primary source of news and information about science" (http://www.pewinternet.org/PPF/r/191/report_display.asp, retrieved August 15, 2008).

In the 2007 Minnesota survey, participants were also asked about the amount of information they get from specific sources. Overall, they reported getting the most from conservation or environmental groups, followed by environmental learning centers (including nature centers, parks, science museums, and zoos), scientific reports, and government agencies (see Figure 37). Results from an additional question showed that 21% of participants get environmental information from "other" sources. In comparison to the 2001 survey, it appears that Minnesotans got a greater amount of environmental information from government agencies, conservation or environmental groups but the amount of information from the environmental learning centers seems unchanged.

Figure 37. Amount of environmental information people get from sources*

Source of environmental information	Great amount*	Some amount	Small amount or none
Conservation or environmental groups	33%	25%	42%
Environmental learning centers, including nature centers, parks, science museums and zoos	26%	27%	46%
Scientific experts	25%	20%	54%
Government agencies (state or federal)	18%	26%	56%

**Note: The response option to these items was 1 (get a lot) to 5 (get none at all). Responses for 1 and 2 were combined to make "great amount," response for 3 were defined as "some amount," and responses for 4 and 5 were combined to make "small amount or none." The percentages do not always add to 100 for each row as some people did not respond to items or they indicated that the item was not applicable to them.*

Demographics

Gender. When it comes to sources of information, the results were mixed. Significantly more men frequently used the Internet (31%) and newspapers (either online or hardcopy) (53%) to get information about the environment compared to women (24% and 45% respectively). On the other hand, significantly more women frequently used television (53%) to get information about the environment than men (45%). Compared to women, significantly more men reported they got a lot of information about the environment from the government (men 25%, women 13%), conservation or environmental groups (men 37%, women 30%), scientific experts (men 32%, women 20%). There were no significant differences in the amount of information women and men obtained from environmental learning centers.

Age. Age was significantly related to some of the questions about sources of information. Significantly fewer people 65 or older (13%) used the Internet frequently to get environmental information, compared to those ages 55 to 64 (20%), which in turn used the Internet significantly less frequently than those 44 or younger (31 to 43%). People ages 25 to 34 (37%) tended to report they more frequently used conversations with friends or neighbors to get environmental information, compared to those 65 or older (24%). Those 35 to 44 years old (24%) tended to report they more frequently used conversations with children about their environmental learning experiences to learn about the environment compared to those 65 or older (15%). There were no significant differences between age groups for the use of newspapers, magazines, television, or radio.

When asked about the amount of environmental information people get from various sources, there were no significant differences between age groups for government agencies. At the same time, there were some significant differences for the other sources. Significantly more of those 35 to 64 years old (28 to 38%) reported they got a lot of information from conservation or environmental groups compared to those 65 or

older (24%). Significantly more of those ages 35 to 54 (32 to 40%) reported they got a lot of information from learning centers, including nature centers, parks, science museums, and zoos, compared to those ages 55 to 64 (22%) and those 65 or older (15%). Significantly more people 35 to 64 (26 to 30%) years old reported they obtained a lot of information from scientific experts compared to those 65 or older (18%).

Education. When asked about the sources they used to get information about the environment, there were some very clear and significant differences based on education. Significantly more people with a college degree (36%) reported they used the Internet a lot compared to those with some college (25%) and those who have a high school degree or less (16%). Significantly more of those with some college (49%) or a college degree (52%) reported they used newspapers a lot, compared to those who had high school or less formal education. Significantly more of those with a high school degree or less formal education (56%) reported using television to get environmental information compared to those who had a college degree (44%).

Participants were also asked how much information they got from various sources. Those with more education had significantly higher results for using conservation or environmental groups than those with less formal education (i.e., 43% for college degree, 31% for some college, and 19% for high school or less formal education). The same was true for the number of people who reported they got a lot of information from environmental learning centers, including nature centers, parks, science museums, and zoos (33% for college degree, 23% for some college, and 20% for high school or less formal education) and who reported they obtained a lot of information from scientific experts (36% for college degree, 22% for some college, and 13% for high school or less formal education).

Location. When asked about the sources of information, significantly more people in the seven-county metro area (30%) and in other metro areas (30%) reported they used the Internet often to get information about the environment, as compared to those who live in non-metro areas (22%).

Participants were also asked about the amount of information they got about the environment from various sources. Significantly more people who lived in the seven-county metro area (29%) reported they obtained a lot of information from scientific experts compared to those who lived in non-metro areas (20%).

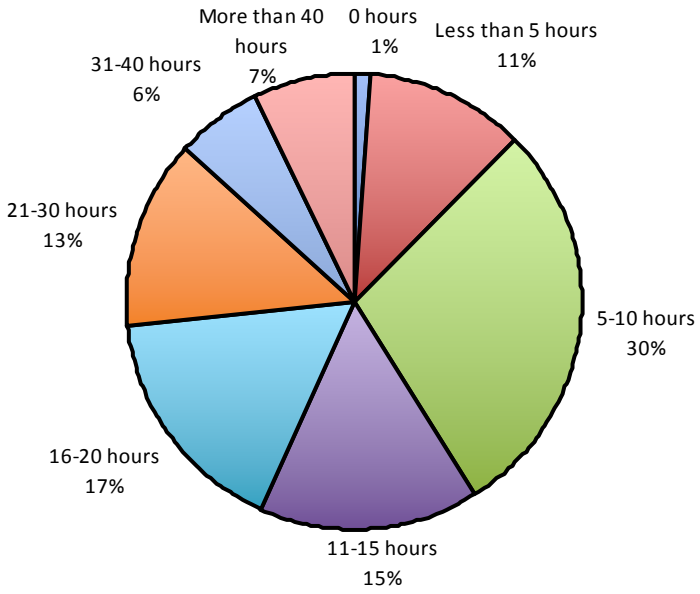
Income. When asked about how much they used various sources, there was a clear trend that more people with higher incomes reported they used the Internet a lot. Those who made $75,000 or more reported using the Internet a lot (38%) compared to those who received $30,000 to $75,000 (25 to 26%) and compared to those who earned less than $30,000 (16%). Those who made $50,000 or more reported using newspapers a lot, at a significantly higher rate than those who received $30 to $50,000. Significantly more people who earned $50,000 to $75,000 (39%) reported they used magazines a lot, as compared to those who made less than $30,000 (25%). Those who earned less than $30,000 reported using television a lot to get information about the environment compared to those who received $30,000 to $50,000 (46%) and those who earned more than $75,000 (41%). Significantly more people who made $30 to $50,000 (36%) reported they used conversations with friends or neighbors to get environmental information, compared to those who received less than $30,000.

Participants were also asked how much information they got from various sources about the environment. Significantly more people who made more than $75,000 (23%) reported they got a lot of information from government agencies, compared to those who received $50 to $75,000 (16%). More of those with higher incomes also reported getting a lot of information from conservation or environmental groups (i.e., 22% for those who made less than $30,000, 31% for those who earned $30,000 to $50,000, 35% for those who received $50,000 to $75,000 and 41% for those who made more than $75,000). Significantly more people who received $50,000 or more (29 to 35%) reported they obtained a lot of information from scientific reports compared to those who earned $30,000 to $50,000 (20%).

Time spent outside

One question asked participants to report the number of hours per week they spent outside, not including time spent for their employment. About 12% of respondents spend fewer than 5 hours per week outside, about 28% spend 5 to 10 hours per week outside, about 31% spend 11 to 20 hours per week outside, and about 27% spend 21 or more hours per week outside. It is interesting to note that 74 people (7.4%) indicated they spend more than 40 hours outside per week (See Figure 38).

Figure 38. Number of hours people spent outside per week, not including time spent outside for employment.



Note: Two people refused to answer the question and 29 indicated they didn't know. Some numbers are rounded for the chart.

In recently published research, Pergams and Zaradic (2008) state that "all major lines of evidence point to a general and fundamental shift away from people's participation in nature-based recreation. The cultural shift away from nature recreation appears to extend outside of the U.S. to at least Japan, and the decline appears to have begun 1981–1991. The root cause may be videophilia, as our previous work suggests. … Regardless of the root cause, the evidence for a pervasive and fundamental shift away from nature-based recreation seems clear" (p. 2299). The recent work of Richard Louv, author of *Last Child in the Woods* (2005), speaks to the need of connecting children with the outdoors. "A stronger adult emerges from a childhood in which the physical body is immersed in the challenge of nature. … A natural environment is far more complex that any playing field. Nature does offer rules and risks, and subtly informs all the senses" (Louv, 2005, p. 180). It may also be important to connect, or reconnect, adults with the outdoors and the natural environment to reverse this cultural shift away from nature-based recreation.

Demographics

Gender. Results suggest there is a significant difference based on gender. On average, men spent more time outside, not including time spent outside for employment, than women. Approximately 46% of females and 30% of males reported spending 10 hours or less per week outside, while approximately 50% of females and 69% of males reported spending 11 or more hours per week outside.

Age. Results showed no significant difference in time spent outside based on age.

Education. Results showed no significant differences in time spent outside based on education.

Income. Results showed no significant difference in time spent outside based on income.

Location. Results showed significant differences in time spent outside based on location. Those who live in non-metro areas and other metro areas reported spending significantly more time outside than those who lived in the seven-county metro area. While approximately 20% of those living in the seven-county metro area reported they spend 21 or more hours outside each week, 31% of those in other metro areas and 35% of those in non-metro areas reported they spend 21 or more hours outside each week.

Relationships between time spent outside and attitudes, behaviors, and knowledge

There were significant relationships between the amount of time people spent outside each week (not including time spent outside for employment) and: behaviors, self-reported knowledge, and general environmental knowledge. Interestingly, there was no significant relationship between the amount of time spent outside and attitudes.

Participants who reported spending more time outside also indicated they engaged in environmental behaviors more frequently and have higher levels of self-reported knowledge. They also had higher scores on general environmental knowledge and higher scores on combined knowledge. There was no significant relationship between time spent outside and knowledge about energy.

Connections with other research

Interestingly, in their research, Schahn and Holzer (1990) consider the role of gender, knowledge, and behavior. In their survey, they asked participants if they stayed at home to do the housework; 17.3% of women stated they did, not one male stated this. They believe that as "women have much more experience in housework than do men and are more confronted with questions of environmentally appropriate behavior….this may lead to differences in environmental concern" (p. 778) between the genders. However, in this Minnesota survey, it seems that females and males report very similar environmental behaviors with one exception, food purchases.

In a 2007 statewide survey on the specific environmental behavior of recycling, 96% of respondents said they or someone else in their household had recycled paper, cardboard, cans, plastic, or glass at home during the past 12 months; 89% of those said they recycled once a week or every other week. Data were analyzed with demographic information and significant differences were noted: lower income residents recycle less; Greater Minnesota residents recycle less often (many recycled once a month) and recycle more at drop-offs and recycling centers while metro residents recycle more at the curb or alley. Clearly convenience is a factor in this action (Armson, 2008).

The Environmental Issues Survey (EIS) conducted on the University of Minnesota Twin Cities campus in 2007 yielded the following results in relation to recycling, buying organic food, and buying locally grown food. For the University of Minnesota survey, recycling of aluminum, plastic, paper, and glass was asked for each individual material while in the statewide survey these materials were combined into one question. Nine hundred and twenty-three students on the Twin Cities campus were surveyed for the EIS. Figure 39 compares the results from both surveys; a high proportion of both groups report that they recycled; while a higher number of Minnesota residents reported that they frequently purchased organic or locally grown foods as compared to the students (not surprising perhaps given income disparities). More students reported that they "sometimes" engaged in this behavior than do Minnesota residents.

Figure 39. Results from a survey conducted on the University of Minnesota Twin Cities campus compared with results from this statewide survey.

	Always/most of the time (frequently*)		Sometimes		Rarely/never	
	UMN college students	Minn. residents	UMN college students	Minn. residents	UMN college students	Minn. residents
Recycling (aluminum, plastic, paper, glass)	68-80%	85%**	16-28%	7%**	4-7%	8%**
Buying organic foods	10%	21%	55%	21%	35%	58%
Buying locally grown food	9%	41%	66%	33%	25%	25%

** This is same as "frequently" used in the statewide survey of adults.*
***Numbers in this column are from this statewide survey of adults.*

A survey conducted by the U.S. Fish and Wildlife Service in 2006 reported the numbers of people participating in specific outdoor recreation activities (hunting, fishing, and wildlife-watching). While there was an increase in the number of adults involved in these outdoor activities overall, there was a decline in those participating in hunting and fishing. "The increase in wildlife-related recreation participation from 2001 to 2006 was due to wildlife watching (observing, feeding, and photographing wildlife). During this period, the number of people wildlife watching increased by 8 percent" (p. 6) from 66.1 million in 2001 to 7.1 million in 2006; the national population grew by 20% during the same time period. So, it does seem that more people are spending more time outside for specific nature related activities. An earlier survey conducted by the Minnesota Department of Natural Resources (Kelly, 2005) found that 57% of Minnesotans reported that outdoor recreation is "very important" to their life, while an additional 25% reported that it was "moderately important." In rank order, the respondents reported that their reasons for using the outdoors, included:

- enjoying nature
- exercising and feeling healthier
- building bonds with family and friends
- escaping pressures of modern life
- experiencing peace and quiet
- learning and exploring

The following activities were reported as most popular among Minnesotans (in order of importance):

- walking/hiking
- boating
- swimming
- driving for pleasure
- picnicking
- fishing
- biking
- visiting outdoor zoos
- camping
- visiting nature centers
- nature observing

Minnesotans clearly do enjoy the natural resources and nature-related experiences available to them. "In terms of hours of activity participation, walking/hiking is the leading activity among Minnesota adults. This is followed by boating, nature observation, fishing, swimming, and hunting, all water-based and wildlife-related activities that Minnesotans have a well-deserved reputation for being highly engaged in" (Kelly, 2005, p. 6). However, "there is increasing concern in Minnesota and elsewhere that fewer young people are getting outdoors in a significant way. "When we got the data back, it really confirmed what some people were thinking might be happening," says Wayne Sames, coordinator of the DNR's State Comprehensive Outdoor Recreation Plan 2008 to 2012 (SCORP). "The survey was only of adults; what's happening with kids is a little bit more anecdotal, coming from multiple sources, like recreation programming people who actually observe who's showing up in the parks" (www.parksandtrails.org/news_events/news/new_focus_getting_kids_and_young_people_outdoors, retrieved on November 20, 2008).

Part 4

Environmental Literacy

Exploring relationships among environmental knowledge, attitudes, and behavior

This statewide survey has reported on Minnesota adults' environmental knowledge, attitudes, and behaviors. In this part of the report, relationships among all three are explored.

Self-reported knowledge of the environment

Minnesotans were asked to indicate how much they know about environmental topics, including environmental problems, air pollution, energy issues, water quality and global warming. They were asked to use a five-point scale that ranged from "nothing at all" to "a lot." Responses were subsequently combined into three categories (3.5-5 were "high", 3-3.49 were "moderate" and 1-2.99 were "low.") Overall, approximately 40% of participants self-reported they had "high" knowledge of these areas, 29% had "moderate" self-reported knowledge, and 30% had "low" self-reported knowledge.

Figure 40 shows that self-reported knowledge is not perfectly related to the scores on the combined knowledge test. Seventy-one percent of those who earned an A on the combined knowledge test (i.e., 11-13 items correct) reported they had high environmental knowledge. This percentage drops as the grade earned on the knowledge test drops, but it is interesting to note that 36% of people who earned a D and 28% of people who earned an F reported they had a high level of knowledge about the environment.

Figure 40. Minnesota residents' combined environmental knowledge score and their self-reported knowledge of environmental issues and problems (column percentages)

	Combined environmental knowledge grade/number correct*				
Self-reported knowledge	**A (11-13)**	**B (9-10)**	**C (7-8)**	**D (5-6)**	**F (0-4)**
High	70.7%	60.9%	41.1%	35.8%	28.1%
Moderate	17.1%	19.9%	34.0%	32.3%	29.5%
Low	12.2%	19.2%	24.9%	31.9%	42.4%

**Score out of 13 combined environmental knowledge questions*

Demographics

There are significant relationships between self-reported environmental knowledge and: gender, age, education, income, and location. Significantly more males (50%) reported a high level of knowledge compared to females (33%), while significantly more females (36%) reported a low level of knowledge compared to males (23%). This follows the trend of the combined knowledge results where the mean score for males (7.2 out of 13; 55% correct) was significantly greater than the mean score for females (5.4 out of 13; 42% correct). While the trend was similar, all of the participants may have overestimated how much they actually know.

Significantly fewer people who were 65 and older (35%) reported having high environmental knowledge compared to those aged 45to 64 (44-47%). Only 29 people indicated they were aged 18 to 24, but of those, almost half (48%) reported having low environmental knowledge. This also follows the trend of the combined knowledge. The average combined knowledge score was highest for participants who were 45 to 64 years old (6.6 out of 13; 51% correct).

Those with more formal education indicated higher self-reported environmental knowledge (48% of those with a college degree had high self-reported environmental knowledge, 38% of those with some college, and 31% of those with high school or less formal education). Those with more formal education also had higher

combined knowledge scores. The average number correct on the combined knowledge test was 7 out of 13 (54% correct) for those with a college degree, it was 5.8 out of 13 (45% correct) for those with some college, and it was 5.2 out of 13 (40% correct) for those with high school or less formal education.

Significantly more people who made $75,000 or more (50%) indicated high self-reported knowledge compared to those who made less than $50,000 (32%). Participants who reported higher incomes also had higher scores on the knowledge test.

Finally, significantly more of those who live in the seven-county metro area indicated high self-reported environmental knowledge (43%) compared to those who live in non-metro areas (36%). Those in the seven-county metro area also had significantly higher means (6.3 out of 13; 48% correct) than those in the non-metro areas (5.8 out of 13; 45% correct) for the combined knowledge test.

Other scales of measurement

To assist in the data analysis and to examine possible relationships among general environmental knowledge on attitudes and behaviors, two other scales were developed—an attitude scale and a behavior scale. A different number of attitude and behavior questions were asked in this survey as compared to the two previous surveys. However, the scales were generated with the same process.

Environmental attitude scale. An environmental attitude scale was constructed with questions 3 to 8, which asked people what they believed about environmental laws and regulations. These items had a three-point scale: 1= gone too far, 2=struck the right balance, and 3=not far enough. For each person, the mean of her/his responses across the six items was calculated. "Low" attitudes (ones in which people thought laws and regulations have gone too far) includes mean values of 1 to 1.99, "medium" includes means of 2 to 2.49, and "high" includes means of 2.5 to 3. Overall, 10% of participants reported "low" attitudes (i.e., they believed the laws and regulations have gone too far), 23% believed they have struck the right balance, and 66% believe they have not gone far enough.

Comparing the environmental attitude scale with the correct answers on the combined knowledge test, the people who correctly answered more items on the combined knowledge test tended to respond that they thought environmental laws and regulations have not gone far enough. Of those who earned an A on the knowledge test, 83% reported they believed laws and regulations have not gone far enough, compared to 76% of those earning a B and 59 to 67% earning a C or less.

While the self-reported knowledge and combined knowledge seemed to follow similar trends in terms of group differences, it is worth noting that the varying groups tended to get around 50% or fewer items correct. While this may indicate that the items used on this survey to test overall knowledge were difficult, it may likely indicate that in general, people do not know as much as they could about the environment.[13]

Figure 41. Comparison of combined environmental knowledge grade to environmental attitudes (column percentages)*

Environmental attitudes	Combined environmental knowledge grade				
	A (11-13)	B (9-10)	C (7-8)	D (5-6)	F (0-4)
High (Laws and regulations have not gone far enough)	83.3%	75.5%	66.7%	64.6%	59.2%
Moderate (Laws and regulations about right)	11.1%	16.8%	24.6%	22.0%	29.6%
Low (Laws and regulations have gone too far)	5.6%	7.7%	8.8%	13.5%	11.2%

**Percentages are based on those who responded to these items (N=853, 147 could not be classified because there were some missing data for the attitudes).*

[13] It is also important to note that the way knowledge was tested, with multiple-choice items, is only one way to test knowledge about the environment.

Environmental behavior scale. A behavior scale was constructed with 12 behavior items. A five-point frequency scale was used for each of these items, 1=almost always do it and 5=never do it. This scale was constructed in a manner similar to the attitude scale, with low, medium, and high. The categories were split as follows: low (1-2.99), medium (3 to 3.49), and high (3.5 to 5). Overall, 42% of those who responded to these items were categorized with low behaviors, 36% with medium behaviors, and 22% with high behaviors.

Figure 42. Comparison of combined environmental knowledge grade to environmental behaviors undertaken frequently by residents (column percentages)*

Environmental behavior	Combined environmental knowledge grade A (11-13)	B (9-10)	C (7-8)	D (5-6)	F (0-4)
High (3.5-5)	32%	25%	22%	19%	18%
Medium (3-3.49)	29%	42%	40%	34%	30%
Low (1-2.99)	39%	33%	38%	47%	52%

**Percentages are based on those who responded to these items (N=764, 236 could not be classified due to missing data.)*

The results comparing the knowledge grade and environmental behavior scale scores show somewhat mixed results. While 32% of those who earned an A on the knowledge test were categorized with "high" environmental behaviors, 39% who earned an A were classified with "low" environmental behaviors. The number proportion of people categorized with "high" environmental behaviors is highest for those who earned an A and gets progressively less as the grade drops.

Overall, more people who were categorized with high environmental behaviors tend to also report that laws and regulations have not gone far enough (77%) compared to those who have medium environmental behaviors (70%) and those who have low environmental behaviors (56%) (Figure 43). Conversely respondents who had a low environmental attitude also reported low environmental behaviors (18%).

Figure 43. Comparison of environmental behaviors and environmental attitudes about laws and regulations (column percentages)*

Environmental attitudes	Environmental behavior High (3.5-5)	Medium (3-3.49)	Low (1-2.99)
High (Laws and regulations have not gone far enough)	77%	70%	56%
Medium (Laws and regulations about right)	21%	23%	27%
Low (Laws and regulations have gone too far)	3%	8%	18%

** Percentages are based on those who responded to these items (N=662, 338 could not be classified because due to missing data.)*

Environmental knowledge, attitude, and behaviors

To further explore the effects of attitudes, self-reported environmental knowledge and combined environmental knowledge on environmentally conscious behaviors, a three-way analysis of variance was conducted. First, the mean of the 12 behavior items (Q26a-Q26l) was calculated for each person, where 1=almost always do it and 5=never do it. The average behavior score was 2.88 (SD=0.57). Results showed that there was a significant effect for attitudes such that those with "lower" attitudes (i.e., reporting they think environmental laws and regulations have gone too far) tended to be categorized as engaging in environmentally conscious behaviors less frequently. There was not a significant effect for self-reported knowledge or combined knowledge when looked at one at a time. There were also no significant two-way interactions (i.e., looking at two variables at a time) nor a significant three-way interaction (i.e., looking at the effects of attitudes, self-reported knowledge, and combined knowledge at the same time).

Environmental literacy research

Although the term environmental literacy is now becoming more popular in mainstream conversation and in the environmental arena, it has been discussed, defined, and clarified within environmental education for decades. Roth in his work, *Environmental Literacy: Its roots, evolution and directions in the 1990s* (1992), documents the development of this term. He states "environmental literacy is the capacity to perceive and

interpret the relative health of environmental systems and to take appropriate action to maintain, restore or improve the health of those systems" (p. 8).

A more recent 2008 definition from *A GreenPrint for Minnesota: State plan for environmental education, third edition* states:

> "People who are environmentally literate:
> - Understand the complexity of natural and social systems and their interrelationships.
> - Demonstrate the knowledge, skills, attitudes, motivation, and commitment to work individually and collectively toward sustaining a healthy natural and social environment.
> - Have the capacity to perceive and interpret the health of environmental and social systems and take appropriate action to maintain, restore, or improve the health of those systems" (p. 3).

These definitions include aspects of environmental knowledge, attitudes, and behaviors. There is also a general concern about America's scientific literacy level. According to Miller's most recent work (2007), approximately 28 percent of American adults currently qualify as scientifically literate, an increase from around 10 percent in the late 1980s and early 1990s (Michigan State University, 2007)

As mentioned in Part 1, environmental knowledge plays an important role in environmental literacy, but so too does attitudes and behavior. After all, environmental literacy concerns the development of citizens who act responsibly toward the environment. Over the past few decades, researchers have realized that the straightforward models that depict environmental behavior were too simplistic in nature. In these models, knowledge was believed to impact attitudes and consequently change behaviors and promote actions. Therefore, providing people with environmental knowledge would ultimately impact behaviors toward the environment. However it did become obvious that this model was too simplistic and additional research showed that this indeed was the case.

In a more recent meta-analysis of research, Bamberg and Moser (2007) found similar correlations between psycho-social variables and pro-environmental behaviors as did Hines, Hungerford, and Tomera (1986). In addition, they report that "results confirm that besides attitudes and behavioral control personal moral norm is a third predictor of pro-environmental behavior intention…..problem awareness is an important but indirect determinant of pro-environmental intention" (p. 14).

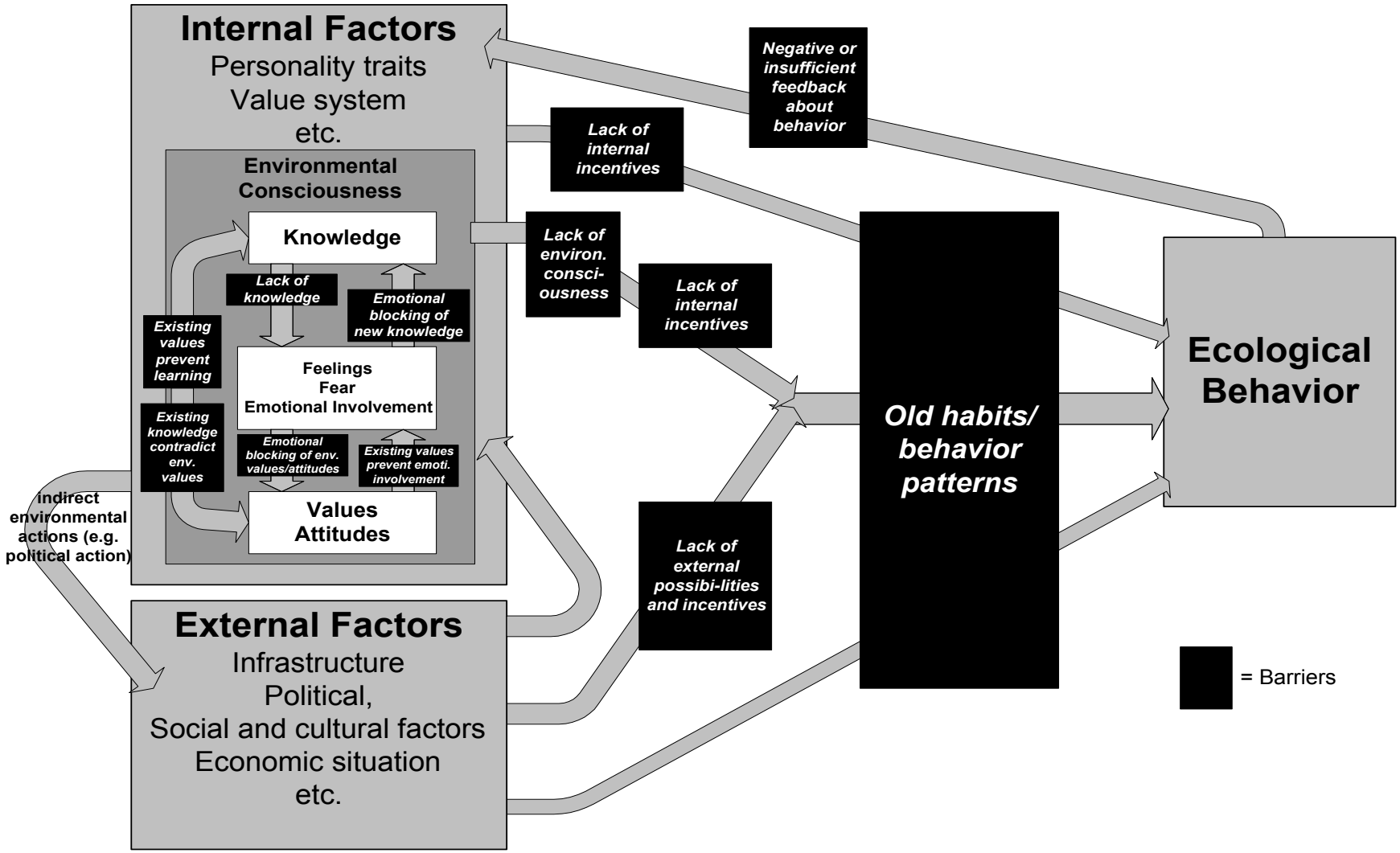
Given this knowledge, researchers have developed principles to work with specific audiences to create positive change in environmental behavior. Gardner and Stern in 1996 developed a set of "principles for intervening to change environmentally destructive behavior." Stern (2000) further refined this approach.

More recent models visualize the complexity of encouraging responsible environmental behaviors, such as Kollmuss and Agyeman's (2002) model of pro-environmental behavior (Figure 44). These models and frameworks for promoting environmental behavior recognize and incorporate the many factors that impact a personal decision.

So, how does this, and previous, *Minnesota Report Cards on Environmental Literacy* connect to the research about environmental literacy? It is clear from the results of this and the previous surveys that a connection exists between the environmental knowledge, and self-reported attitudes and behaviors of Minnesota residents. However, if a higher level of environmental behaviors is to be promoted, what factors are required to move citizens from a medium level to the high level of behavior? Is it the acquisition of knowledge or more affective (attitudinal) education (or experiences) that is required to promote more positive environmental behaviors? What about the role of the various factors that can influence a person's decision or intention to act and his/her taking action? What about the specific audience and the action to be targeted?

It does seem that Minnesota residents are willing to engage in environmentally friendly behaviors, but more research is required on the combinations of knowledge and attitudes in the creation of an environmentally literate population. These are important considerations when planning environmental educational programs for the general public. So, while the focus of environmental education may require some change, it does play an integral component in assuring an environmentally literate Minnesota and is an area that has strong support by the public.

Figure 44. Kollmuss & Agyeman's Model of Pro-environmental Behavior (from Kollmuss & Agyeman, (2002), p. 257)



Appendix A
Survey Instrument

The questions used in this survey came either directly or were adapted from the following sources: various National Environmental Education Training Foundation/Roper Starch Worldwide Surveys, and the two previous *Minnesota Report Cards on Environmental Literacy*. Questions measured respondents' knowledge, attitudes, and behaviors toward the environment. Asterisks (**) indicate the correct answers in the case of knowledge questions and a location for more information on the answer.

Introduction and screener

Q. [ASK TO SPEAK TO ADULT IN THE HOUSEHOLD]

Hello, my name is <interviewer name> and we're calling on behalf of the College of St. Catherine in St. Paul. We are not selling anything, we are conducting a statewide research study about the environment. Your opinions are important to us but participation is voluntary and all your answers will be kept confidential.

If you want information about the study, I will give you an 800 # at the end of our conversation today that you can call. [IF ASKED: THE INTERVIEW WILL TAKE ABOUT 15 MINUTES DEPENDING ON YOUR RESPONSES]

QA. Are you at least 18 years of age?
Yes [CONTINUE]
No [ASK TO SPEAK TO PERSON 18 OR OLDER, IF NONE, TERMINATE AND RECORD]

QB. For this survey, I'd like to speak to the person in your household, 18 years of age or older, who has had the last (i.e. most recent) birthday. Are you that person?
Yes [CONTINUE]
No [ASK TO SPEAK TO PERSON 18 OR OLDER, WHO CELEBRATED THE LAST BIRTHDAY]

ASK IF 'NO' TO QB.
QBB. This research technique helps to ensure that we gather opinions from a random sample of people. May I please have the first name of the person with the most recent birthday so we can ask for them directly when we call back?
Yes [UPDATE CALLING RECORD WITH NAME OF PERSON]
No [NQB]

Q1. To begin I am going to read you a list of different environmental topics and ask how much do you feel you know about each. Please use a 5-point scale where 1 means A lot and 5 means Nothing at all. You may use any number from 1 to 5. How much would you say you know about |Insert first item|?
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know
ROTATE
[READ LIST, REPEAT SCALE AS NECESSARY]
a. Environmental problems
b. Air pollution
c. Energy issues
d. Water quality
e. Global warming

Q2. Next I am going to ask you some questions about environmental laws and regulations. For each of the following please tell me how familiar you are with the laws and regulations concerning the topic. Use a 5-point scale where 1 means Very familiar and 5 means Not at all familiar. How familiar are you with the laws and regulations concerning |INSERT FIRST ITEM|.

11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

ROTATE [READ LIST, REPEAT SCALE AS NECESSARY]

a. Air pollution
b. Water pollution
c. Chemicals in your food
d. Land development
e. Energy conservation and energy efficiency
f. Global warming

ROTATE Q3 through Q8 SAME ORDER AS Q2

Q3. At the present time, do you think existing laws and regulations preventing air pollution have gone too far, not far enough, or have struck about the right balance?

1. Gone too far
2. Not far enough
3. Struck about the right balance
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q4. At the present time do you think laws and regulations preventing water pollution have gone too far, not far enough, or have struck about the right balance?

1. Gone too far
2. Not far enough
3. Struck about the right balance
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q5. At the present time do you think laws and regulations regulating chemicals in your food have gone too far, not far enough, or have struck about the right balance?

1. Gone too far
2. Not far enough
3. Struck about the right balance
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q6. At the present time do you think laws and regulations controlling land development in your local area have gone too far, not far enough, or have struck about the right balance?

1. Gone too far
2. Not far enough
3. Struck about the right balance
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q7. At the present time do you think laws and regulations on energy conservation and energy efficiency have gone too far, not far enough, or have struck about the right balance?

1. Gone too far
2. Not far enough
3. Struck about the right balance
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q8. At the present time do you think laws and regulations on global warming have gone too far, not far enough, or have struck about the right balance?

1. Gone too far
2. Not far enough
3. Struck about the right balance
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

ROTATE Q9 through Q16

Q. The next group of questions is about issues that have been covered in the media in the past couple of years. Media includes television, newspapers, magazines, internet and other sources. Each question has four or five possible answers. If you don't know the answer, you can just state that you don't know. First

Q9. What is the most common cause of pollution of streams, rivers and oceans? Is it…

ROTATE
[READ LIST]
1. Sewage from treatment plants,
2. Surface water running off yards, city streets, paved lots, and farm fields,**
3. Oil from boats, or
4. Waste from factories
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

*** U.S. Environmental Protection Agency, EPA841-F-96-004A: http://www.epa.gov/OWOW/NPS/facts/point1.htm*

Q10. The Twin Cities area has had a number of air pollution alerts in the past few years, partially due to smog. What is the primary source of this smog? Is it…

ROTATE
[READ LIST]
1. Power plants,
2. The exhaust of motor vehicles,**
3. Waste incinerators, or
4. Smoke from fireplaces
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

*** Minnesota Pollution Control Agency site: http://www.pca.state.mn.us/publications/reports/ozonestudy2002.pdf, (p. 40)*

Q11. Mercury from air pollution is a health concern in lakes because it settles out of the air into water. What is the largest source of mercury in Minnesota's air?

ROTATE
[READ LIST]
1. Coal-burning power plants,**
2. Exhaust from motor vehicles,
3. Burning of batteries in incinerators, or
4. Smoke from fireplaces
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

***Minnesota Pollution Control Agency site: http://www.pca.state.mn.us/publications/reports/mercury-emissionsreport-0304.pdf (p. 20)*

Q12. The Minnesota Pollution Control Agency defines global warming as "an increase in the Earth's temperature caused by human activities….which release…greenhouse gases into the atmosphere." Which of the following is a common greenhouse gas?

ROTATE
[READ LIST]
1. Sulfur dioxide
2. Carbon dioxide**
3. Nitrogen or
4. Hydrogen
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

*** Minnesota Pollution Control Agency site: http://www.pca.state.mn.us/climatechange/#causes*

Q13. All of the activities listed here are contributors of human-caused greenhouse gases in Minnesota. Which of the following is the LARGEST contributor to greenhouse gas emissions in Minnesota?

ROTATE
[READ LIST]
1. Agricultural operations
2. Leakage from refrigeration systems
3. Burning fossil fuels (COAL, OIL, GASOLINE, DIESEL AND NATURAL GAS),** or
4. Gases released from landfills
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q14. What is the MOST common reason that an animal species becomes extinct? Is it because….

ROTATE
[READ LIST]
1. Pesticides are killing them
2. Their habitats are being destroyed by humans**
3. There is too much hunting, or
4. There are climate changes that affect them
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

***Global Environment: http://www.admwebstudios.co.uk/Biodiversity3.htm*
*** Biodiversity and Conservation: A Hypertext Book by Peter J. Bryant http://darwin.bio.uci.edu/~sustain/bio65/lec01/b65lec01.htm*

Q15. What is one of the MAIN benefits of wetlands? Do they…

ROTATE
[READ LIST]
1. Help to control global climate change
2. Help filter and store water before it enters lakes, streams, rivers or oceans**
3. Prevent the spread of undesirable plants and animals, or
4. Provide good sites for landfills
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Minnesota Department of Natural Resources: http://www.dnr.state.mn.us/wetlands/benefits.html

Q16. Where does MOST of the garbage in Minnesota go? Would you say…

ROTATE

[READ LIST]

1. Landfills
2. Waste to energy incinerators
3. Burn barrels
4. Recycling centers**, or
5. Compost facilities
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

***Minnesota Pollution control Agency: Report on 2006 SCORE Programs. A summary of waste management in Minnesota December 2007. Available at http://www.pca.state.mn.us/oea/lc/score06.cfm*

Q17. The next few questions are about energy. If you do not know the answer, you can just state that you don't know. Thinking about Minnesota, which of the following uses the most energy in people's homes? Is it…

ROTATE

[READ LIST]

1. Lighting rooms
2. Heating rooms**
3. Cooling rooms,
4. Heating water, or
5. Refrigerating food
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

***Energy Information Administration: http://apps1.eere.energy.gov/states/residential.cfm/state=MN#ng*

Q18. In the past ten years, has the fuel efficiency of vehicles in the U.S…

ROTATE

[READ LIST]

1. Increased
2. Remained the same**
3. Decreased
4. Not been tracked
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

***National Highway Traffic Safety Administration: http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.d0b5a45b55bfbe582f57529cdba046a0/*

Q19. Which of the following do you think energy experts say is the fastest and most cost-effective way to address our overall energy needs? Would you say…

ROTATE

[READ LIST]

1. Develop all possible domestic sources of oil and gas
2. Build more nuclear power plants
3. Build more hydroelectric power plants, or
4. Become more energy efficient?**
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Natural Resources Defense Council: http://docs.nrdc.org/globalWarming/files/glo_07052402a.pdf

Q20. Thinking about Minnesota, how is MOST of the electricity used in Minnesota generated? Is it…

ROTATE [READ LIST]

1. With fossil fuels (such as coal)**
2. With nuclear power
3. With wind energy, or
4. With hydro power
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Minnesota Pollution Control Agency: http://www.pca.state.mn.us/programs/electricity.html

Q21. In Minnesota, what do we do with nuclear waste now? Do we…..

ROTATE [READ LIST]

1. Reuse it as nuclear fuel
2. Send it to another state for storage
3. Dump it in landfills, or
4. Monitor it at the nuclear power plant**
10. [DO NOT READ] Other
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

***Energy Information Administration:* http://www.eia.doe.gov/cneaf/nuclear/page/at_a_glance/states/statesmn.html

Q22. Which of the following do you think is the BEST way to address America's energy needs?

ROTATE [READ LIST]

1. Drilling for more oil and gas in the US.
2. Developing renewable forms of energy (If necessary: SUCH AS WIND AND SOLAR)
3. Expanding nuclear power capabilities
4. Using coal more effectively
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

ASK IF 'YES' TO Q22a

Q22b. Does this include drilling on public lands such as national forests, wildlife refuges, national grasslands, etc.?

1. Yes
2. No
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q23. Do you think environmental education should be provided in our schools?

1. Yes
2. No
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

ASK IF 'YES' TO Q23

Q23b. Do you feel MOST of the funds for environmental education should come from…

[READ LIST]

1. Parents
2. Businesses
3. Schools
4. A state fund
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q24. People get information about the environment in a variety of ways. Please tell me how much you use each of the following ways to get environmental information. Use a 5-point scale where 1 means Use a lot and 5 means Do not use at all. You may use any number from 1 to 5.

11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know. How much do you use…

ROTATE
[READ LIST, REPEAT SCALE AS NECESSARY]

a. Internet
b. Newspapers—hardcopy or online
c. Magazines—hardcopy or online
d. Television
e. Radio
f. Conversations with friends or neighbors
g. Conservations with children about their environmental learning experiences

Q25. Now, different sources may provide varying amounts of environmental information. From each of the following sources please tell me how much environmental information you get. Use a five-point scale where 1 means Get a lot and 5 means Get none at all. You may use any number from 1 to 5.

11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

[READ LIST, REPEAT SCALE AS NECESSARY]

a. Government agencies (STATE OR FEDERAL)
b. Conservation or environmental groups
c. Environmental learning centers, including nature centers, parks, science museums, and zoos?
d. Scientific experts

Q25e. Are there any other sources from which you get environmental information?

1. Yes
2. No

Q25ee. What are these other sources?

Q26. Now, I would like to ask you about some of the things you may or may not do in your day-to-day life. Would you please tell me how often you do each of the following. Use a 5-point scale where 1 means Almost always do it and 5 means Never do it. You may use any number from 1 to 5. If it does not apply to you, please tell me.

11. [DO NOT READ] Refused
13. [DO NOT READ] Not applicable

First, how often do you…

ROTATE
[READ LIST, REPEAT SCALE AS NECESSARY]

a. Recycle things such as newspapers, cans, and glass
b. Turn off lights and electrical appliances when not in use or when you leave the room
c. Bike or walk to work
d. Use the bus
e. Carpool with others
f. Purchase lamps, light-bulbs and appliances that are energy efficient
g. Run air conditioner less often in the summer
h. Lower the thermostat in the winter
i. Accelerate slowly when driving
j. Donate money annually to an environmental group or organization
k. Buy organic foods on a regular basis
l. Buy locally-grown foods on a regular basis

[ASK IF '4' OR HIGHER IN Q27]
Q26b. You mentioned that you donate money annually to an environmental group or organization. Can you estimate how much you annually donate to them?
[ACCEPT NUMERIC TO NEAREST DOLLAR]
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q27. Please tell me how important each of the following is to you in deciding where you live? Use a 5-point scale where 1 means Very Important and 5 means Not at all important. You may use any number from 1 to 5.
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know
How important is |Insert|? [READ LIST]
a. Quality of schools.
b. Personal safety
c. Property taxes
d. Distance to work
e. Community spaces, such as parks and natural areas?
f. Living on a larger lot

Demographics

Q28. Lastly I have just a few questions to make sure we interview a representative cross-section of Minnesota residents. First, in what year were you born?
11. Refused

Q29. What is the highest level of education that you have completed? [READ LIST]
1. Less than a high school diploma
2. High school grad or GED
3. 2-year degree (AA, AS, professional school if two-year degree)
4. Some college
5. College graduate (4 year degree, BA, BS)
6. Graduate degree (Masters, MA, MS, MD, PhD, etc)
11. [DO NOT READ] Refused
12. [DO NOT READ] Don't know

Q30. To make sure we have talked with a variety of people, in which Minnesota county do you currently live? [RECORD COUNTY]

Q31. What racial or ethnic group best describes you? [DO NOT READ LIST]
1. African American
2. American Indian
3. Asian, Asian American, or Pacific Islander
4. White or Caucasian
5. Hispanic, Latino, or Spanish origin
6. Biracial or multiracial
7. Some other group, specify
11. Refused

Q31b. Other—What racial or ethnic group best describes you?

Q32. How many hours per week do you spend outside not including time spent for your employment? [DO NOT READ LIST, SELECT RANGE]

1. None
2. Fewer than 5 hours
3. 5 – 10 hours
4. 11 – 15 hours
5. 16 – 20 hours
6. 21 – 30 hours
7. 31 – 40 hours
8. More than 40 hours
11. Refused
12. Don't know

Q33. For statistical purposes, it would be helpful to know the income group which comes closest to your total annual household income for 2007. This is the total household income for all members of the household, from all sources of income, before taxes. I am going to read some broad ranges. Please stop me when I read the correct range.[READ LIST]

1. $15,000 or less
2. Greater than $15,000 to $30,000
3. Greater than $30,000 to $50,000
4. Greater than $50,000 to $75,000
5. Greater than $75,000 to $100,000, or
6. Over $100,000
11. [DO NOT READ] Refused

Q34. Record gender. [ASK ONLY IF UNCERTAIN]

1. Male
2. Female

Q35. In case my supervisor needs to verify my work, please tell me your first name?

Q36. Thank you very much for helping with this important study! That's all of the questions I have. [IF ASKED FOR INFORMATION, QUESTIONS AND CONCERNS ABOUT THE SURVEY, CALL THE COLLEGE OF ST. CATHERINE AT 1-800-945-4599 AND ASK FOR DR. TONY MURPHY]

Appendix B
Methodology

Consistent with past report card surveys, the current survey used a random-digit dial sample and randomized selection within the household. Random-digit dialing ensures an equal probability of selection for all residential telephone numbers within a given locale – in this study the State of Minnesota. Randomized selection within the household further equalizes selection probabilities. Randomization was attained by selecting the adult in the household who had the most recent birthday. This respondent selection method is done at the start of the telephone interview and is based on the respondent accurately acknowledging which person in the household had a birthday last (or most recently).

Telephone numbers for the calling sample were purchased from Survey Sampling, Incorporated. Professionally trained interviewers conducted computer-assisted telephone interviews (CATI) at MarketLine Research's call center located near the University of Minnesota Minneapolis campus. Interviewing began on August 24, 2007, and continued through November 6, 2007. Interviewing was not conducted the week of Thanksgiving. Calls were made 9 a.m. to 9 p.m. Monday through Thursday, 9 a.m. to 7 p.m. Friday and noon to 5 p.m. Saturdays and Sundays. Average interview length was 16 minutes.

One thousand interviews were completed with adults throughout Minnesota. For a sample of this size, relative to the adult population of Minnesota (3,909,837 estimate by U.S. Census Bureau, 2006), the sampling error is plus or minus 3.1 percentage points for results with a 50/50 proportional split. That is, if response to a survey question resulted in 50 percent of the sample answering "yes" and 50 percent answering "no," it is very likely for a sampling of the entire population of Minnesota, the actual percentage of the population who give such answers would be somewhere between 46.9 and 53.1 percent. Sampling error is progressively smaller for results with uneven splits.

For the first time, the environmental literacy survey began with the use of a Tennessen warning, a commonly used disclaimer informing a potential survey respondent that participation in a study is voluntary. (*Your opinions are important to us, but participation is voluntary and all your answers will be kept confidential*). The use of such a statement does have an impact on survey response rate – lowering cooperation as seen in increased rates of refusal to participate or increased rates of participant termination during survey administration.

The industry-standard response rate (CASRO RR3) for the study was 39 percent, with a refusal rate of 48 percent.

Reported percentages throughout the report were rounded down if less than 0.5% and rounded up if greater than 0.5%.

Appendix C
Final Frequencies

Q1a. How much would you say you know about environmental issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	124	12.4	12.4	12.4
		310	31.0	31.0	43.4
		380	38.0	38.0	81.4
		131	13.1	13.1	94.5
	Nothing at all?	55	5.5	5.5	100.0
	Total	1000	100.0	100.0	

Q1b. How much would you say you know about air pollution?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	115	11.5	11.5	11.5
		302	30.2	30.2	41.7
		373	37.3	37.3	79.0
		160	16.0	16.0	95.0
	Nothing at all?	50	5.0	5.0	100.0
	Total	1000	100.0	100.0	

Q1c. How much would you say you know about energy issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	139	13.9	13.9	13.9
		302	30.2	30.3	44.2
		344	34.4	34.5	78.7
		157	15.7	15.7	94.4
	Nothing at all?	56	5.6	5.6	100.0
	Total	998	99.8	100.0	
Missing	System	2	.2		
Total		1000	100.0		

Q1d. How much would you say you know about water quality?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	135	13.5	13.5	13.5
		287	28.7	28.7	42.2
		347	34.7	34.7	77.0
		167	16.7	16.7	93.7
	Nothing at all?	63	6.3	6.3	100.0
	Total	999	99.9	100.0	
Missing	System	1	.1		
Total		1000	100.0		

Q1e. How much would you say you know about global warming?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A lot	149	14.9	15.0	15.0
		290	29.0	29.1	44.1
		318	31.8	31.9	76.0
		167	16.7	16.8	92.8
	Nothing at all?	72	7.2	7.2	100.0
	Total	996	99.6	100.0	
Missing	System	4	.4		
Total		1000	100.0		

Q2a. How familiar are you with the laws and regulations concerning air pollution?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very familiar	50	5.0	5.0	5.0
		202	20.2	20.2	25.2
		350	35.0	35.0	60.2
		245	24.5	24.5	84.7
	Not at all Familiar?	153	15.3	15.3	100.0
	Total	1000	100.0	100.0	

Q2b. How familiar are you with the laws and regulations concerning water pollution?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very familiar	87	8.7	8.7	8.7
		205	20.5	20.5	29.2
		341	34.1	34.1	63.3
		235	23.5	23.5	86.8
	Not at all Familiar?	132	13.2	13.2	100.0
	Total	1000	100.0	100.0	

Q2c. How familiar are you with the laws and regulations concerning chemicals in your food?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very familiar	89	8.9	8.9	8.9
		169	16.9	16.9	25.8
		302	30.2	30.2	56.0
		243	24.3	24.3	80.3
	Not at all Familiar?	196	19.6	19.6	99.9
	[DO NOT READ] Don't know	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Q2d. How familiar are you with the laws and regulations concerning land development?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very familiar	88	8.8	8.8	8.8
		189	18.9	18.9	27.7
		273	27.3	27.3	55.0
		203	20.3	20.3	75.3
	Not at all Familiar?	247	24.7	24.7	100.0
	Total	1000	100.0	100.0	

Q2e. How familiar are you with the laws and regulations concerning energy conservation and energy efficiency?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very familiar	84	8.4	8.4	8.4
		228	22.8	22.8	31.2
		325	32.5	32.5	63.7
		225	22.5	22.5	86.2
	Not at all Familiar?	137	13.7	13.7	99.9
	[DO NOT READ] Don't know	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Q2f. How familiar are you with the laws and regulations concerning global warming?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very familiar	72	7.2	7.2	7.2
		161	16.1	16.1	23.3
		297	29.7	29.7	53.0
		243	24.3	24.3	77.3
	Not at all Familiar?	222	22.2	22.2	99.5
	[DO NOT READ] Refused	3	.3	.3	99.8
	[DO NOT READ] Don't know	2	.2	.2	100.0
	Total	1000	100.0	100.0	

Q3. At the present time, do you think existing laws and regulations preventing air pollution have...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gone too far	48	4.8	4.8	4.8
	Not far enough	621	62.1	62.1	66.9
	Struck about the right balance	292	29.2	29.2	96.1
	[DO NOT READ] Don't know	39	3.9	3.9	100.0
	Total	1000	100.0	100.0	

Q4. At the present time do you think laws and regulations preventing water pollution have...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gone too far	35	3.5	3.5	3.5
	Not far enough	664	66.4	66.4	69.9
	Struck about the right balance	275	27.5	27.5	97.4
	[DO NOT READ] Don't know	26	2.6	2.6	100.0
	Total	1000	100.0	100.0	

Q5. At the present time do you think laws and regulations regulating chemicals in your food have...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gone too far	52	5.2	5.2	5.2
	Not far enough	595	59.5	59.5	64.7
	Struck about the right balance	308	30.8	30.8	95.5
	[DO NOT READ] Don't know	45	4.5	4.5	100.0
	Total	1000	100.0	100.0	

Q6. At the present time do you think laws and regulations controlling land development in your local area have...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gone too far	186	18.6	18.6	18.6
	Not far enough	278	27.8	27.8	46.4
	Struck about the right balance	471	47.1	47.1	93.5
	[DO NOT READ] Refused	1	.1	.1	93.6
	[DO NOT READ] Don't know	64	6.4	6.4	100.0
	Total	1000	100.0	100.0	

Q7. At the present time do you think laws and regulations on energy conservation and energy efficiency have...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gone too far	64	6.4	6.4	6.4
	Not far enough	591	59.1	59.1	65.5
	Struck about the right balance	307	30.7	30.7	96.2
	[DO NOT READ] Refused	1	.1	.1	96.3
	[DO NOT READ] Don't know	37	3.7	3.7	100.0
	Total	1000	100.0	100.0	

Q8. At the present time do you think laws and regulations on global warming have...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gone too far	117	11.7	11.7	11.7
	Not far enough	636	63.6	63.6	75.3
	Struck about the right balance	187	18.7	18.7	94.0
	[DO NOT READ] Refused	4	.4	.4	94.4
	[DO NOT READ] Don't know	56	5.6	5.6	100.0
	Total	1000	100.0	100.0	

Q9. What is the most common cause of pollution of streams, rivers and oceans?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sewage from treatment plants,	77	7.7	7.7	7.7
	Surface water running off yards, city streets, paved lots,	610	61.0	61.0	68.7
	Oil from boats, or	28	2.8	2.8	71.5
	Waste from factories	163	16.3	16.3	87.8
	[DO NOT READ] Other	6	.6	.6	88.4
	[DO NOT READ] Refused	3	.3	.3	88.7
	[DO NOT READ] Don't know	113	11.3	11.3	100.0
	Total	1000	100.0	100.0	

Q10. The Twin Cities area has had a number of air pollution alerts in the past few years, partially due to smog. What is the primary source of this smog?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Power plants,	78	7.8	7.8	7.8
	The exhaust of motor vehicles, [C]	740	74.0	74.0	81.8
	Waste incinerators, or	30	3.0	3.0	84.8
	Smoke from fireplaces	6	.6	.6	85.4
	[DO NOT READ] Other	8	.8	.8	86.2
	[DO NOT READ] Don't know	138	13.8	13.8	100.0
	Total	1000	100.0	100.0	

Q11. Mercury from air pollution is a health concern in lakes because it settles out of the air into water. What is the largest source of mercury in Minnesota's air?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Coal-burning power plants, [C]	269	26.9	26.9	26.9
	Exhaust from motor vehicles,	175	17.5	17.5	44.4
	Burning of batteries in incinerators, or	123	12.3	12.3	56.7
	Smoke from fireplaces	7	.7	.7	57.4
	[DO NOT READ] Other	5	.5	.5	57.9
	[DO NOT READ] Don't know	421	42.1	42.1	100.0
	Total	1000	100.0	100.0	

Q12. The Minnesota Pollution Control Agency defines global warming as "an increase in the Earth's temperature caused by human activities which release greenhouse gasses into the atmosphere." Which of the following is a common greenhouse gas?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sulfur dioxide	104	10.4	10.4	10.4
	Carbon dioxide [C]	541	54.1	54.1	64.5
	Nitrogen or	30	3.0	3.0	67.5
	Hydrogen	8	.8	.8	68.3
	[DO NOT READ] Other	4	.4	.4	68.7
	[DO NOT READ] Refused	1	.1	.1	68.8
	[DO NOT READ] Don't know	312	31.2	31.2	100.0
	Total	1000	100.0	100.0	

Q13. All of the activities listed here are contributors of human-caused greenhouse gasses in Minnesota. Which of the following is the LARGEST contributor to greenhouse gas emissions in Minnesota?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agricultural operations	103	10.3	10.3	10.3
	Leakage from refrigeration systems	21	2.1	2.1	12.4
	Burning fossil fuels (COAL, OIL, GASOLINE, DIESEL AND NATURA	509	50.9	50.9	63.3
	Gases released from landfills	87	8.7	8.7	72.0
	[DO NOT READ] Other	6	.6	.6	72.6
	[DO NOT READ] Refused	1	.1	.1	72.7
	[DO NOT READ] Don't know	273	27.3	27.3	100.0
	Total	1000	100.0	100.0	

Q14. What is the MOST common reason that an animal species becomes extinct? Is it because...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pesticides are killing them	45	4.5	4.5	4.5
	Their habitats are being destroyed by humans [C]	695	69.5	69.5	74.0
	There is too much hunting, or	26	2.6	2.6	76.6
	There are climate changes that affect them	117	11.7	11.7	88.3
	[DO NOT READ] Other	16	1.6	1.6	89.9
	[DO NOT READ] Refused	3	.3	.3	90.2
	[DO NOT READ] Don't know	98	9.8	9.8	100.0
	Total	1000	100.0	100.0	

Q15. What is one of the MAIN benefits of wetlands? Do they...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Help to control global climate change	107	10.7	10.7	10.7
	Help filter and store water before it enters lakes, streams,	627	62.7	62.7	73.4
	Prevent the spread of undesirable plants and animals, or	27	2.7	2.7	76.1
	Provide good sites for landfills	19	1.9	1.9	78.0
	[DO NOT READ] Other	7	.7	.7	78.7
	[DO NOT READ] Refused	1	.1	.1	78.8
	[DO NOT READ] Don't know	212	21.2	21.2	100.0
	Total	1000	100.0	100.0	

Q16. Where does MOST of the garbage in Minnesota go? Would you say...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Landfills	727	72.7	72.7	72.7
	Waste to energy incinerators	75	7.5	7.5	80.2
	Burn barrels	9	.9	.9	81.1
	Recycling centers, or [C]	52	5.2	5.2	86.3
	Compost facilities	36	3.6	3.6	89.9
	[DO NOT READ] Refused	1	.1	.1	90.0
	[DO NOT READ] Don't know	100	10.0	10.0	100.0
	Total	1000	100.0	100.0	

Q17. Thinking about Minnesota, which of the following uses the most energy in people's homes? Is it...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lighting rooms	73	7.3	7.3	7.3
	Heating rooms [C]	422	42.2	42.2	49.5
	Cooling rooms	186	18.6	18.6	68.1
	Heating water, or	68	6.8	6.8	74.9
	Refrigerating food	43	4.3	4.3	79.2
	[DO NOT READ] Other	1	.1	.1	79.3
	[DO NOT READ] Don't know	207	20.7	20.7	100.0
	Total	1000	100.0	100.0	

Q18. In the past ten years, has the fuel efficiency of vehicles in the U.S...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increased	485	48.5	48.5	48.5
	Remained the same [C]	240	24.0	24.0	72.5
	Decreased	142	14.2	14.2	86.7
	Not been tracked	37	3.7	3.7	90.4
	[DO NOT READ] Don't know	96	9.6	9.6	100.0
	Total	1000	100.0	100.0	

Q19. Which of the following do you think energy experts say is the fastest and most cost-effective way to address our overall energy needs? Would you say...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Develop all possible domestic sources of oil and gas	90	9.0	9.0	9.0
	Build more nuclear power plants	107	10.7	10.7	19.7
	Build more hydroelectric power plants, or	55	5.5	5.5	25.2
	Become more energy efficient? [C]	604	60.4	60.4	85.6
	[DO NOT READ] Other	14	1.4	1.4	87.0
	[DO NOT READ] Refused	1	.1	.1	87.1
	[DO NOT READ] Don't know	129	12.9	12.9	100.0
	Total	1000	100.0	100.0	

Q20. Thinking about Minnesota, how is MOST of the electricity used in Minnesota generated?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	With fossil fuels (such as coal) [C]	561	56.1	56.1	56.1
	With nuclear power	133	13.3	13.3	69.4
	With wind energy, or	23	2.3	2.3	71.7
	With hydro power	67	6.7	6.7	78.4
	[DO NOT READ] Other	1	.1	.1	78.5
	[DO NOT READ] Don't know	215	21.5	21.5	100.0
	Total	1000	100.0	100.0	

Q21. In Minnesota, what do we do with nuclear waste now?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Reuse it as nuclear fuel	39	3.9	3.9	3.9
	Send it to another state for storage	274	27.4	27.4	31.3
	Dump it in landfills, or	35	3.5	3.5	34.8
	Monitor it at the nuclear power plant [C]	272	27.2	27.2	62.0
	[DO NOT READ] Other	3	.3	.3	62.3
	[DO NOT READ] Don't know	377	37.7	37.7	100.0
	Total	1000	100.0	100.0	

Q22. Which of the following do you think is the BEST way to address America's energy needs?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Drilling for more oil and gas in the US.	83	8.3	8.3	8.3
	Developing renewable forms of energy	674	67.4	67.4	75.7
	Expanding nuclear power capabilities	89	8.9	8.9	84.6
	Using coal more effectively	70	7.0	7.0	91.6
	[DO NOT READ] Refused	4	.4	.4	92.0
	[DO NOT READ] Don't know	80	8.0	8.0	100.0
	Total	1000	100.0	100.0	

Q22b. Does this include drilling on public lands such as national forests, wildlife refuges, national grasslands, etc.?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	59	5.9	71.1	71.1
	No	19	1.9	22.9	94.0
	[DO NOT READ] Don't know	5	.5	6.0	100.0
	Total	83	8.3	100.0	
Missing	-1	917	91.7		
Total		1000	100.0		

Q23. Do you think environmental education should be provided in our schools?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	926	92.6	92.6	92.6
	No	58	5.8	5.8	98.4
	[DO NOT READ] Refused	5	.5	.5	98.9
	[DO NOT READ] Don't know	11	1.1	1.1	100.0
	Total	1000	100.0	100.0	

Q23b. Do you feel MOST of the funds for environmental education should come from...

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Parents	48	4.8	5.2	5.2
	Businesses	133	13.3	14.4	19.5
	Schools	99	9.9	10.7	30.2
	A state fund	587	58.7	63.4	93.6
	[DO NOT READ] Refused	5	.5	.5	94.2
	[DO NOT READ] Don't know	54	5.4	5.8	100.0
	Total	926	92.6	100.0	
Missing	-1	74	7.4		
Total		1000	100.0		

People get information about the environment in a variety of ways. Please tell me how much you use each of the following ways to get environmental information.
Q24a. How much do you use internet?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use a lot	137	13.7	13.7	13.7
		135	13.5	13.5	27.2
		185	18.5	18.5	45.7
		131	13.1	13.1	58.8
	Do not use at all	407	40.7	40.7	99.5
	[DO NOT READ] Refused	1	.1	.1	99.6
	[DO NOT READ] Don't know	4	.4	.4	100.0
	Total	1000	100.0	100.0	

Q24b. How much do you use newspapers- either online or hardcopy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use a lot	240	24.0	24.0	24.0
		244	24.4	24.4	48.4
		246	24.6	24.6	73.0
		112	11.2	11.2	84.2
	Do not use at all	157	15.7	15.7	99.9
	[DO NOT READ] Don't know	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Q24c. How much do you use magazines- either online or hardcopy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use a lot	124	12.4	12.4	12.4
		187	18.7	18.7	31.1
		225	22.5	22.5	53.6
		199	19.9	19.9	73.5
	Do not use at all	260	26.0	26.0	99.5
	[DO NOT READ] Don't know	5	.5	.5	100.0
	Total	1000	100.0	100.0	

Q24d. How much do you use television?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use a lot	249	24.9	24.9	24.9
		238	23.8	23.8	48.7
		267	26.7	26.7	75.4
		151	15.1	15.1	90.5
	Do not use at all	92	9.2	9.2	99.7
	[DO NOT READ] Don't know	3	.3	.3	100.0
	Total	1000	100.0	100.0	

Q24e. How much do you use radio?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use a lot	119	11.9	11.9	11.9
		193	19.3	19.3	31.2
		218	21.8	21.8	53.0
		194	19.4	19.4	72.4
	Do not use at all	275	27.5	27.5	99.9
	[DO NOT READ] Don't know	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Q24f. How much do you use conversations with friends or neighbors?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use a lot	97	9.7	9.7	9.7
		204	20.4	20.4	30.1
		332	33.2	33.2	63.3
		217	21.7	21.7	85.0
	Do not use at all	149	14.9	14.9	99.9
	[DO NOT READ] Don't know	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Q24g. How much do you use conversations with children about their environmental learning experiences?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Use a lot	68	6.8	6.8	6.8
		97	9.7	9.7	16.5
		193	19.3	19.3	35.8
		206	20.6	20.6	56.4
	Do not use at all	432	43.2	43.2	99.6
	[DO NOT READ] Refused	1	.1	.1	99.7
	[DO NOT READ] Don't know	3	.3	.3	100.0
	Total	1000	100.0	100.0	

Q25a. How much environmental information do you get from government agencies (state or federal)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Get a lot	60	6.0	6.0	6.0
		117	11.7	11.7	17.7
		260	26.0	26.0	43.7
		260	26.0	26.0	69.7
	Get none at all	302	30.2	30.2	99.9
	[DO NOT READ] Refused	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Q25b. How much environmental information do you get from conservation or environmental groups?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Get a lot	123	12.3	12.3	12.3
		205	20.5	20.5	32.8
		247	24.7	24.7	57.5
		199	19.9	19.9	77.4
	Get none at all	225	22.5	22.5	99.9
	[DO NOT READ] Don't know	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Q25c. How much environmental information do you get from environmental learning centers, including nature centers, parks, science museums and zoos?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Get a lot	84	8.4	8.4	8.4
		179	17.9	17.9	26.3
		273	27.3	27.3	53.6
		235	23.5	23.5	77.1
	Get none at all	229	22.9	22.9	100.0
	Total	1000	100.0	100.0	

Q25d. How much environmental information do you get from scientific experts?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Get a lot	77	7.7	7.7	7.7
		177	17.7	17.7	25.4
		199	19.9	19.9	45.3
		181	18.1	18.1	63.4
	Get none at all	359	35.9	35.9	99.3
	[DO NOT READ] Don't know	7	.7	.7	100.0
	Total	1000	100.0	100.0	

Q25e. Are there any other sources from which you get environmental information?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	208	20.8	20.8	20.8
	No	792	79.2	79.2	100.0
	Total	1000	100.0	100.0	

Q26a. How often do you recycle things, such as newspapers, cans, and glass?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	749	74.9	74.9	74.9
		99	9.9	9.9	84.8
		71	7.1	7.1	91.9
		34	3.4	3.4	95.3
	Never do it	47	4.7	4.7	100.0
	Total	1000	100.0	100.0	

Q26b. How often do you turn off the lights and electrical appliances when not in use or when you leave the room?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	684	68.4	68.4	68.4
		218	21.8	21.8	90.2
		52	5.2	5.2	95.4
		23	2.3	2.3	97.7
	Never do it	22	2.2	2.2	99.9
	[DO NOT READ] Not applicable	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Q26c. How often do you bike or walk to work?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	74	7.4	7.4	7.4
		40	4.0	4.0	11.4
		56	5.6	5.6	17.0
		65	6.5	6.5	23.5
	Never do it	616	61.6	61.6	85.1
	[DO NOT READ] Refused	2	.2	.2	85.3
	[DO NOT READ] Not applicable	147	14.7	14.7	100.0
	Total	1000	100.0	100.0	

Q26d. How often do you use the bus?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	45	4.5	4.5	4.5
		17	1.7	1.7	6.2
		25	2.5	2.5	8.7
		69	6.9	6.9	15.6
	Never do it	735	73.5	73.5	89.1
	[DO NOT READ] Not applicable	109	10.9	10.9	100.0
	Total	1000	100.0	100.0	

Q26e. How often do you carpool with others?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	69	6.9	6.9	6.9
		57	5.7	5.7	12.6
		115	11.5	11.5	24.1
		134	13.4	13.4	37.5
	Never do it	565	56.5	56.5	94.0
	[DO NOT READ] Not applicable	60	6.0	6.0	100.0
	Total	1000	100.0	100.0	

Q26f. How often do you purchase lamps, light bulbs and appliances that are energy efficient?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	366	36.6	36.6	36.6
		280	28.0	28.0	64.6
		189	18.9	18.9	83.5
		84	8.4	8.4	91.9
	Never do it	77	7.7	7.7	99.6
	[DO NOT READ] Refused	1	.1	.1	99.7
	[DO NOT READ] Not applicable	3	.3	.3	100.0
	Total	1000	100.0	100.0	

Q26g. How often do you run air conditioner less often in the summer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	296	29.6	29.6	29.6
		221	22.1	22.1	51.7
		235	23.5	23.5	75.2
		113	11.3	11.3	86.5
	Never do it	98	9.8	9.8	96.3
	[DO NOT READ] Refused	1	.1	.1	96.4
	[DO NOT READ] Not applicable	36	3.6	3.6	100.0
	Total	1000	100.0	100.0	

Q26h. How often do you lower the thermostat in the winter?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	451	45.1	45.1	45.1
		237	23.7	23.7	68.8
		174	17.4	17.4	86.2
		65	6.5	6.5	92.7
	Never do it	68	6.8	6.8	99.5
	[DO NOT READ] Not applicable	5	.5	.5	100.0
	Total	1000	100.0	100.0	

Q26i. How often do you accelerate slowly when driving?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	330	33.0	33.0	33.0
		235	23.5	23.5	56.5
		243	24.3	24.3	80.8
		86	8.6	8.6	89.4
	Never do it	91	9.1	9.1	98.5
	[DO NOT READ] Not applicable	15	1.5	1.5	100.0
	Total	1000	100.0	100.0	

Q26j. How often do you donate money annually to an environmental group or organization?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	150	15.0	15.0	15.0
		86	8.6	8.6	23.6
		188	18.8	18.8	42.4
		174	17.4	17.4	59.8
	Never do it	397	39.7	39.7	99.5
	[DO NOT READ] Not applicable	5	.5	.5	100.0
	Total	1000	100.0	100.0	

Q26k. How often do you buy organic foods on a regular basis?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	98	9.8	9.8	9.8
		113	11.3	11.3	21.1
		206	20.6	20.6	41.7
		218	21.8	21.8	63.5
	Never do it	363	36.3	36.3	99.8
	[DO NOT READ] Not applicable	2	.2	.2	100.0
	Total	1000	100.0	100.0	

Q26l. How often do you buy locally grown foods on a regular basis?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Almost always do it	171	17.1	17.1	17.1
		241	24.1	24.1	41.2
		333	33.3	33.3	74.5
		184	18.4	18.4	92.9
	Never do it	66	6.6	6.6	99.5
	[DO NOT READ] Refused	2	.2	.2	99.7
	[DO NOT READ] Not applicable	3	.3	.3	100.0
	Total	1000	100.0	100.0	

Q26bb. You mentioned that you donate money annually to an environmental group or organization. Can you estimate how much you annually donate to them?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	6	.6	1.2	1.2
	3	1	.1	.2	1.4
	5	8	.8	1.6	3.0
	10	17	1.7	3.4	6.4
	15	6	.6	1.2	7.6
	20	43	4.3	8.6	16.2
	25	46	4.6	9.2	25.4
	30	8	.8	1.6	27.0
	35	4	.4	.8	27.8
	40	10	1.0	2.0	29.8
	50	98	9.8	19.6	49.4
	60	1	.1	.2	49.6
	65	1	.1	.2	49.8
	75	7	.7	1.4	51.2
	80	2	.2	.4	51.6
	96	1	.1	.2	51.8
	100	105	10.5	21.0	72.8
	120	4	.4	.8	73.6
	125	1	.1	.2	73.8
	150	16	1.6	3.2	77.0
	160	1	.1	.2	77.2
	200	50	5.0	10.0	87.2
	250	7	.7	1.4	88.6
	300	12	1.2	2.4	91.0
	350	2	.2	.4	91.4
	400	2	.2	.4	91.8
	500	18	1.8	3.6	95.4
	600	3	.3	.6	96.0
	750	1	.1	.2	96.2
	800	2	.2	.4	96.6
	1000	7	.7	1.4	98.0
	1100	1	.1	.2	98.2
	1500	2	.2	.4	98.6
	2000	2	.2	.4	99.0
	3000	1	.1	.2	99.2
	4002	1	.1	.2	99.4
	5000	2	.2	.4	99.8
	10000	1	.1	.2	100.0
	Total	500	50.0	100.0	
Missing	-3	68	6.8		
	-2	30	3.0		
	-1	402	40.2		
	Total	500	50.0		
Total		1000	100.0		

Q27a. How important is quality of schools?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	584	58.4	58.4	58.4
		134	13.4	13.4	71.8
		84	8.4	8.4	80.2
		38	3.8	3.8	84.0
	Not at all important	156	15.6	15.6	99.6
	[DO NOT READ] Refused	1	.1	.1	99.7
	[DO NOT READ] Don't know	3	.3	.3	100.0
	Total	1000	100.0	100.0	

Q27b. How important is personal safety?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	729	72.9	72.9	72.9
		167	16.7	16.7	89.6
		63	6.3	6.3	95.9
		19	1.9	1.9	97.8
	Not at all important	22	2.2	2.2	100.0
	Total	1000	100.0	100.0	

Q27c. How important is property taxes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	387	38.7	38.7	38.7
		224	22.4	22.4	61.1
		257	25.7	25.7	86.8
		68	6.8	6.8	93.6
	Not at all important	59	5.9	5.9	99.5
	[DO NOT READ] Refused	2	.2	.2	99.7
	[DO NOT READ] Don't know	3	.3	.3	100.0
	Total	1000	100.0	100.0	

Q27d. How important is distance to work?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	283	28.3	28.3	28.3
		197	19.7	19.7	48.0
		221	22.1	22.1	70.1
		67	6.7	6.7	76.8
	Not at all important	196	19.6	19.6	96.4
	[DO NOT READ] Refused	17	1.7	1.7	98.1
	[DO NOT READ] Don't know	19	1.9	1.9	100.0
	Total	1000	100.0	100.0	

Q27e. How important is community spaces, such as parks and natural areas?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	375	37.5	37.5	37.5
		290	29.0	29.0	66.5
		206	20.6	20.6	87.1
		70	7.0	7.0	94.1
	Not at all important	58	5.8	5.8	99.9
	[DO NOT READ] Don't know	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Q27f. How important is living on a larger lot?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	288	28.8	28.8	28.8
		149	14.9	14.9	43.7
		207	20.7	20.7	64.4
		139	13.9	13.9	78.3
	Not at all important	211	21.1	21.1	99.4
	[DO NOT READ] Refused	1	.1	.1	99.5
	[DO NOT READ] Don't know	5	.5	.5	100.0
	Total	1000	100.0	100.0	

Q28b. Age category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 24	29	2.9	2.9	2.9
	25 - 44	265	26.5	26.5	29.4
	45 - 64	438	43.8	43.8	73.2
	65+	257	25.7	25.7	98.9
	Refused	11	1.1	1.1	100.0
	Total	1000	100.0	100.0	

Q28c. Age category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 34	126	12.6	12.6	12.6
	35 - 44	168	16.8	16.8	29.4
	45 - 64	438	43.8	43.8	73.2
	65+	257	25.7	25.7	98.9
	Refused	11	1.1	1.1	100.0
	Total	1000	100.0	100.0	

Q28d. Age category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 24	29	2.9	2.9	2.9
	25 - 34	97	9.7	9.7	12.6
	35 - 44	168	16.8	16.8	29.4
	45 - 54	231	23.1	23.1	52.5
	55 - 64	207	20.7	20.7	73.2
	65+	257	25.7	25.7	98.9
	Refused	11	1.1	1.1	100.0
	Total	1000	100.0	100.0	

Q29. What is the highest level of education that you have completed?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than a high school diploma	22	2.2	2.2	2.2
	High school grad or GED	230	23.0	23.0	25.2
	2-year degree (AA, AS, professional school if two-year degree	129	12.9	12.9	38.1
	Some college	207	20.7	20.7	58.8
	College graduate (4 year degree, BA, BS)	245	24.5	24.5	83.3
	Graduate degree (Masters, MA, MS, MD, PhD, etc)	166	16.6	16.6	99.9
	[DO NOT READ] Refused	1	.1	.1	100.0
	Total	1000	100.0	100.0	

Educational group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School or Less	252	25.2	25.2	25.2
	Some College	336	33.6	33.6	58.9
	With College Degree	411	41.1	41.1	100.0
	Total	999	99.9	100.0	
Missing	System	1	.1		
Total		1000	100.0		

Q30a. To make sure we have talked with a variety of people, in which Minnesota county do you currently live?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Aitkin	2	.2	.2	.2
	Anoka	50	5.0	5.0	5.2
	Becker	7	.7	.7	5.9
	Beltrami	9	.9	.9	6.8
	Benton	11	1.1	1.1	7.9
	Big Stone	1	.1	.1	8.0
	Blue Earth	8	.8	.8	8.8
	Brown	3	.3	.3	9.1
	Carlton	7	.7	.7	9.8
	Carver	20	2.0	2.0	11.8
	Cass	10	1.0	1.0	12.8
	Chippewa	4	.4	.4	13.2
	Chisago	18	1.8	1.8	15.0
	Clay	10	1.0	1.0	16.0
	Clearwater	2	.2	.2	16.2
	Cottonwood	1	.1	.1	16.3
	Crow Wing	8	.8	.8	17.1
	Dakota	79	7.9	7.9	25.0
	Dodge	3	.3	.3	25.3
	Douglas	9	.9	.9	26.2
	Faribault	3	.3	.3	26.5
	Fillmore	9	.9	.9	27.4
	Freeborn	9	.9	.9	28.3
	Goodhue	9	.9	.9	29.2
	Grant	2	.2	.2	29.4
	Hennepin	194	19.4	19.4	48.8
	Houston	3	.3	.3	49.1
	Hubbard	5	.5	.5	49.6
	Isanti	10	1.0	1.0	50.6
	Itasca	14	1.4	1.4	52.0
	Jackson	2	.2	.2	52.2
	Kanabec	6	.6	.6	52.8
	Kandiyohi	10	1.0	1.0	53.8
	Kittson	1	.1	.1	53.9
	Koochiching	5	.5	.5	54.4
	Lac Qui Parle	4	.4	.4	54.8
	Lake	3	.3	.3	55.1
	Le Sueur	12	1.2	1.2	56.3
	Lyon	3	.3	.3	56.6
	[M - Z]	434	43.4	43.4	100.0
	Total	1000	100.0	100.0	

Q30b. To make sure we have talked with a variety of people, in which Minnesota county do you currently live?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	McLeod	6	.6	1.4	1.4
	Marshall	3	.3	.7	2.1
	Martin	4	.4	.9	3.0
	Meeker	8	.8	1.8	4.8
	Mille Lacs	4	.4	.9	5.8
	Morrison	7	.7	1.6	7.4
	Mower	11	1.1	2.5	9.9
	Nicollet	7	.7	1.6	11.5
	Nobles	4	.4	.9	12.4
	Olmsted	31	3.1	7.1	19.6
	Otter Tail	10	1.0	2.3	21.9
	Pennington	4	.4	.9	22.8
	Pine	8	.8	1.8	24.7
	Pipestone	2	.2	.5	25.1
	Polk	2	.2	.5	25.6
	Pope	1	.1	.2	25.8
	Ramsey	74	7.4	17.1	42.9
	Red Lake	1	.1	.2	43.1
	Redwood	1	.1	.2	43.3
	Renville	3	.3	.7	44.0
	Rice	9	.9	2.1	46.1
	Rock	2	.2	.5	46.5
	Roseau	3	.3	.7	47.2
	Saint Louis	49	4.9	11.3	58.5
	Scott	22	2.2	5.1	63.6
	Sherburne	17	1.7	3.9	67.5
	Sibley	2	.2	.5	68.0
	Stearns	28	2.8	6.5	74.4
	Steele	10	1.0	2.3	76.7
	Stevens	2	.2	.5	77.2
	Todd	7	.7	1.6	78.8
	Wabasha	4	.4	.9	79.7
	Wadena	4	.4	.9	80.6
	Waseca	3	.3	.7	81.3
	Washington	53	5.3	12.2	93.5
	Watonwan	4	.4	.9	94.5
	Winona	6	.6	1.4	95.9
	Wright	15	1.5	3.5	99.3
	Yellow Medicine	3	.3	.7	100.0
	Total	434	43.4	100.0	
Missing	-1	566	56.6		
Total		1000	100.0		

Q30c. County classification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7 County Metro	492	49.2	49.2	49.2
	Other Metro	194	19.4	19.4	68.6
	Non-Metro	314	31.4	31.4	100.0
	Total	1000	100.0	100.0	

Q31. What racial or ethnic group best describes you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	African American	18	1.8	1.8	1.8
	American Indian	8	.8	.8	2.6
	Asian, Asian American, or Pacific Islander	1	.1	.1	2.7
	White or Caucasian	931	93.1	93.1	95.8
	Hispanic, Latino, or Spanish origin	5	.5	.5	96.3
	Biracial or multiracial	17	1.7	1.7	98.0
	Some other group, [SPECIFY]	6	.6	.6	98.6
	Refused	14	1.4	1.4	100.0
	Total	1000	100.0	100.0	

Q32. How many hours per week do you spend outside, not including time spent for your employment?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	6	.6	.6	.6
	Fewer than 5 hours	109	10.9	11.2	11.9
	5 - 10 hours	277	27.7	28.6	40.5
	11 - 15 hours	147	14.7	15.2	55.6
	16 - 20 hours	163	16.3	16.8	72.4
	21 - 30 hours	129	12.9	13.3	85.8
	31 - 40 hours	64	6.4	6.6	92.4
	More than 40 hours	74	7.4	7.6	100.0
	Total	969	96.9	100.0	
Missing	System	31	3.1		
Total		1000	100.0		

Q33. For statistical purposes, it would be helpful to know the income group which comes closest to your total annual household income for 2007. This is the total before taxes.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	$15,000 or less	62	6.2	6.9	6.9
	Greater than $15,000 to $30,000	141	14.1	15.7	22.6
	Greater than $30,000 to $50,000	195	19.5	21.7	44.2
	Greater than $50,000 to $75,000	205	20.5	22.8	67.0
	Greater than $75,000 to $100,000, or	128	12.8	14.2	81.2
	Over $100,000	169	16.9	18.8	100.0
	Total	900	90.0	100.0	
Missing	System	100	10.0		
Total		1000	100.0		

Q34. Record gender. [ASK ONLY IF UNCERTAIN]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	423	42.3	42.3	42.3
	Female	577	57.7	57.7	100.0
	Total	1000	100.0	100.0	

Combined knowledge, number correct

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7	.7	.7	.7
	1	33	3.3	3.3	4.0
	2	50	5.0	5.0	9.0
	3	86	8.6	8.6	17.6
	4	102	10.2	10.2	27.8
	5	126	12.6	12.6	40.4
	6	134	13.4	13.4	53.8
	7	138	13.8	13.8	67.6
	8	127	12.7	12.7	80.3
	9	97	9.7	9.7	90.0
	10	59	5.9	5.9	95.9
	11	28	2.8	2.8	98.7
	12	13	1.3	1.3	100.0
	Total	1000	100.0	100.0	

Combined environmental knowledge grade

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	278	27.8	27.8	27.8
	D	260	26.0	26.0	53.8
	C	265	26.5	26.5	80.3
	B	156	15.6	15.6	95.9
	A	41	4.1	4.1	100.0
	Total	1000	100.0	100.0	

Environmental knowledge, number correct

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	33	3.3	3.3	3.3
	1	66	6.6	6.6	9.9
	2	108	10.8	10.8	20.7
	3	173	17.3	17.3	38.0
	4	188	18.8	18.8	56.8
	5	183	18.3	18.3	75.1
	6	168	16.8	16.8	91.9
	7	81	8.1	8.1	100.0
	Total	1000	100.0	100.0	

Environmental knowledge grade

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A	81	8.1	8.1	8.1
	B	351	35.1	35.1	43.2
	C	188	18.8	18.8	62.0
	D	173	17.3	17.3	79.3
	F	207	20.7	20.7	100.0
	Total	1000	100.0	100.0	

Environmental knowledge without the waste question, number correct out of 7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	36	3.6	3.6	3.6
	1.00	76	7.6	7.6	11.2
	2.00	103	10.3	10.3	21.5
	3.00	175	17.5	17.5	39.0
	4.00	185	18.5	18.5	57.5
	5.00	183	18.3	18.3	75.8
	6.00	165	16.5	16.5	92.3
	7.00	77	7.7	7.7	100.0
	Total	1000	100.0	100.0	

Energy knowledge, number correct

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	85	8.5	8.5	8.5
	1	245	24.5	24.5	33.0
	2	313	31.3	31.3	64.3
	3	229	22.9	22.9	87.2
	4	99	9.9	9.9	97.1
	5	29	2.9	2.9	100.0
	Total	1000	100.0	100.0	

Energy knowledge grade

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	330	33.0	33.0	33.0
	D	313	31.3	31.3	64.3
	C	229	22.9	22.9	87.2
	B	99	9.9	9.9	97.1
	A	29	2.9	2.9	100.0
	Total	1000	100.0	100.0	

R4. Environmental attitudes (Q3 through Q8)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low (1.0-1.99)	88	8.8	10.3	10.3
	Medium (2.0-2.49)	199	19.9	23.3	33.6
	High (2.5-3.0)	566	56.6	66.4	100.0
	Total	853	85.3	100.0	
Missing	System	147	14.7		
Total		1000	100.0		

R5. Environmental behaviors (Q26a through Q26l)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low (1.0-2.99)	331	33.1	43.3	43.3
	Medium (3.0-3.49)	273	27.3	35.7	79.1
	High (3.5-5.0)	160	16.0	20.9	100.0
	Total	764	76.4	100.0	
Missing	System	236	23.6		
Total		1000	100.0		

R6. Self-reported knowledge (Q1a through Q1e)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low (1.0-2.99)	302	30.2	30.2	30.2
	Medium (3.0-3.49)	294	29.4	29.4	59.6
	High (3.5-5.0)	404	40.4	40.4	100.0
	Total	1000	100.0	100.0	

Appendix D

Demographic and education profile of survey respondents

	2007 survey	2003 survey	2001 survey	Census 2000
Sex				
Male	42%	41%	43%	48%
Female	58%	59%	57%	52%
Age				
18 to 24 years old	3%	7%	7%	13%
25 to 44 years old	26%	37%	38%	41%
45 to 64 years old	44%	38%	37%	29%
65 or older	26%	18%	18%	16%
Educational attainment				
Less than a high school diploma	2%	4%	6%	11%
High school graduate or GED	23%	25%	22%	31%
Some college	21%	16%	21%	23%
2-year degree (AA, AS, etc.)	13%	17%	14%	7%
College (4-year degree, BA, BS)	24%	26%	26%	19%
Graduate degree (MA, MS, MD, PhD, etc.)	17%	12%	10%	9%

Appendix E
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Note: Electronic media (websites, etc.) are listed throughout the document and in footnotes. Clicking on the link opens the relevant document.