

CONSERVATION BELIEFS AND ACTIONS IN THE SAND CREEK WATERSHED, MINNESOTA, U.S.A.



Center for Changing Landscapes

UNIVERSITY OF MINNESOTA

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CONSERVATION BELIEFS AND ACTIONS IN THE SAND CREEK WATERSHED, MINNESOTA, USA

A Final Technical Report
prepared for

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Executive Summary

This report describes the findings of a streamside landowner survey administered in the Sand Creek Watershed of Minnesota. The study was conducted by the Center for Changing Landscapes, University of Minnesota, in partnership with Scott Watershed Management Organization (WMO). The study was part of a larger Sand Creek Targeted Watershed Demonstration Program project funded by the Minnesota Board of Water and Soil Resources. The purpose of this study is to document and understand landowner values, attitudes, and behaviors associated with water resources and conservation practices. Study findings will assist water resource professionals in land use planning and in evaluating program outcomes.

Data were collected through a self-administered survey distributed to 1,000 streamside landowners in the Sand Creek watershed by U.S. Postal Service mail. Overall, 414 landowners completed and returned the survey for a final response rate of 42% (adjusted for 11 surveys returned undeliverable). The findings of this study are organized into six sub-sections – five sections responding to the unique research questions of the 2018 survey, and a final section comparing the findings to data from a similar 2011 landowner survey (Davenport & Pradhananga, 2012). Full datasets in tabular form are presented in Appendices A and B.

Key Findings

- Landowners surveyed place a high value on clean water, are concerned about water pollution and its varied impacts, and view themselves as stewards of the watershed. Most landowners reported feeling a sense of personal obligation to use conservation practices and do whatever they can to prevent water pollution.
- Landowners are influenced in their water-related decision making by multiple groups including family, neighbors, and the local Soil and Water Conservation District (SWCD).
- The biggest drivers of conservation practice adoption appear to be stewardship ethic, availability of financial incentives, and perceived benefits of conservation practices.
- Landowners believe in financial incentive-based programs to drive water resource protection but are unsure or opposed to government regulation and policy change as a driver of water protection.
- Only half of the landowners surveyed feel obligated to engage in civic actions (e.g., work with other community members to protect the environment or talk to others about conservation practices) or show interest in civic engagement activities and community action in water resource protection.
- When comparing 2011 and 2018 survey results, Scott County landowners' concern about the consequences of water pollution for their own lifestyles was higher. 2018 landowners also expressed less skepticism about anthropogenic climate change and its impacts than in 2011.
- Scott County landowners rated the water quality in their nearest stream/ditch as higher in 2018 than they did in 2011.
- Overall, Scott County landowners surveyed in 2018 place more responsibility on landowners, as well as local, state, and federal government to protect water quality than landowners in 2011.

- Scott County landowners' attitudes towards buffers have changed since 2011. Nearly three-quarters of landowners now feel a personal obligation to maintain a streamside buffer on their land, significantly higher levels than in 2011. In addition, Scott County landowners now feel a higher sense of personal obligation to use conservation practices in general than in 2011.
- In 2011 attending a community workshop was more of a motivator for buffer adoption than it is in 2018. Instead, 2018 landowners are more motivated by having physical help with planting and maintenance than landowners were in 2011.
- Scott County landowners surveyed in 2018 had less confidence than in 2011 that coordinating land use planning and engaging citizens in decision making across communities would protect water resources in Minnesota.

1. Background

This report describes a quantitative social science assessment of streamside landowner conservation behavior and water resource values in the Sand Creek Watershed of Minnesota. The study was conducted by the Center for Changing Landscapes, University of Minnesota (UMN), in collaboration with the Scott Watershed Management Organization (WMO). The study was part of a larger Sand Creek Targeted Watershed Demonstration Program project funded by the Minnesota Board of Water and Soil Resources.

The Sand Creek watershed extends into three Minnesota counties: Scott, Rice, and Le Sueur. Agriculture is a major land use in the 271-square-mile watershed. Major challenges for natural resource managers in the watershed include stream channel erosion, drained wetlands, loss of native vegetation, and high nutrient loads. In particular, the demonstration project focused on impacts to aquatic life from turbidity.

Resource managers and local decision makers are tasked with investing increasingly scarce resources to promote conservation practice adoption and community engagement around water resource protection. These efforts to promote adoption and increase engagement must be rooted in an understanding of the values and beliefs of local landowners in order to create effective and efficient behavior-changing programs.

The purpose of the study was to replicate a 2011 Sand Creek Watershed landowner survey (Davenport & Pradhananga, 2012). Four primary research questions drove the survey effort:

1. What are landowners' values, beliefs, and norms associated with water resources and water resource management?
2. What conservation behaviors do landowners currently engage in and what factors drive future conservation behavior?
3. What are landowners' perceptions of existing water resource programs?
4. How can policy-makers and resource managers best design and promote conservation programs that are ecologically and socially relevant?

This study provides resource professionals with an enhanced understanding of the drivers of, and constraints to, water resource protection among landowners. This study also tracks how landowner values, beliefs, and behaviors associated with water resources and conservation practices have changed over seven years, since the 2011 landowner survey that this study replicated. The 2018 survey was more extensive and included additional areas not surveyed in 2011 in the upper watershed.

2. Methods

This project used a quantitative approach to assess landowners' values, beliefs and norms. Data were collected through a self-administered mail survey distributed to a random sample of 1000 streamside landowners who own property within the Sand Creek Watershed. The Sand Creek Watershed contains portions of Scott, Rice, and Le Sueur counties.

A list of streamside property owners within the watershed and Scott, Rice and Le Sueur counties was generated by project partners at Scott Watershed Management Organization (WMO) from public property tax records. A total of 1000 questionnaires were distributed by U.S. Postal Service mail. The surveys were administered from February through April 2018.

Survey instruments were designed based on extensive literature review and feedback from project partners. The survey questionnaire included a variety of fixed-choice and scale questions. To compare 2018 survey findings to a previous 2011 survey conducted in the Sand Creek Watershed, many questions were kept verbatim. Questions also were adapted from previous Center for Changing Landscapes (CCL) survey instruments about attitudes, beliefs, and conservation behaviors (Davenport & Pradhananga, 2012; Davenport, Pradhananga, & Olson, 2014; Pradhananga, Perry, & Davenport, 2014; Pradhananga and Davenport, 2017). Each questionnaire was labeled with a unique identifying number to track responses and inform subsequent mailings.

In order to increase response rates, an adapted Dillman's (2014) Tailored Design Method was used. Three survey waves were administered: (1) the questionnaire (Appendix C) with a cover letter (Appendix D) and a self-addressed, business reply envelope; (2) a replacement questionnaire with a reminder letter (Appendix E) and envelope; and (3) a final replacement questionnaire with reminder letter and envelope. The University's Institutional Review Board reviewed the survey protocol for this project.

Returned questionnaires were logged into the respondent database. Microsoft Excel 2010 was used to track numerically coded response data. Statistical analyses were conducted using Statistical Package for Social Sciences (SPSS release 24). Basic descriptive statistics were conducted to determine variable frequency distributions. T-tests were conducted to assess relationships between variables and change in variables over time between the 2011 and 2018 surveys. Survey respondents in 2018 included landowners from Scott, Rice, and Le Sueur counties, while the survey in 2011 included landowners only from Scott County. To make accurate comparisons between 2011 and 2018 survey respondents, respondents to the 2018 survey from Rice and Le Sueur were removed from the 2018 dataset; then, the two datasets were combined. Subsequent statistical analysis compared 2011 and 2018 respondents using the pooled dataset of respondents from Scott County only.

Survey data and parcel data were also analyzed using ArcGIS Pro to create geospatially referenced data visualizations and findings. Inverse distance weighted interpolation (IDW) was used to best represent data while protecting survey respondent privacy. Individual survey responses and respondent locations were collected into and masked by a local value maintaining privacy and meeting IRB requirements for protecting human subject anonymity. Shaded polygons represent a calculated statistical average of response in a cluster of parcels; they do not reveal specific individual responses or parcels. Each graphic model (Appendix F) provides visual results of one dataset or survey question with consideration to the possible range of values.

3. Findings

Project findings are organized into two sections: 2018 survey findings and a comparison between select 2018 and 2011 survey findings.

3.1 2018 Survey Findings

Overall, 414 landowners completed and returned the survey for a response rate of 41.9% (adjusted for 11 surveys returned undeliverable). Complete statistics of all survey questions in aggregate are presented in tabular form in Appendix B.

3.1.1 Respondent and Community Profile

Who are respondents and what are their property ownership characteristics?

Respondents were asked a series of questions about their sociodemographic background, as well as questions about their property ownership. A majority of respondents (70%) were male. The respondents ranged in age from 25 to 96 with a median age of 61. The vast majority of respondents (95%) reported their race or ethnicity as White. One-third of respondents (34%) had attained at least a college bachelor’s degree. Forty-one percent reported an annual household income of \$100,000 or more (Appendix B, Table 8).

About half of respondents (48%) said their property was used for agricultural production, but only 10% of respondents reported that 50% or more of their income is dependent on agricultural production. A majority of respondents (72%) own and manage their own land and about the same proportion (75%) make their own management decisions. More than half (52%) of respondents report their property size is more than 20 acres (Appendix B, Table 9).

How do respondents view their community?

Survey respondents were asked what first comes to mind when they think of their community. Provided choices included nearest neighbors, city/township, county, and watershed. The majority of respondents defined their community as the city or township in which they live (81%) and their nearest neighbors (79%) (Appendix B, Table 10).

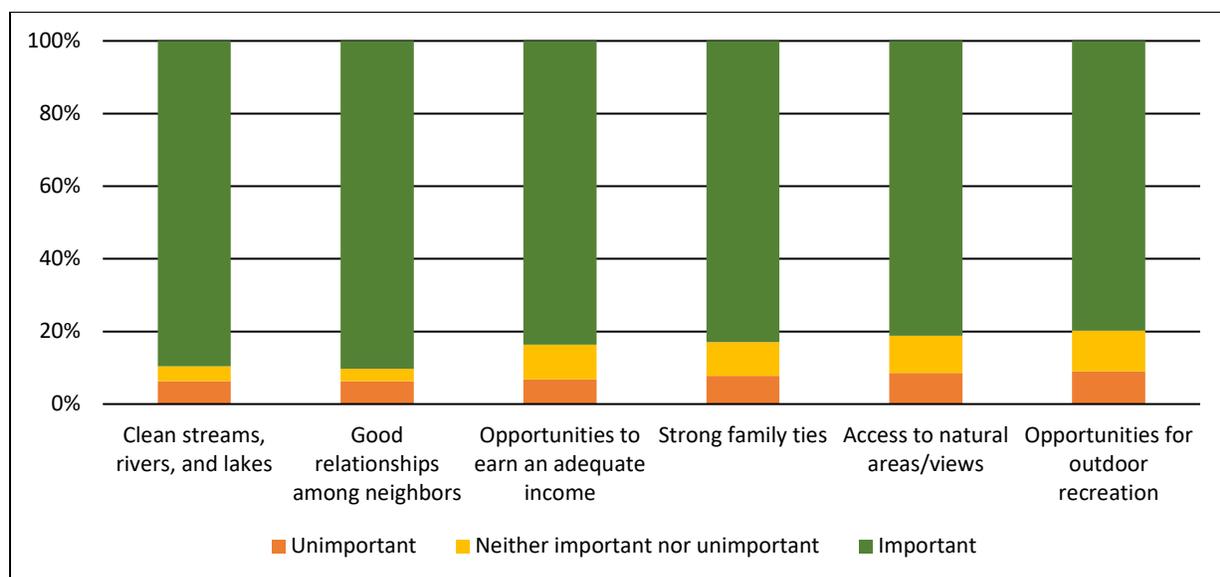


Figure 1. Respondents' ratings of community qualities (Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed)

When asked to rate the importance of several community qualities on a 5-point scale from very unimportant (-2) to very important (+2), the highest valued community amenities were clean streams, rivers, and lakes and good relationships among neighbors (both 90%) (Figure 1). A majority of respondents also rated opportunities to earn an adequate income (84%), strong family ties (83%), access to natural areas (81%), and opportunities for outdoor recreation (80%) as important qualities of a community (Appendix B, Table 11).

3.1.2 Perspectives on the Environment and Water Resources

What are respondents' beliefs about the environment?

Respondents were asked to rate a series of statements regarding their beliefs about the natural environment on a 5-point scale from strongly disagree (-2) to strongly agree (+2). A vast majority of respondents agreed that conservation practices protect aquatic life (87%) and contribute to the quality of life in their community (78%). Most respondents (73%) agreed that the balance of nature is delicate and easily upset. However over a quarter of respondents (28%) were unsure if water pollution poses serious threats to the quality of life in their own community (Appendix B, Table 12).

Respondents also viewed themselves as stewards of the watershed. Over three-quarters of respondents (78%) agreed with the statement “I think of myself as someone who is very concerned with environmental issues.” Nearly 60% agreed that engaging in water resource protection is an important part of who they are (Appendix B, Table 13).

Are respondents concerned about the consequences of water pollution?

Respondents were asked to indicate their level of concern related to the consequences of water pollution for different purposes or uses. Responses were on a 5-point scale from strongly disagree (-2) to strongly agree (+2).

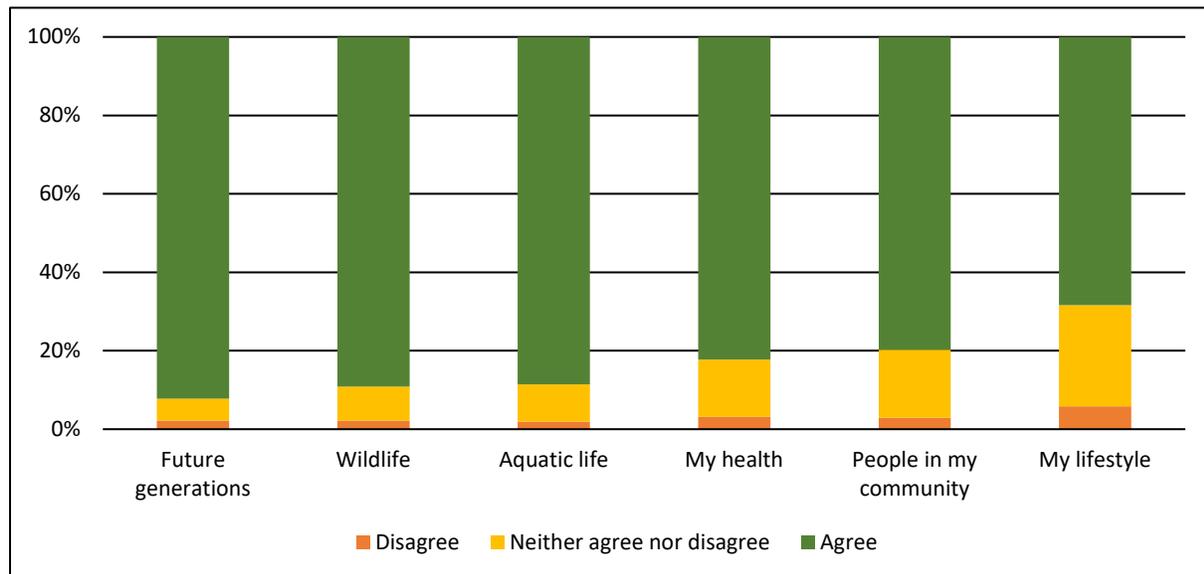


Figure 2. Respondents' concern about water pollution consequences (Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed)

A vast majority of respondents were concerned about the consequences of water pollution for future generations (92%), wildlife and aquatic health (89%), their own health (82%), and people in their community (80%) (Figure 2, Appendix B, Table 16).

3.1.3 Perspectives on Water Resource Protection

What are respondents' beliefs about water resource protection?

Respondents were asked to rate the extent to which they agree with a series of statements about water pollution and water resource protection on a 5-point scale from strongly disagree (-2) to strongly agree (+2). Overall, most respondents expressed beliefs that conservation practices are needed to protect the environment in general and water resources specifically. The vast majority of respondents (91%) agreed that it is their personal responsibility to ensure that their own land use does not contribute to water resource problems. Two-thirds of respondents agreed that water resources in Minnesota need better protection. Fewer than half of respondents (46%) believe that water resources in their community are adequately protected (Appendix B, Table 14).

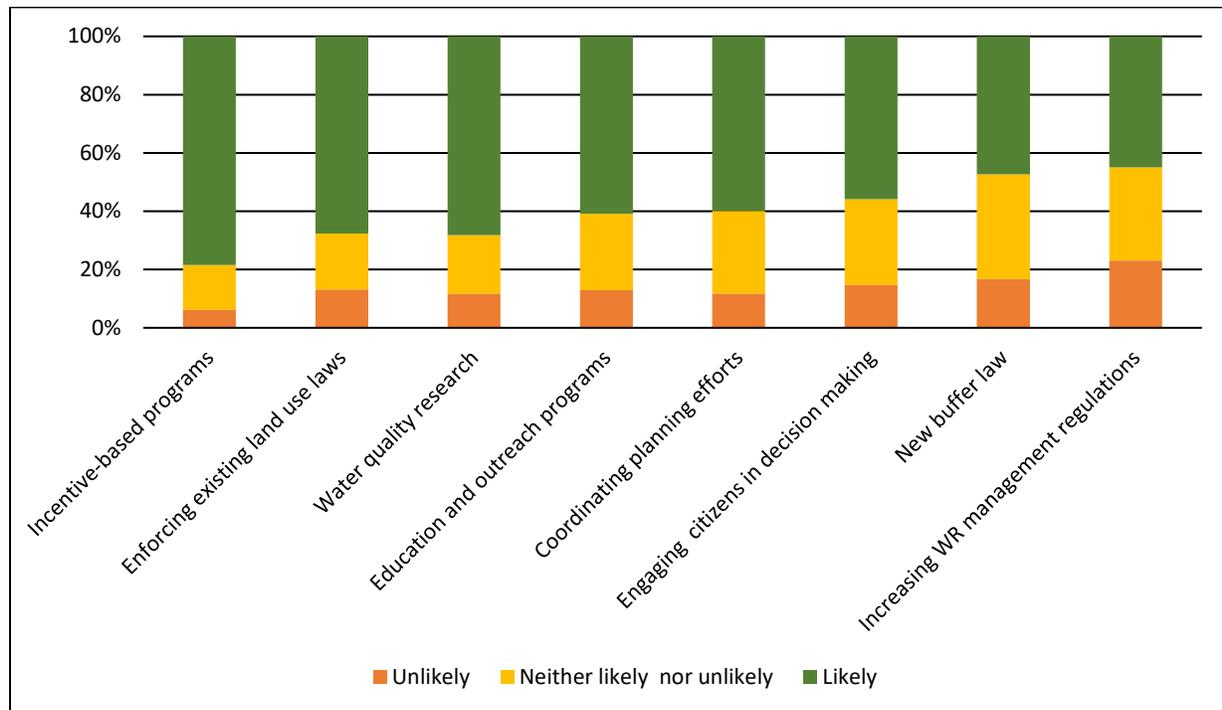


Figure 3. Respondents' perspectives on water resource protection actions (Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed)

Respondents were also asked about their views on actions to protect water resources. Statements were presented on a 5-point scale from very unlikely (-2) to very likely (+2). A majority of respondents (79%) agreed that expanding incentive-based programs that offer payments to landowners for conservation practices is likely to protect water resources (Figure 3). Two-thirds of respondents agreed that enforcing existing land use laws and regulations (68%) and conducting more water quality research and monitoring (68%) are likely to protect water resources. However, there were several actions that garnered uncertainty or skepticism from respondents. More than one-third of respondents were uncertain or doubtful that voluntary adoption education programs, coordinating efforts across communities, citizen engagement, Minnesota's new buffer law implementation, or increasing regulations would protect water resources. In fact, almost a quarter of respondents said increasing regulations that specifically address water resource management are *unlikely* to protect water resources (23%) (Appendix B, Table 25).

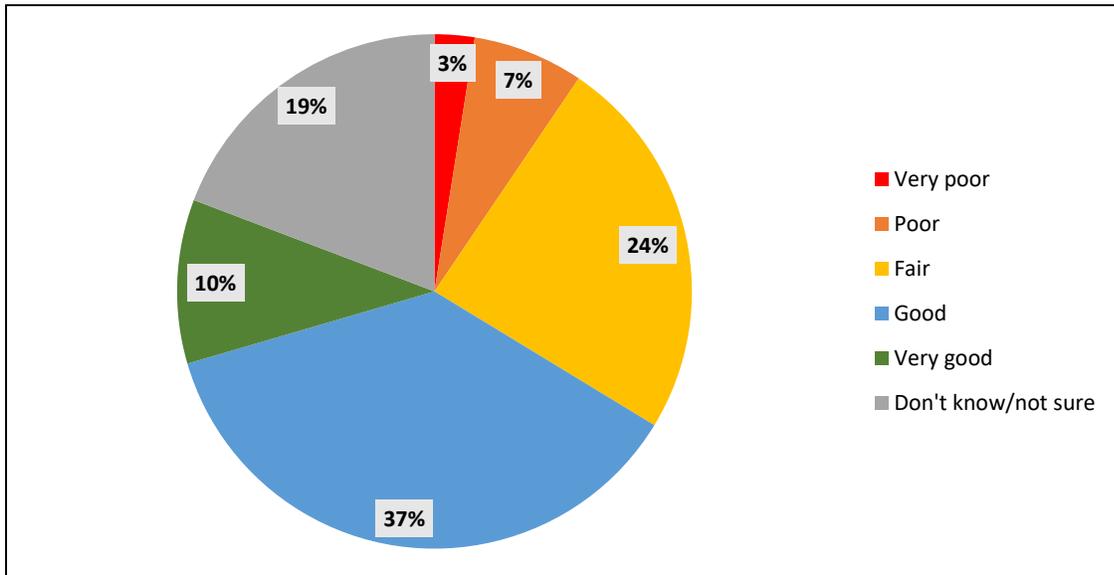


Figure 4. Respondents' ratings of local stream/ditch water quality (Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed)

Eighty-eight percent of respondents had land or property that borders a ditch, stream, lake, or river. Respondents were asked to rate the quality of the water in their stream/ditch on a 5-point scale from very poor (1) to very good (5). Roughly half of respondents reported their water quality was good to very good (47%), with fewer than 10% of respondents reporting their water quality was poor to very poor (Figure 4). About 20% of respondents were unsure about the quality of water in their local stream/ditch (19.2%) (Appendix B, Table 23).

Who do respondents believe is responsible for water resource protection?

Respondents were asked to rate the extent to which they agreed with a series of statements about responsibility for water resource protection on a 5-point scale from strongly disagree (-2) to strongly agree (+2). More than 90% of respondents agreed that it is their personal responsibility to make sure what they do on their land does not contribute to water resource problems (Appendix B, Table 14). Similarly, 89% of respondents agreed landowners/property owners in their community should be responsible for protecting water quality. Other entities that respondents agreed should be responsible for protecting water quality include local government (77%) and state government (73%), while only 60% of respondents believe the federal government should be responsible (Appendix B, Table 15).

Do respondents feel personally obligated to protect water resources?

Respondents were asked to rate the extent to which they felt a personal obligation to engage in various actions to protect water resources on a 5-point scale from strongly disagree (-2) to strongly agree (+2).

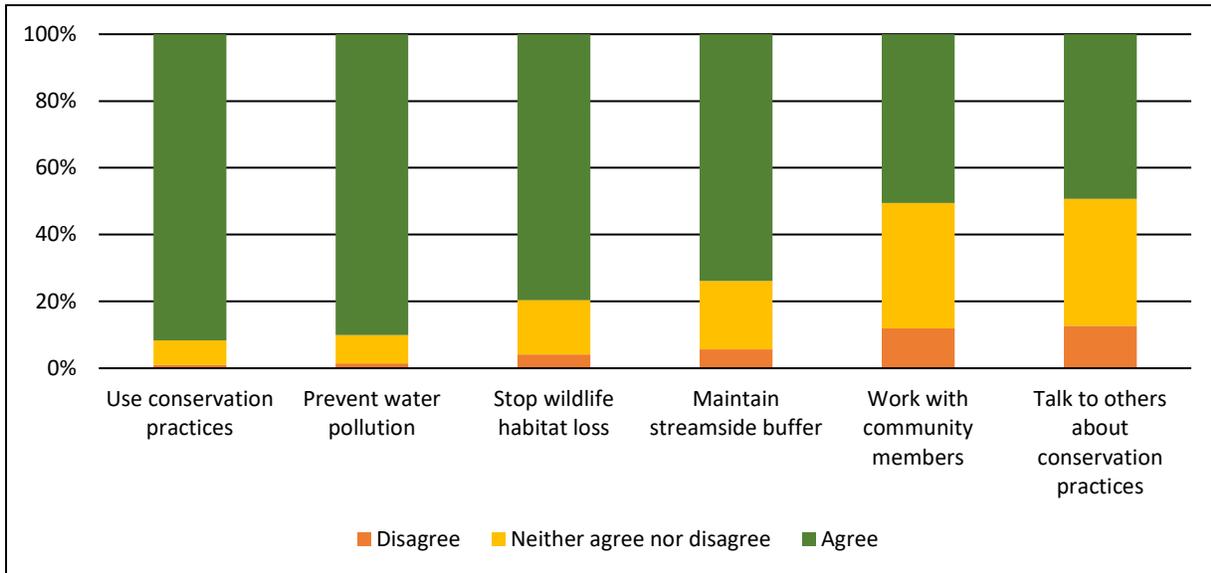


Figure 5. Respondents' feelings of personal obligation to protect water resources (Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed)

A vast majority of respondents reported feeling a personal obligation to use conservation practices on their land/property (92%), do whatever they can to prevent water pollution (90%), take actions to stop the loss of wildlife habitat (80%), and maintain a streamside buffer on their land/property (74%) (Figure 5). Half of respondents reported feeling a personal obligation to work with other community members to protect the environment (51%) or to talk to others about conservation practices (49%) (Appendix B, Table 18).

3.1.4 Conservation Practice Adoption

What conservation practices are respondents currently using and what practices are they likely to use in the future?

Respondents who reported using their land for agricultural production were asked to indicate to what extent they are using 10 different conservation practices on their properties on a 5-point scale from not at all (1) to in all possible locations (5).

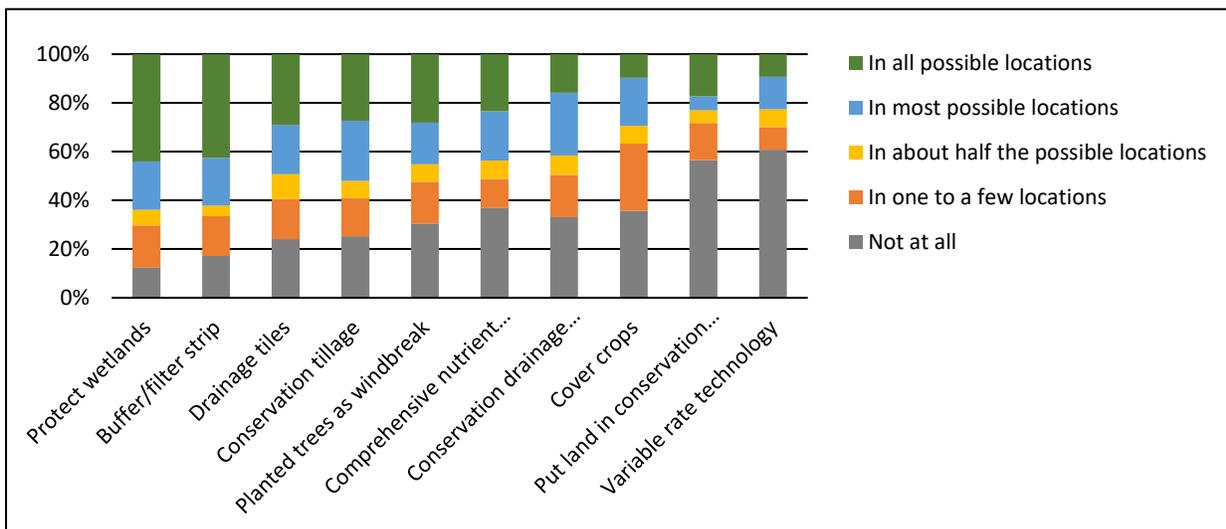


Figure 6. Respondents who do agricultural production current conservation practices (Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed)

The most frequently used practices (used in most or in all possible location) were protecting wetlands (64%), maintain buffer/filter strips along streams/ditches (62%), conservation tillage practices (52%) and drainage tiles (49%) (Figure 6). More than one-third of respondents reported never using conservation drainage management (33%), cover crops (36%), nor a comprehensive nutrient management plan (37%). More than half the respondents reported they do *not* have land in conservation cover (57%) or use variable rate technology (61%) (Appendix B, Table 21).

Respondents were asked to rate their intentions to adopt conservation practices in the next 12 months on a 5-point scale from most certainly not (-2) to most certainly will (+2). The majority of respondents were likely to protect wetlands on their land (76%). Many respondents were also likely to use drainage tiles on individual fields (61%). Nearly half of respondents (49%) reported they were *not* likely to have land in conservation cover (e.g. CRP, land retirement program) in the next 12 months. Fewer than one-third of respondents reported they would be likely to plant trees as a windbreak (32%) or use variable rate technology (28%) in the next 12 months (Appendix B, Table 22). Map 2 displays the geographic distribution of respondents' intentions to maintain a streamside buffer on their land/property (Appendix F, Map 2).

What would increase the likelihood that respondents would adopt or maintain conservation practices?

Respondents who reported their land bordered a stream/ditch or had a stream running through it were then asked to rate the extent to which they agreed with a series of statements about factors that would enhance their use of streamside buffers on a 5-point scale from strongly disagree (-2) to strongly agree (+2).

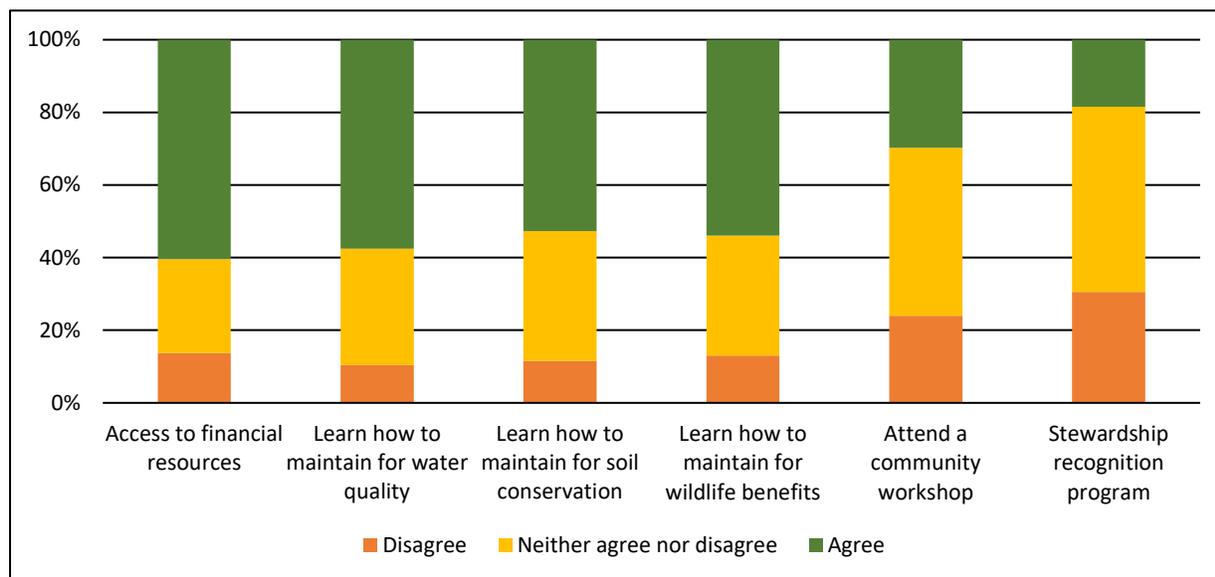


Figure 7. Respondents' perspectives on influences to adopt or maintain conservation practices (Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed)

Many respondents reported they would be more likely to maintain or continue to maintain their streamside buffer if they had access to financial resources to help plant and maintain it (61%) and could learn how to maintain their buffers for water quality purposes (58%) (Figure 7). Nearly half of respondents were *unsure* if a variety of factors would influence their likelihood to maintain a streamside buffer, including if their neighbors maintained buffers (47% unsure), if they were compensated for lost crop production due to the buffer (50% unsure), or if they were enrolled in a stewardship recognition program (51% unsure). Almost one-third of respondents reported “being enrolled in a registry program

that recognizes local conservation stewards” would *not* make them more likely to maintain a streamside buffer (Appendix B, Table 24).

3.1.5 Community Engagement and Action

How engaged are residents in their community?

Respondents were asked to indicate the extent to which they had engaged in six civic actions in the past 12 months on a 5-point scale from never (1) to weekly or more (5).

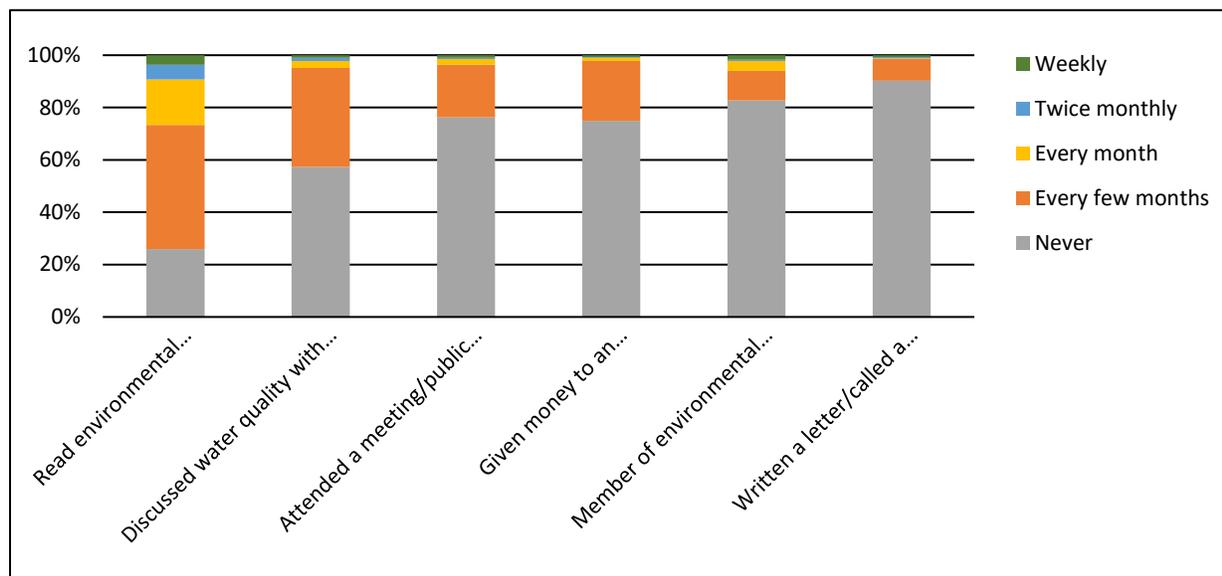


Figure 8. Respondents' current levels of civic engagement (Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed)

Reading any newsletters, magazines, or publications written by environmental groups was the most popular way respondents reported engaging in civic action (Figure 8). About half of respondents reported reading environmental texts every few months (47%) and another 27% reading every month or more frequently. More than forty percent of respondents reported discussing water quality issues with community members *at least* every few months (43%). The vast majority of respondents reported *never* engaging in most civic actions including “giving money to an environmental group” (74%), “attending a meeting, public hearing, or community discussion about an environmental issue” (76%), being a member of an environmental group (83%), and writing “a letter or calling a government official to support environmental protections” (90%) (Appendix B, Table 20).

How likely are respondents to be engaged in civic actions in the future?

Respondents were asked to indicate the extent to which they intend to engage in five civic actions in the next 12 months on a 5-point scale from most certainly not (-2) to most certainly will (+2).

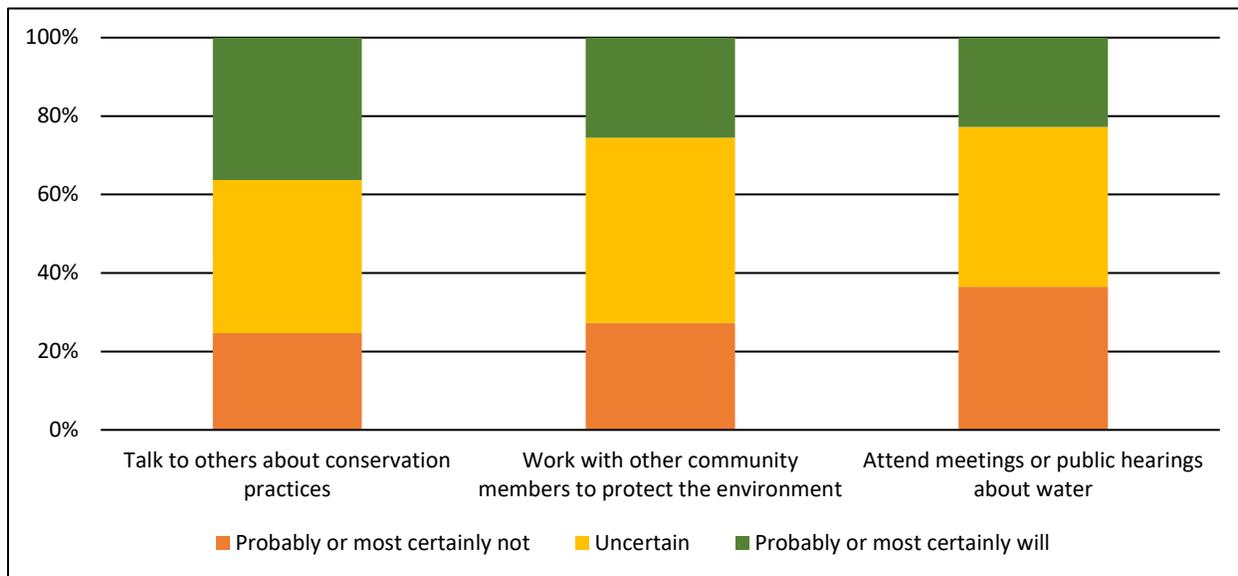


Figure 9. Respondents' future civic engagement intentions (Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed)

More than half of respondents reported they would likely take actions to protect water resources (54%) and take actions to stop the loss of wildlife habitat (56%) in the next 12 months (Figure 9). Fewer respondents reported they would be likely to talk to others about conservation practices (36%) or work with other community members to protect the environment (26%) in the next 12 months. Over a third of respondents reported they would *not* attend meetings or public hearings about water in the next 12 months (37%) (Appendix B, Table 19).

Who influences respondents' decisions about conservation?

Respondents were asked to rate the extent to which individuals or groups influence their decisions about conservation on a 5-point scale from very unlikely (-2) to very likely (+2). On average, the five individuals or groups with the biggest influence on respondents' conservation decision-making are family, their county's Soil and Water Conservation District (SWCD), neighbors, local Natural Resources Conservation Service (NRCS), and the Minnesota Department of Natural Resources (MNDNR), in that order. Over three-quarters of respondents reported "family" was somewhat or very likely to influence their conservation decision-making (77%). The county's Farm Bureau and property rights organizations were the least likely to have an influence on respondents' conservation decision-making (Appendix B, Table 17).

3.2 2011 and 2018 Survey Comparison

Statistical analyses were conducted to compare select survey respondents from the 2011 and 2018 survey on key variables including sociodemographic and property characteristics, beliefs about water quality, and norms and motivations for conservation action. While the 2018 survey included landowners from Scott, Rice, and Le Sueur counties, the survey in 2011 included landowners only from Scott County. To make accurate comparisons between 2011 and 2018 survey respondents, respondents from Rice and Le Sueur counties in the 2018 survey were removed from the 2018 dataset; then the two datasets were combined. Thus, all differences reported are between Scott County landowners only who responded to the 2011 and 2018 surveys.

Data analysis showed some statistically significant differences between 2011 and 2018 Scott County landowner respondents in their sociodemographic and property characteristics (Appendix A, Tables 2-6). 2018 respondents were older (61 vs. 56 median age) and a greater proportion of 2018 respondents (33%) were female than 2011 respondents (22%). A greater proportion of 2011 respondents (87%) than 2018 respondents (76%) reported that they make their own decisions on their land (Appendix A, Table 4). A greater proportion of 2018 respondents (92%) reported that their land borders a stream/ditch than 2011 respondents (76%) (Appendix A, Table 5).

There were significant statistical differences between 2011 and 2018 respondents in their beliefs about water quality and water resource protection. 2018 respondents rated the water quality in the stream/ditch that borders their property *higher* than 2011 respondents (3.54 vs 3.28 mean). More respondents in 2018 than in 2011 *disagreed* that claims that current levels of pollution are changing the earth's climate are exaggerated (-0.26 vs 0.12 mean). Respondents in 2018 agreed to a greater extent than 2011 respondents that landowners in their community should be responsible for protecting water quality (1.37 vs. 1.18 mean) (Appendix A, Table 6). Respondents in 2018 agreed to a greater extent than 2011 respondents that the federal (0.69 vs. 0.22 mean), state (0.97 vs. 0.58 mean), and local government (1.13 vs. 0.94 mean) should be responsible for protecting water quality (Appendix A, Table 6).

Some notable differences also were found between 2011 and 2018 respondents in their personal norms and motivations for conservation. Survey respondents in 2018 agreed to a greater extent than 2011 respondents that they feel a personal obligation to use conservation practices on their land/property (1.42 vs. 1.29 mean) and maintain a streamside buffer on their land/property (1.07 vs. 0.84 mean) (Appendix A, Table 7). Respondents in 2018 survey (Mean = 0.57) agreed to a greater extent than 2011 respondents (Mean = 0.35) that they would be more likely to maintain or continue to maintain streamside buffers on or adjacent to their property, if they had help with the physical labor of planting and maintaining streamside buffers (0.57 vs. 0.35 mean). Respondents in the 2018 survey agreed to a *lesser* extent than 2011 respondents that that they would be more likely to maintain or continue to maintain streamside buffers on or adjacent to their property if they could attend a community workshop or field day on streamside buffers (-0.01 vs. 0.18 mean) (Appendix A, Table 7). Respondents in 2018 were *less likely* than 2011 respondents to believe that coordinating land use and water planning efforts across communities (0.59 vs. 0.77 mean), and engaging more citizens in local land use and water resource decision making (0.51 vs. 0.76 mean) will protect the quality of water resources in Minnesota (Appendix A, Table 7).

4. Discussion and Recommendations

This study's aim was to provide a social science-based assessment of water resources beliefs and conservation behavior among streamside landowners in the Sand Creek Watershed, and to gauge if and how those attitudes have changed over time. Findings from this study will inform future community and water resource planning and management programs. The study also offers insight on trends over time in how landowners think and act in the watershed, when it comes to water resources. The following recommendations are based on a synthesis of 2018 survey findings, as well as an analysis of differences between 2018 and 2011 survey findings. This comparative analysis enables a pre- and post-assessment of five years of Sand Creek Watershed programming efforts from 2012-2017 and the effects on landowner beliefs. A caveat to the comparative analysis and any subsequent interpretations or conclusions is needed. Statistical differences between 2011 and 2018 survey respondents' beliefs and behaviors can be attributed to many factors beyond watershed programming including changes in the socio-political context, the economy, or landowner demographics. However, it is still useful to explore what the differences mean and how they may be correlated to programming and policies. Based on findings from the 2011 survey, watershed managers initiated new programs that acknowledge conservation success stories such as publications in county newsletters and local newspapers and held community-based conservation events (Appendix G). These findings and recommendations below offer some insight on the influence these programs have on landowners and how programs can continue to support conservation into the future.

Promote civic responsibility and action among community members for water protection.

Landowners surveyed in 2018 place more responsibility for water protection on local, state and federal government, as well as local landowners than landowners surveyed in 2011. Landowners in 2018 also have strong personal norms for taking water resource protection actions on their own land and adopting conservation practices that address water quality issues; these feelings of personal obligation appear to have grown since 2011. However, in both surveys landowners feel less obligated to engage in *civic* actions (e.g., working with other community members to protect the environment or talking to others about conservation practices) than engage in *individual* actions (e.g., maintain a streamside buffer). For example, the vast majority of landowners surveyed have never attended a public meeting or community discussion about an environmental issue. Similarly, most landowners have never discussed water quality issues with a fellow community member. Still, landowners strongly believe that having good relationships with neighbors is important – and many also stressed the importance of opportunities to be involved in community projects. The findings suggest that landowners feel obligated to adopt conservation practices and many of them do. Yet, they are less likely to talk to neighbors about these practices or share what they have learned at community meetings. This can be problematic because we know that relationships with neighbors are important and people believe they are influenced by their neighbors.

Past research suggests that personal and social norms of civic action are major drivers of community engagement in water resource protection (Davenport & Pradhananga, 2012; Pradhananga, Davenport & Perry, 2017). How can resource managers support personal and social norms? Through neighbor-to-neighbor dialogue. Supporting community conversations about water at all levels will be important. Continuing to share stories about successes and challenges in forums people use—newspapers, radio stations, community events. Leadership development can even be as simple as producing and sharing a pamphlet or video on *Five Simple Steps for Talking to your*

Neighbor/Landowner/Farmer about Conservation. Cultivating a more collectively shared sense of civic responsibility and willingness to talk about it will be important to advance engagement in water resource protection in the Sand Creek Watershed.

Maintain and develop incentive-based programs to promote conservation practice adoption.

Financial incentives appear to be a driver of conservation practice adoption; although, they are not the only driver. Learning about the benefits of streamside buffers for water quality, soil conservation, and wildlife habitat also are strong motivators. These findings and findings from similar studies suggest that financial incentives are effective at promoting adoption but learning about how and why conservation works (i.e., the multiple ecological and social benefits) promotes long-term commitment to and higher effort in conservation. As resource managers in the study area have observed, a combination of targeted information campaigns and education programs combined with short-term financial incentive opportunities works. Since 2011, hundreds of landowners have adopted new practices in the watershed (Pradhananga & Davenport, 2017). Moving forward, feedback on the outcomes of conservation practices, such as buffers, on water quality, soil conservation, wildlife habitat and community well-being is essential for long-term commitments to conservation. In addition, landowners surveyed in 2018 are more motivated by assistance with the physical labor of planting and maintaining buffers than those surveyed in 2011. This finding can be attributed to the new statewide buffer requirement which was signed into law in 2015 with a 2017 deadline for implementation. The law requires a buffer of perennial vegetation on public waterways and ditches.

Make local water monitoring and practice adoption data transparent, easily accessible, and timely.

Clean rivers, streams, and lakes are the most valued community characteristics among Sand Creek Watershed landowners. Moreover, landowners expressed concern about water pollution and its impacts to their community, to future generations, to wildlife, and to aquatic life. However, comparisons of 2018 and 2011 survey findings for Scott County landowners suggests that landowners today rate water quality in nearby streams as higher than they did seven years ago. At the same time, landowners today feel more personal obligation to use conservation practices and specifically, to adopt streamside buffers than in 2011. Perhaps today's landowner is better informed about local conservation efforts and successes in the watershed (e.g., delisting streams, conservation stewardship awards, etc.). Though some landowners today may not believe that civic engagement or recognition programs are likely to influence their own conservation practice adoption, hearing about successful programs may bolster beliefs about program efficacy. Feedback on water quality and social exchange around conservation practices has several important outcomes. Social feedback and exchange

- Generate socially comparative information about behavior and the effects of behavior on water;
- Raise awareness of social norms – community expectations for behavior;
- Build self-efficacy beliefs – competence, mastery; and
- Evoke feelings of pride, guilt, empathy, inspiration and when these feelings are internalized, can lead to purposeful and diligent action.

Knowing not only that conservation practices work, but also that landowners around the community use practices and believe practice adoption is important, creates a social norm and a sense of optimism for and pride in conservation action (Nelson, Davenport & Kuphal, 2017).

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Appendices

Appendix A. 2011 vs 2018 Inferential Statistics

Table 1. Number of respondents by survey year

Survey year	n	Percent
2011	432	62.9
2018	255	37.1
Total	687	100.0

Sources: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed; Your Perspectives on Local Water Resources: A survey of landowners in Sand Creek and Vermillion River Watersheds (2011)

2018 sample represents survey respondents only from Scott County

Table 2. Differences between 2011 and 2018 respondents in age

Survey year	n	Mean	SD	t ^a
2011	410	56.25	14.26	-4.046**
2018	245	60.90	14.24	

Sources: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed; Your Perspectives on Local Water Resources: A survey of landowners in Sand Creek and Vermillion River Watersheds (2011)

^aT-test statistic for testing differences in means.

**p < 0.001

SD = Standard deviation

Table 3. Difference between 2011 and 2018 respondents in their reported gender

Gender	Survey year ^a		χ^2
	2011	2018	
Male	77.9	67.4	8.910**
Female	22.1	32.6	

Sources: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed; Your Perspectives on Local Water Resources: A survey of landowners in Sand Creek and Vermillion River Watersheds (2011)

^aPercent

χ^2 Chi-square statistic for testing differences in proportions

**p < 0.001

Table 4. Difference between 2011 and 2018 respondents in the their property management decisions

Management decisions	Survey year ^a		χ^2
	2011	2018	
I make my own decisions	86.9	78.9	10.803**
I leave it up to my renter	4.5	10.9	
I work with my renter/landowner to make decisions	8.7	10.1	

Sources: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed; Your Perspectives on Local Water Resources: A survey of landowners in Sand Creek and Vermillion River Watersheds (2011)

^aPercent

χ^2 Chi-square statistic for testing differences in proportions;

**p ≤ 0.01

Table 5. Difference between 2011 and 2018 respondents about whether their land/property borders a stream/ditch

Land/property borders a stream/ditch or has streams/ditches running through it	Survey year ^a		χ^2
	2011	2018	
Yes	76.4	91.6	24.540**
No	23.6	8.4	

Sources: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed; Your Perspectives on Local Water Resources: A survey of landowners in Sand Creek and Vermillion River Watersheds (2011)

^aPercent

χ^2 Chi-square statistic for testing differences in proportions;

** $p \leq 0.01$

Table 6. Difference between 2011 and 2018 respondents in their beliefs about water quality and water resource protection, and concern about water pollution

Survey item	Survey year	n	Mean	SD	t^c
Rating of water quality in stream/ditch^a					
Rating of water quality in stream/ditch	2011	265	3.28	1.03	-2.780**
	2018	180	3.54	0.92	
Beliefs about water pollution^b					
Claims that current levels of pollution are changing the earth's climate are exaggerated	2011	408	0.12	1.48	3.278**
	2018	254	-0.26	1.37	
Concern (I am concerned about the consequences of water pollution for...)^b					
My lifestyle	2011	421	0.74	0.97	-2.715**
	2018	252	0.94	0.89	
Beliefs about water resource protection^b					
Landowners/property owners in my community should be responsible for protecting water quality	2011	420	1.18	0.87	-3.099**
	2018	254	1.37	0.66	
The federal government should be responsible for protecting water quality	2011	420	0.22	1.33	-4.587**
	2018	252	0.69	1.17	
The state government should be responsible for protecting water quality	2011	420	0.58	1.22	-4.302**
	2018	253	0.97	1.00	
Local government (i.e., county, city/township) should be responsible for protecting water quality	2011	420	0.94	0.99	-2.369*
	2018	253	1.13	0.94	

Sources: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed; Your Perspectives on Local Water Resources: A survey of landowners in Sand Creek and Vermillion River Watersheds (2011)

^aItem measured on a five-point scale from very poor (1) to very good (5)

^bItems measured on a five-point scale from strongly disagree (-2) to strongly agree (+2)

^cT-test statistic for testing differences in means.

* $p \leq 0.05$, ** $p \leq 0.01$

SD = Standard deviation

Table 7. Difference between 2011 and 2018 respondents in their personal norms, motivators of buffer adoption and beliefs about management actions to protect water resources

Survey item	Survey		Mean	SD	t ^c
	year	n			
Personal norms (I feel a personal obligation to...)^a					
Use conservation practices on my land/property	2011	417	1.29	0.75	-2.420*
	2018	254	1.42	0.62	
Maintain a streamside buffer on my land/property	2011	392	0.84	1.01	-2.903**
	2018	253	1.07	0.92	
Motivators of buffer adoption (I would be more likely to maintain or continue to maintain streamside buffers on or adjacent to my property if...)^a					
I had help with the physical labor of planting and maintaining streamside buffers	2011	319	0.35	1.10	-2.237*
	2018	223	0.57	1.14	
I could attend a community workshop or field day on streamside buffers	2011	313	0.18	1.13	2.002*
	2018	221	-0.01	0.99	
Beliefs about the likelihood that management actions will protect water resources in Minnesota^b					
Coordinating land use and water planning efforts across communities	2011	386	0.77	1.01	2.214*
	2018	248	0.59	0.96	
Engaging more citizens in local land use and water resource decision making	2011	384	0.76	1.00	3.062**
	2018	247	0.51	0.96	

Sources: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed; Your Perspectives on Local Water Resources: A survey of landowners in Sand Creek and Vermillion River Watersheds (2011)

^aItems measured on a five-point scale from strongly disagree (-2) to strongly agree (+2)

^bItem measured on a five-point scale from very unlikely (-2) to very likely (+2)

^cT-test statistic for testing differences in means.

* $p \leq 0.05$, ** $p \leq 0.01$

SD = Standard deviation

Appendix B. 2018 Survey Descriptive Statistics

Table 8. Respondents' sociodemographic characteristics

Socio-Demographic characteristics		N	Percent
Gender	Male	284	70.1
	Female	113	27.9
Hispanic, Latino, or Spanish origin	Yes	2	0.5
	No	398	99.5
Race*	White	392	94.7
	Black or African American	0	0
	American Indian or Alaska Native	3	0.7
	Asian Indian	0	0
	Native Hawaiian	0	0
	Pacific Islander	0	0
	Chinese	0	0
	Japanese	0	0
	Korean	0	0
	Vietnamese	0	0
	Fillipino	1	0.2
	Other Race (American, human, etc.)	13	3.1
Age	Median	61	-
	Minimum	25	-
	Maximum	96	-
Years lived in community	Median	40	-
	Minimum	0	-
	Maximum	90	-
Formal education	Did not finish high school	19	4.7
	Completed high school	94	23.3
	Some college but no degree	65	16.1
	Associate or vocational degree	88	21.8
	College bachelor's degree	79	19.6
	Some college graduate work	17	4.2
Completed graduate degree (MS or PhD)	42	10.4	
Household income	Under \$20,000	11	2.8
	\$20,000-\$49,999	54	14.0
	\$50,000-\$74,999	62	16.1
	\$75,000-\$99,999	36	9.3
	\$100,000-\$149,999	73	18.9
	\$150,000-\$199,999	35	9.1
	\$200,000-\$249,999	20	5.2
	\$250,000-\$299,999	7	1.8
	\$300,000 or more	24	6.2
Prefer to not respond	64	16.6	

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek
Watershed, Questions 19, 20, 21, 22, 23, 24, 25

*Respondents could give more than one response

N ≥ 386

Table 9. Respondents' property characteristics

Property Characteristics		N	Percent
Size of Property	No property (e.g. apartment, condo)	1	0.2
	Under 1 acre	22	5.4
	1-5 acres	61	15.0
	6-20 acres	111	27.3
	21-50 acres	58	14.3
	51-150 acres	80	19.7
	151 or more acres	73	18.0
Property used for agricultural production	Yes	190	48
	No	206	52
Percent income dependent on land/property	0%	207	51.9
	1-25%	119	29.8
	25-50%	31	7.8
	50% or more	42	10.5
Ownership arrangement	I own and manage my own land	286	72.6
	I rent my land <u>to</u> another party	108	27.4
	I rent my land <u>from</u> another party	0	0
Management decisions on land/property	I make my own decisions	305	75.5
	I leave it up to my renter	51	12.6
	I leave it up to the landowner/property owner	3	0.7
	I work together with renter/landowner to make decisions	45	11.1

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Questions 12, 26, 27, 28, 29

N ≥ 394

Table 10. Respondents' perception of their community

	N	Mean	SD^a	Strongly disagree^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
The city or township in which I live	408	1.16	1.04	4.2	4.2	10.0	34.3	47.3
My nearest neighbors	405	1.10	1.04	4.2	3.7	13.3	35.1	43.7
People who live within 1-3 miles from my home	405	1.00	1.07	4.7	5.2	13.3	39.0	37.8
The county in which I live	401	0.56	1.09	5.0	12.5	23.7	39.7	19.2
The watershed in which I live	401	0.34	1.14	8.0	12.2	35.7	26.4	17.7
The entire state of Minnesota	402	0.03	1.22	14.2	17.7	31.3	24.1	12.7
Other	47	0.60	0.88	0.0	4.3	53.2	21.3	21.3

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 1

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (2)

^aSD=Standard deviation

^b Percent

Table 11. Respondents' perceived importance of the qualities of a community

	N	Mean	SD ^a	Very unimportant ^b	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
Clean streams, rivers, and lakes	412	1.39	0.99	4.6	1.7	4.1	29.4	60.2
Good relationships among neighbors	412	1.38	0.97	4.4	1.9	3.4	31.8	58.5
Opportunities to earn an adequate income	409	1.32	1.03	3.9	2.9	9.5	24.9	58.7
Strong family ties	410	1.29	1.09	5.6	2.2	9.3	23.9	59.0
Access to natural areas/views	410	1.12	1.07	5.4	3.2	10.2	36.1	45.1
Opportunities for outdoor recreation	410	1.12	1.07	4.6	4.4	11.2	34.1	45.6
Opportunities to be involved in community projects	406	0.69	0.98	3.2	7.6	26.1	43.1	20.0
Opportunities to express my culture and traditions	408	0.35	1.04	5.9	11.8	37.5	31.6	13.2
Opportunities to serve in leadership roles	411	0.24	0.99	5.8	12.2	44.0	28.2	9.7

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 2

*Responses based on a 5-point scale from very unimportant (-2) to very important (2)

^aSD=Standard deviation

^b Percent

Table 12. Respondents' perspectives on the natural environment

	N	Mean	SD ^a	Strongly disagree ^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Conservation practices protect aquatic life.	411	1.30	0.84	1.5	2.2	9.2	39.2	47.9
Conservation practices contribute to quality of life in my community.	412	1.05	0.86	1.5	2.7	17.7	45.6	32.5
The balance of nature is delicate and easily upset.	412	0.93	1.04	2.2	10.0	14.8	38.3	34.7
The effects of water pollution on public health are worse than we realize.	410	0.67	1.14	5.1	10.7	24.1	32.0	28.0
Water pollution poses serious threats to the quality of life in my community.	411	0.54	1.15	5.8	12.2	28.0	29.9	24.1
Claims that current levels of pollution are changing the earth's climate are exaggerated.	411	-0.15	1.38	24.3	17.0	21.7	23.6	13.4
Laws to protect the environment limit my choices and personal freedom.	411	-0.38	1.31	27.7	21.4	19.0	24.8	7.1
Protecting the environment will threaten jobs for people like me.	407	-0.78	1.23	40.3	18.2	25.6	10.8	5.2

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 3

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (2)

^aSD=Standard deviation

^b Percent

Table 13. Respondents' perspectives on stewardship

	N	Mean	SD^a	Strongly disagree^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I think of myself as someone who is very concerned with environmental issues.	409	0.99	0.83	0.7	4.2	17.6	50.1	27.4
I think of myself as an environmental steward.	408	0.83	0.91	1.5	6.1	24.3	44.4	23.8
To engage in water resource protection is an important part of who I am.	409	0.63	0.97	2.4	8.8	30.8	39.1	18.8

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 4

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (2)

^aSD=Standard deviation

^b Percent

Table 14. Respondents' beliefs about on water pollution and water resource protection

	N	Mean	SD ^a	Strongly disagree ^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
It is my personal responsibility to make sure that what I do on my land does not contribute to water resource problems.	407	1.36	0.73	0.7	1.5	6.4	43.5	47.9
It is my personal responsibility to help protect water quality.	406	1.22	0.78	0.7	2.0	11.1	46.8	39.4
Someone who uses a conservation practice contributes to a clean environment.	409	1.15	0.78	0.5	2.7	13.2	48.4	35.2
My use of a conservation practice contributes to a clean environment.	406	1.14	0.72	0.5	1.0	14.0	53.0	31.5
Water resources in Minnesota need better protection.	408	0.78	0.88	1.0	6.4	26.5	45.6	20.6
People who are important to me expect me to take actions to protect water resources.	407	0.70	0.90	1.2	6.4	33.7	39.1	19.7
People who are important to me expect me to use conservation practices on my land.	406	0.70	0.88	1.2	6.2	31.8	42.6	18.2
Someone who <u>does not</u> use a conservation practice is responsible for the environmental consequences of that behavior.	409	0.64	1.07	3.7	12.0	23.7	38.1	22.5
Water resources in my community are adequately protected.	407	0.25	0.97	5.7	15.2	32.4	41.8	4.9
What I do on my land <u>doesn't</u> make much difference in overall water quality.	406	-0.90	1.02	32.0	40.1	16.3	9.4	2.2

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 5

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (2)

^aSD=Standard deviation

^b Percent

Table 15. Respondents' beliefs about responsibility for water resource protection

	N	Mean	SD ^a	Strongly disagree ^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Landowners/property owners in my community should be responsible for protecting water quality.	413	1.32	0.71	0.2	1.5	8.7	45.0	44.6
Streamside buffers help to improve water quality for people living downstream.	412	1.19	0.90	1.2	2.9	16.3	34.5	45.1
Local government (i.e. county, city/township) should be responsible for protecting water quality.	412	1.00	1.02	3.6	5.6	13.8	41.5	35.4
Streamside buffers should be protected because they provide habitat for wildlife.	411	0.98	1.05	3.4	4.6	21.7	31.1	39.2
The state government should be responsible for protecting water quality.	412	0.86	1.06	4.4	7.5	15.5	43.0	29.6
The federal government should be responsible for protecting water quality.	411	0.55	1.24	9.5	11.2	19.0	35.8	24.6
Streamside buffers reduce the value of land.	409	-0.44	1.15	22.7	24.0	34.7	12.2	6.4

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 6

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (2)

^aSD=Standard deviation

^b Percent

Table 16. Respondents' concern about the consequences of water pollution for the following:

	N	Mean	SD^a	Strongly disagree^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Future generations	411	1.46	0.74	1.0	1.2	5.6	34.8	57.4
Wildlife	413	1.38	0.77	0.7	1.5	8.7	37.3	51.8
Aquatic life	410	1.36	0.75	0.5	1.5	9.5	38.5	50.0
My health	411	1.20	0.85	1.2	1.9	14.6	39.9	42.3
People in my community	410	1.14	0.84	1.0	2.0	17.3	42.0	37.8
My lifestyle	411	0.91	0.93	1.7	4.1	25.8	38.2	30.2

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 7

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (2)

^a SD=Standard deviation

^b Percent

Table 17. Influences on respondents' conservation decisions

	N	Mean	SD^a	Very unlikely^b	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Very likely
My family	408	0.98	0.97	3.9	3.2	15.4	46.3	31.1
My county's Soil and Water Conservation District	409	0.84	0.87	1.7	6.1	18.6	53.5	20.0
My neighbors	408	0.70	0.95	3.7	7.1	21.1	51.7	16.4
My local Natural Resources Conservation Service	408	0.70	0.97	3.2	7.6	24.5	45.1	19.6
The MN Department of Natural Resources	406	0.67	1.08	6.4	7.6	19.0	46.8	20.2
My local Watershed Management Organization	407	0.64	0.98	3.4	8.4	26.5	44.0	17.7
People in my community	405	0.57	0.91	3.7	7.4	27.7	50.9	10.4
My local government	408	0.54	1.01	6.1	7.6	25.2	48.5	12.5
The MN Pollution Control Agency	408	0.49	1.16	8.8	9.3	24.8	38.0	19.1
Environmental organizations	406	0.36	1.17	10.8	9.4	27.3	37.9	14.5
Sportspersons clubs	410	0.35	1.03	7.6	10.5	30.5	42.7	8.8
A local Ag Cooperative Extension advisor	409	0.33	1.03	6.4	11.5	36.2	34.7	11.2
My county's Farm Bureau	409	0.13	1.02	8.1	14.4	41.3	28.9	7.3
Property rights organizations	408	0.00	1.06	12.0	13.7	41.7	27.0	5.6

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 8

*Responses based on a 5-point scale from very unlikely (-2) to very likely (2)

^aSD=Standard deviation

^b Percent

Table 18. Respondents' feelings of personal obligation

	N	Mean	SD^a	Strongly disagree^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Use conservation practices on my land/property.	411	1.40	0.68	0.2	0.7	7.3	42.3	49.4
Do whatever I can to prevent water pollution.	411	1.33	0.69	0	1.5	8.5	45.5	44.5
Take actions to stop the loss of wildlife habitat.	411	1.16	0.88	1.0	3.2	16.3	38.0	41.6
Maintain a streamside buffer on my land/property.	410	1.06	0.97	2.2	3.4	20.5	33.9	40.0
Work with other community members to protect the environment.	410	0.49	0.96	3.9	8.0	37.6	36.6	13.9
Talk to others about conservation practices.	410	0.47	1.01	5.1	7.6	38.0	33.7	15.6

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 9

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (2)

^aSD=Standard deviation

^b Percent

Table 19. Respondents' intentions to engage in civic actions in the next 12 months

	N	Mean	SD^a	Most certainly not^b	Probably not	Uncertain	Probably will	Most certainly will
Use conservation practices on my land/property.	411	1.12	0.869	1.0	3.4	16.3	41.1	38.2
Maintain a streamside buffer on my land/property.	409	0.90	1.056	1.7	8.8	24.4	27.9	37.2
Take actions to protect water resources.	411	0.59	0.992	1.9	11.2	33.1	33.8	20.0
Take actions to stop the loss of wildlife habitat.	411	0.58	1.024	3.2	10.9	30.2	36.0	19.7
Talk to others about conservation practices.	410	0.14	0.994	5.6	19.0	39.0	28.8	7.6
Work with other community members to protect the environment.	411	0.00	0.950	5.1	22.1	47.2	18.2	7.3
Attend meetings or public hearings about water.	408	-0.17	0.992	8.8	27.7	40.7	17.6	5.1

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 10

*Responses based on a 5-point scale from most certainly not (-2) to most certainly will (2)

^a SD=Standard deviation

^b Percent

Table 20. Respondents' engagement in civic actions in the past 12 months

	N	Mean	SD ^a	Never ^b	Every few months	Every month	Twice monthly	Weekly
Read any newsletters, magazines or other publications written by environmental groups	409	2.14	0.99	25.9	47.4	17.4	5.6	3.7
Discussed water quality issues with community members	408	1.51	0.70	57.4	37.7	2.7	1.2	1.0
Attended a meeting, public hearing or community discussion group about an environmental issue	409	1.30	0.63	76.3	20.0	2.2	0.5	1.0
Given money to an environmental group	407	1.29	0.58	74.9	22.9	1.2	0.2	0.7
Joined or been a member of any group whose main aim is to protect the environment	405	1.27	0.71	82.7	11.4	3.7	0.5	1.7
Written a letter or called a government official to support strong environmental protection	409	1.13	0.49	90.2	8.3	0.2	0.5	0.7

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 11

*Responses based on a 5-point scale from never (1) to weekly (5)

^a SD=Standard deviation

^b Percent

Table 21. Respondents' current conservation practice adoption on agricultural land

	N	Mean	SD ^a	Not at all ^b	In one to a few locations	In about half the possible locations	In most possible locations	In all possible locations
I protect wetlands on the land.	202	3.66	1.49	12.4	17.3	6.4	19.8	44.1
I maintain a buffer/filter strip along streams and ditches on individual fields.	209	3.54	1.57	17.2	16.3	4.3	19.6	42.6
I use drainage tiles on individual fields.	207	3.14	1.58	24.2	16.4	10.1	20.3	29.0
I use conservation tillage practices on individual fields (e.g., no till, minimum till).	198	3.13	1.58	25.3	15.7	7.1	24.7	27.3
I have planted trees as a windbreak.	210	2.95	1.64	30.5	17.1	7.1	17.1	28.1
I follow a comprehensive nutrient management plan on the farm.	197	2.81	1.65	37.1	11.7	7.6	20.3	23.4
I use conservation drainage management practices on individual fields.	202	2.74	1.53	33.2	17.3	7.9	25.7	15.8
I use cover crops on the land.	207	2.40	1.39	35.7	27.5	7.2	19.8	9.7
The farm has land in conservation cover (e.g., CRP, land retirement program).	209	2.12	1.55	56.5	15.3	5.3	5.7	17.2
I use variable rate technology.	194	2.01	1.44	60.8	9.3	7.2	13.4	9.3

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 13

*Responses based on a 5-point scale from not at all (1) to in all possible locations (5)

^aSD=Standard deviation

^b Percent

Table 22. Respondents' future conservation practice adoption intentions on agricultural land

	N	Mean	SD^a	Most certainly not^b	Probably not	Uncertain	Probably will	Most certainly will
Protect wetlands on the land.	203	1.06	1.17	6.4	4.4	13.3	28.1	47.8
Implement or maintain a buffer/filter strip along streams and ditches on individual fields.	202	0.94	1.29	6.9	10.4	12.9	21.3	48.5
Use conservation tillage practices on individual fields (e.g., no till, minimum till).	199	0.62	1.31	10.6	9.5	19.1	28.6	32.2
Use drainage tiles on individual fields.	201	0.58	1.49	16.9	9.0	12.4	22.9	38.8
Use conservation drainage management practices on individual fields.	200	0.30	1.31	13.5	13.5	23.5	28.5	21.0
Use cover crops on the land.	202	0.19	1.26	12.9	16.3	25.7	28.7	16.3
Implement or follow a comprehensive nutrient management plan on the farm.	201	0.13	1.31	15.4	14.4	30.3	20.9	18.9
Have land in conservation cover (e.g., CRP, land retirement program).	207	-0.14	1.61	30.0	19.3	12.6	10.6	27.5
Plant trees as a windbreak on the land.	203	-0.15	1.35	20.7	21.2	26.1	16.3	15.8
Use variable rate technology.	196	-0.20	1.28	21.4	17.3	33.7	15.3	12.2

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 14

*Responses based on a 5-point scale from most certainly not (-2) to most certainly will (2)

^aSD=Standard deviation

^b Percent

Table 23. Respondents' perspectives on local water quality

		N	Percent				
Land/property borders a ditch, stream, lake, or river	Yes	358	88				
	No	49	12				
		Very poor^a	Poor	Fair	Good	Very good	Don't know/ not sure
If yes, quality of water in the stream/ditch		2.5	7.0	24.2	36.8	10.3	19.2

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Questions 15, 16

*Responses based on a 5-point scale from very poor (1) to very good (5)

^aPercent

Table 24. Respondents' views about factors that would enhance their use of conservation practices

I would be <u>more</u> likely to maintain or continue to maintain streamside buffers on or adjacent to my property if...	N	Mean	SD^a	Strongly disagree^b	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I had access to financial resources to help me plant and maintain streamside buffers.	349	0.69	1.24	9.7	4.0	25.8	28.1	32.4
I could learn how to maintain streamside buffers for <u>water quality</u> .	346	0.61	1.02	5.2	5.2	32.1	38.4	19.1
I could learn how to maintain streamside buffers for <u>soil conservation</u> .	347	0.52	1.02	5.5	6.1	35.7	36.0	16.7
I could learn how to maintain streamside buffers for <u>wildlife benefits</u> .	345	0.50	1.05	7.0	6.1	33.0	38.3	15.7
I knew more about how to plant and maintain streamside buffers.	351	0.46	1.01	5.4	7.7	37.0	35.3	14.5
I had help with the physical labor of planting and maintaining streamside buffers.	348	0.46	1.16	8.3	8.6	33.6	27.9	21.6
I knew more about the benefits of streamside buffers.	352	0.38	0.98	6.0	6.3	43.2	32.7	11.9
My neighbors maintained streamside buffers.	350	0.28	1.04	8.9	5.4	46.6	27.4	11.7
I could learn how to maintain streamside buffers for <u>scenic quality</u> .	346	0.25	1.10	9.5	9.0	41.0	27.5	13.0
I were compensated for lost crop production because of streamside buffers.	346	0.24	1.18	11.3	6.4	49.7	12.1	20.5
I could attend a community workshop or field day on streamside buffers.	346	-0.01	1.01	11.6	12.4	46.2	25.4	4.3
I could be enrolled in a registry program that recognizes local conservation stewards.	347	-0.24	1.03	16.4	14.1	51.0	14.1	4.3

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 17

*Responses based on a 5-point scale from strongly disagree (-2) to strongly agree (2)

^aSD=Standard deviation

^b Percent

Table 25. Respondents' views about actions that will protect water resources

	N	Mean	SD^a	Very unlikely^b	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Very likely
Expanding incentive-based programs that offer payments to landowners for conservation practices.	404	1.07	0.96	3.0	3.2	15.3	40.6	37.9
Enforcing existing land use laws and regulations.	402	0.73	1.04	4.2	9.0	19.2	45.3	22.4
Conducting more water quality research and monitoring.	402	0.71	1.03	5.5	6.2	20.1	48.5	19.7
Promoting voluntary adoption of conservation practices through increased education and outreach programs.	401	0.60	0.99	4.0	9.0	26.2	44.6	16.2
Coordinating land use and water planning efforts across communities.	401	0.58	0.98	4.7	7.0	28.4	45.6	14.2
Engaging more citizens in local land use and water resource decision making.	401	0.48	1.02	5.7	9.0	29.4	43.1	12.7
Implementing the new buffer law.	399	0.38	1.14	9.5	7.3	35.8	30.1	17.3
Increasing regulations that specifically address water resource management.	398	0.28	1.14	8.8	14.3	31.9	30.4	14.6

Source: Your Perspectives on Local Water Resources: 2018 survey of landowners in Sand Creek Watershed, Question 18

*Responses based on a 5-point scale from very unlikely (-2) to very likely (2)

^aSD=Standard deviation

^b Percent

Your Perspectives on Local Water Resources

2018 survey of landowners in the Sand Creek Watershed



Thank you for taking the time to answer questions about your community and your watershed. The purpose of this survey is to understand the perspectives of landowners on their community and water resources. The findings from this study will be used to help resource managers and community leaders understand landowner perspectives on water resources and to facilitate communication and conservation programs.

Your opinions are very valuable to us. This survey is **voluntary and completely confidential.** Please answer the questions as completely as possible. It should take you about 20 minutes to complete the questionnaire. **Please complete the survey, fold it in thirds, and mail it back in the enclosed self-addressed stamped envelope.**

Please keep in mind the following definitions while you are completing this questionnaire.

A watershed is an area of land that drains water and suspended or dissolved materials to a common outlet at some point along a stream or river. The natural watershed drainage area can be altered by engineered drainage networks.

A streamside buffer is an area of land adjacent to streams or ditches that filters water, stabilizes the stream bank, and provides habitat for wildlife. To maintain or establish a streamside buffer, a landowner typically retains or plants native vegetation along a stream edge.

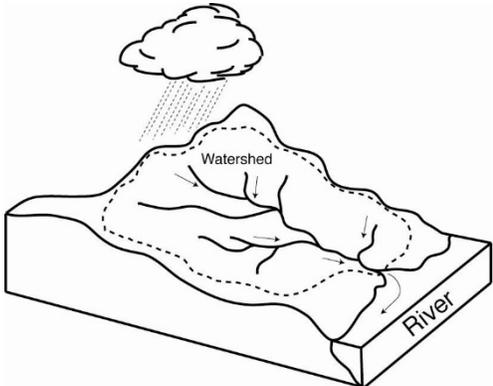


Diagram of the stream systems in a watershed

I. Your Community

First, we would like to know how you define and relate to your community.

1. To what extent do you agree or disagree with the following statements? (Check one box in each row)

When I think of my community, I think of...	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. My nearest neighbors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. People who live within 1-3 miles from my home.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. The city or township in which I live.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. The county in which I live.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. The watershed in which I live.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. The entire state of Minnesota.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Other (please specify): _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How important are the following qualities of a community to you? (Check one box in each row)

	Very unimportant	Somewhat unimportant	Neither important nor unimportant	Somewhat important	Very important
a. Strong family ties	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Good relationships among neighbors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Opportunities to be involved in community projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Opportunities to express my culture and traditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Clean streams, rivers, and lakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Access to natural areas/views	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Opportunities for outdoor recreation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Opportunities to earn an adequate income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Opportunities to serve in leadership roles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

II. The Environment

Next, we would like to know your thoughts on the natural environment.

3. To what extent do you agree or disagree with the following statements? (Check one box in each row)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. Protecting the environment will threaten jobs for people like me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Laws to protect the environment limit my choices and personal freedom.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. The effects of water pollution on public health are worse than we realize.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Water pollution poses serious threats to the quality of life in my community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. The balance of nature is delicate and easily upset.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Claims that current levels of pollution are changing the earth's climate are exaggerated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Conservation practices contribute to quality of life in my community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

h. Conservation practices protect aquatic life.	<input type="checkbox"/>				
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4. To what extent do you agree or disagree with the following statements? (Check one box in each row)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. I think of myself as someone who is very concerned with environmental issues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I think of myself as an environmental steward.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. To engage in water resource protection is an important part of who I am.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

III. Water Resources

In this section, we ask more specific questions related to your perspectives on water resources.

5. To what extent do you agree or disagree with the following statements? (Check one box in each row)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. Water resources in my community are adequately protected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Water resources in Minnesota need better protection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Someone who uses a conservation practice contributes to a clean environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Someone who <u>does not</u> use a conservation practice is responsible for the environmental consequences of that behavior.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. My use of a conservation practice contributes to a clean environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. People who are important to me expect me to use conservation practices on my land.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. What I do on my land <u>doesn't</u> make much difference in overall water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. It is my personal responsibility to help protect water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. It is my personal responsibility to make sure that what I do on my land does not contribute to water resource problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. People who are important to me expect me to take actions to protect water resources.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. To what extent do you agree or disagree with the following statements? (Check one box in each row)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. Landowners/property owners in my community should be responsible for protecting water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The federal government should be responsible for protecting water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. The state government should be responsible for protecting water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Local government (i.e. county, city/township) should be responsible for protecting water quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Streamside buffers help to improve water quality for people living downstream.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Streamside buffers reduce the value of land.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Streamside buffers should be protected because they provide habitat for wildlife.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. To what extent do you agree or disagree with the following statements? (Check one box in each row)

I am concerned about the consequences of water pollution for...	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. My health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Future generations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Wildlife	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. My lifestyle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Aquatic life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. People in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IV. Water and Civic Action

Now, we have a few questions about water protection and civic action.

8. How likely or unlikely is it that the following individuals or groups would influence your decisions about conservation practices on your land/property? *(Check one box in each row)*

	Very unlikely	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Very likely
a. My family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. My neighbors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. People in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. My local government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Environmental organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Sportspersons clubs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Property rights organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. My county's Soil and Water Conservation District	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. My county's Farm Bureau	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. My local Natural Resources Conservation Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. My local Watershed Management Organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. The MN Department of Natural Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. The MN Pollution Control Agency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. A local Ag Cooperative Extension advisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. To what extent do you agree or disagree with the following statements? *(Check one box in each row)*

I feel a personal obligation to...	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. Do whatever I can to prevent water pollution.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Take actions to stop the loss of wildlife habitat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Use conservation practices on my land/property.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Maintain a streamside buffer on my land/property.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Talk to others about conservation practices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Work with other community members to protect the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Please rate your intentions to engage in the following actions in the next year. (Check one box in each row)

In the <u>next 12 months</u> , I intend to...	Most certainly not	Probably not	Uncertain	Probably will	Most certainly will
a. Take actions to protect water resources.	<input type="checkbox"/>				
b. Take actions to stop the loss of wildlife habitat.	<input type="checkbox"/>				
c. Use conservation practices on my land/property.	<input type="checkbox"/>				
d. Maintain a streamside buffer on my land/property.	<input type="checkbox"/>				
e. Talk to others about conservation practices.	<input type="checkbox"/>				
f. Work with other community members to protect the environment.	<input type="checkbox"/>				
g. Attend meetings or public hearings about water.	<input type="checkbox"/>				

11. How often have you engaged in the following actions in the past year? (Check one box in each row)

In the <u>past 12 months</u> , how often have you ...	Never	Every few months	Every month	Twice monthly	Weekly
a. Discussed water quality issues with community members?	<input type="checkbox"/>				
b. Attended a meeting, public hearing or community discussion group about an environmental issue?	<input type="checkbox"/>				
c. Read any newsletters, magazines or other publications written by environmental groups?	<input type="checkbox"/>				
d. Given money to an environmental group?	<input type="checkbox"/>				
e. Written a letter or called a government official to support strong environmental protection?	<input type="checkbox"/>				
f. Joined or been a member of any group whose main aim is to protect the environment?	<input type="checkbox"/>				

The next questions ask about the land or property you own/rent.

12. Do you use your land/property for agricultural production? (Please check yes or no)

Yes

No (If no, please skip to Question 15)



13. Please identify the extent you are currently engaged in the following practices. (Check one box in each row)

	Not at all	In one to a few locations	In about half the possible locations	In most possible locations	In all possible locations
a. I use cover crops on the land.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I use variable rate technology.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I use conservation drainage management practices on individual fields.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I maintain a buffer/filter strip along streams and ditches on individual fields.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I use conservation tillage practices on individual fields (e.g., no till, minimum till).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. The farm has land in conservation cover (e.g., CRP, land retirement program).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. I use drainage tiles on individual fields.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. I protect wetlands on the land.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. I have planted trees as a windbreak.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. I follow a comprehensive nutrient management plan on the farm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Please rate your intentions to engage in the following actions in the next year. (Check one box in each row)

In the <u>next 12 months</u> , I intend to...	Most certainly not	Probably not	Uncertain	Probably will	Most certainly will
a. Use cover crops on the land.	<input type="checkbox"/>				
b. Use variable rate technology.	<input type="checkbox"/>				
c. Use conservation drainage management practices on individual fields.	<input type="checkbox"/>				
d. Implement or maintain a buffer/filter strip along streams and ditches on individual fields.	<input type="checkbox"/>				
e. Use conservation tillage practices on individual fields (e.g., no till, minimum till).	<input type="checkbox"/>				
f. Have land in conservation cover (e.g., CRP, land retirement program).	<input type="checkbox"/>				
g. Use drainage tiles on individual fields.	<input type="checkbox"/>				
h. Protect wetlands on the land.	<input type="checkbox"/>				
i. Plant trees as a windbreak on the land.	<input type="checkbox"/>				
j. Implement or follow a comprehensive nutrient management plan on the farm.	<input type="checkbox"/>				

15. Does the land/property you own or rent border a stream/ditch or have streams/ditches running through it? (Please check yes or no)

Yes No (If no, please skip to Question 18) 

16. How would you characterize the quality of water in the stream/ditch? (Please check one)

Very poor Poor Fair Good Very good
 Don't know/not sure

17. To what extent do you agree or disagree with the following statements? (Check one box in each row)

I would be <u>more</u> likely to maintain or continue to maintain streamside buffers on or adjacent to my property if...	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. I knew more about the benefits of streamside buffers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I knew more about how to plant and maintain streamside buffers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I had help with the physical labor of planting and maintaining streamside buffers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I had access to financial resources to help me plant and maintain streamside buffers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I were compensated for lost crop production because of streamside buffers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. I could attend a community workshop or field day on streamside buffers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. I could be enrolled in a registry program that recognizes local conservation stewards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. My neighbors maintained streamside buffers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. I could learn how to maintain streamside buffers for <u>wildlife benefits</u> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. I could learn how to maintain streamside buffers for <u>scenic quality</u> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. I could learn how to maintain streamside buffers for <u>soil conservation</u> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. I could learn how to maintain streamside buffers for <u>water quality</u> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. In your opinion, how likely is it that the following management actions will protect the quality of water resources in Minnesota? (Check one box in each row)

	Very unlikely	Somewhat unlikely	Neither likely nor unlikely	Somewhat likely	Very likely
a. Conducting more water quality research and monitoring.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Enforcing existing land use laws and regulations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Increasing regulations that specifically address water resource management.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Expanding incentive-based programs that offer payments to landowners for conservation practices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Promoting voluntary adoption of conservation practices through increased education and outreach programs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Coordinating land use and water planning efforts across communities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Engaging more citizens in local land use and water resource decision making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Implementing the new buffer law.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

V. Information about You

Finally, we want to know a little bit about you in order to better understand who responded to this survey. Remember, your responses to all of the survey questions are confidential and will only be used in aggregate.

19. Approximately how many years have you lived in your community? _____

20. In what year were you born? _____

21. Are you... Male Female Prefer not to respond

22. What is the highest level of formal education you have completed? (Please check one)

- Did not finish high school College bachelor's degree
 High school diploma/GED Some college graduate work
 Some college but no degree Completed graduate degree (Master's or Ph.D.)
 Associate degree or vocational degree

23. Are you of Hispanic, Latino or Spanish Origin? (Please check yes or no)

- Yes No

24. How would you describe your race? (Please check all that apply)

- White Native Hawaiian Korean
 Black or African American Pacific Islander Vietnamese
 American Indian or Alaska Native Chinese Filipino
 Asian Indian Japanese Other Race (Please specify)_____

25. Which of the following best describes your total household income from all sources in 2017 before taxes? (Please check one)

- | | | |
|--|--|--|
| <input type="checkbox"/> Under \$20,000 | <input type="checkbox"/> \$75,000-\$99,999 | <input type="checkbox"/> \$200,000-\$249,999 |
| <input type="checkbox"/> \$20,000-\$49,999 | <input type="checkbox"/> \$100,000-\$149,999 | <input type="checkbox"/> \$250,000-\$299,999 |
| <input type="checkbox"/> \$50,000-\$74,999 | <input type="checkbox"/> \$150,000-\$199,999 | <input type="checkbox"/> \$300,000 or more |
| <input type="checkbox"/> Prefer not to respond | | |

26. Which of the following best describes the size of your current land/property? (Please check one)

- | | |
|---|--|
| <input type="checkbox"/> No property (e.g., apartment, condo) | <input type="checkbox"/> 21-50 acres |
| <input type="checkbox"/> Under 1 acre | <input type="checkbox"/> 51-150 acres |
| <input type="checkbox"/> 1-5 acres | <input type="checkbox"/> 151 acres or more |
| <input type="checkbox"/> 6-20 acres | |

27. What percent of your income is dependent on your land/property? (Please check one)

- 0%
- 1-25%
- 25-50%
- More than 50%

28. Which of the following best describes the ownership arrangement of your land/property? (Please check one)

- I own and manage my own land/property
- I rent my land/property to another party
- I rent my land/property from another party
- Other (please specify): _____

29. Who makes the management decisions on your property? (Please check one)

- I make my own decisions
- I leave it up to my renter
- I leave it up to the landowner/property owner
- I work together with renter/landowner to make decisions

30. Do you have any other comments about your community, conservation practices, or water resource management?

Thank you for your help!

**Please complete the survey, fold it in thirds, and
mail it back in the enclosed self-addressed stamped envelope.**

If you have questions about the survey or the project, please contact Dr. Mae Davenport, Department of Forest Resources, 115 Green Hall, 1530 Cleveland Avenue N., St. Paul, MN 55108. Phone: (612) 624-2721 or Amit Pradhananga by email at prad0047@umn.edu.

Image Credits: Cover Photo: J. Rockney (formerly of Scott SWCD), Watershed diagram: E. Seekamp

Appendix D. Survey Cover Letter

[Date]

[Full Address]

Information Sheet

Dear [First name Last name],

I am writing to ask for your help in a study about your community and its water resources. The study is being conducted by Mae Davenport, Department of Forest Resources, University of Minnesota and is being funded by the Scott County Water Management Organization. I am contacting you because you are a landowner or property owner in the Sand Creek watershed and we believe you have an important perspective to share on the future of your community and its water resources. The purpose of this survey is to learn more about how local landowners or property owners like you perceive and interact with their community, their environment, and specifically their water resources. The findings from this study will be used to help resource managers and community leaders better understand landowners' views and to facilitate communication and outreach programs in the future, as well as evaluate the impacts of current outreach programs. Your input will inform water and land management decisions in the Sand Creek watershed. We are only contacting a random sample of landowners in this area, so it is important that we hear from you!

This survey is voluntary and completely confidential. The risks of participating in this study are minimal. There are no direct benefits to you for participating in this study. You are free to withdraw at any time. Completion of this survey indicates your voluntary consent to participate. Your decision to participate will not affect your current or future relationship with the University of Minnesota. The ID # on the front page of your survey is used to help us track mailings and will ensure that your name is never affiliated with your responses. Please answer the questions as completely as possible. It should take you only about 20 minutes to complete the questionnaire. Once you have **completed the questionnaire, fold it in thirds and mail it back in the enclosed self-addressed, postage-paid envelope.**

We would be happy to answer any questions or listen to any comments you may have about this study. Please feel free to contact me by phone at 612-624-2721, or by email at mdaven@umn.edu. If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Fairview Research Helpline at telephone number 612-672-7692 or toll free at 866-508-6961. You may also contact this office in writing or in person at University of Minnesota Medical Center, Fairview Riverside Campus, 2200 Riverside Avenue, Minneapolis, MN 55454.

I hope you enjoy completing the questionnaire and I look forward to receiving your response.
Sincerely,



Mae Davenport
Professor

Appendix E. Survey Reminder Letter

[Date]

[Full Address]

Dear [First name Last name],

A few weeks ago I sent you a questionnaire that asked about your perspectives on your community and its water resources. According to our records, I have not yet received your response.

I am writing again because of the importance your participation has in the success of this study. Your opinions will inform management decisions in your community related to water resources and will guide outreach and education programs. The responses we have already received from other landowners in your watershed show a range of beliefs about water resources and support for watershed management initiatives. We want to ensure that your opinions are represented too! We are only contacting a sample of landowners in your area, so it is important that we hear from you.

The purpose of this survey is to learn more about how local landowners perceive and interact with their community, their environment, and specifically their water resources. The study is being conducted by the Department of Forest Resources, University of Minnesota and is being funded by the Scott County Water Management Organization.

This survey is voluntary and completely confidential. The ID # on the front page of your survey is used to help us track mailings and will ensure that your name is never affiliated with your responses. Please answer the questions as completely as possible. It should take you only about 20 minutes to complete the questionnaire. Once you have **completed the questionnaire, fold it in thirds and mail it back in the enclosed self-addressed postage-paid envelope.**

We would be happy to answer any questions or listen to any comments you may have about this study. Please feel free to contact me by phone at 612-624-2721, or by email at mdaven@umn.edu.

I hope you enjoy completing the questionnaire and look forward to receiving your response.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Mae Davenport', with a stylized flourish at the end.

Mae Davenport
Professor

Appendix F. Spatial Analysis Maps

Map 1. Respondents perspectives on local water resource protection

Water resources in my community are adequately protected

Landowner Survey in Sand Creek Watershed, Minnesota, USA 2018

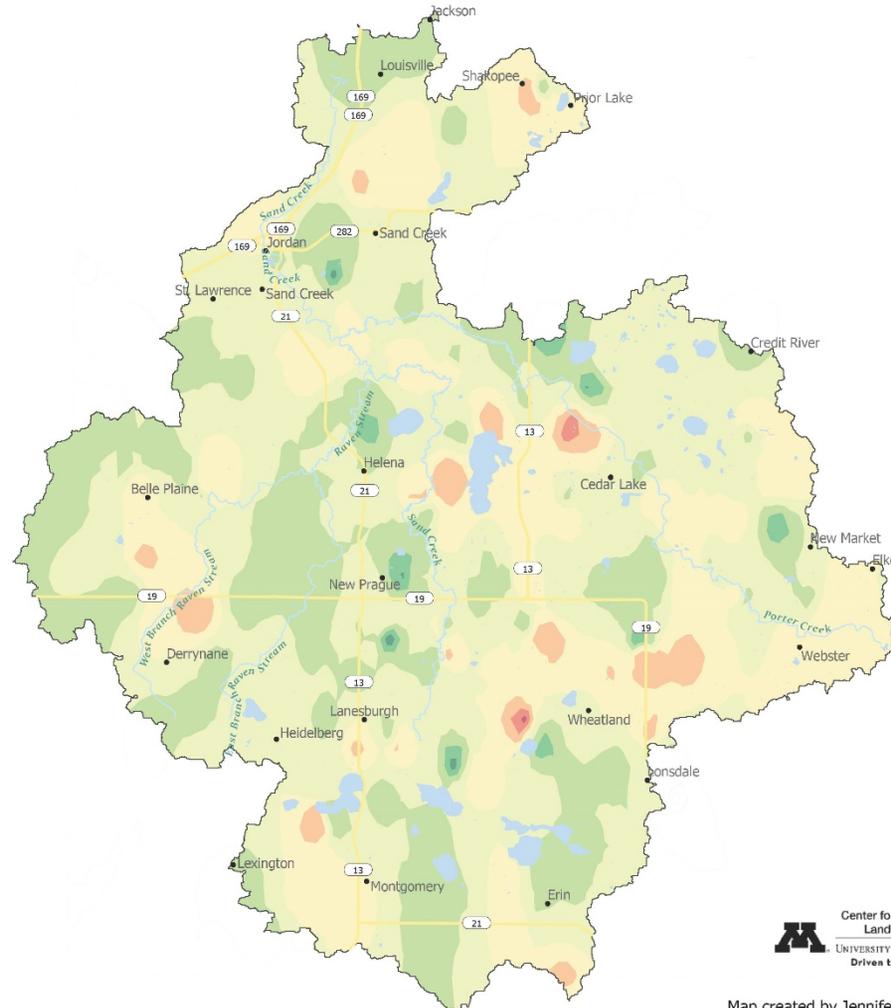
n = 398

- Cities and Townships
- Major streams
- Major roads
- Lakes
- Sand Creek Watershed

Level of agreement:

- Strongly disagree
- Neither agree nor disagree or no data
- Strongly agree

Social data was geospatially analyzed using the weighted distance interpolation method to protect individual respondent identities and privacy. Thus, shaded polygons represent a calculated statistical average of responses in a cluster of parcels and not individual responses or parcels.



Map created by Jennifer Moeller

Source: Survey Question #5a, Your Perspectives on Local Water Resources

Map 2. Respondents intentions to maintain a streamside buffer

Intentions to Maintain a Streamside Buffer on my land/property

Landowner Survey in Sand Creek Watershed, Minnesota, USA 2018

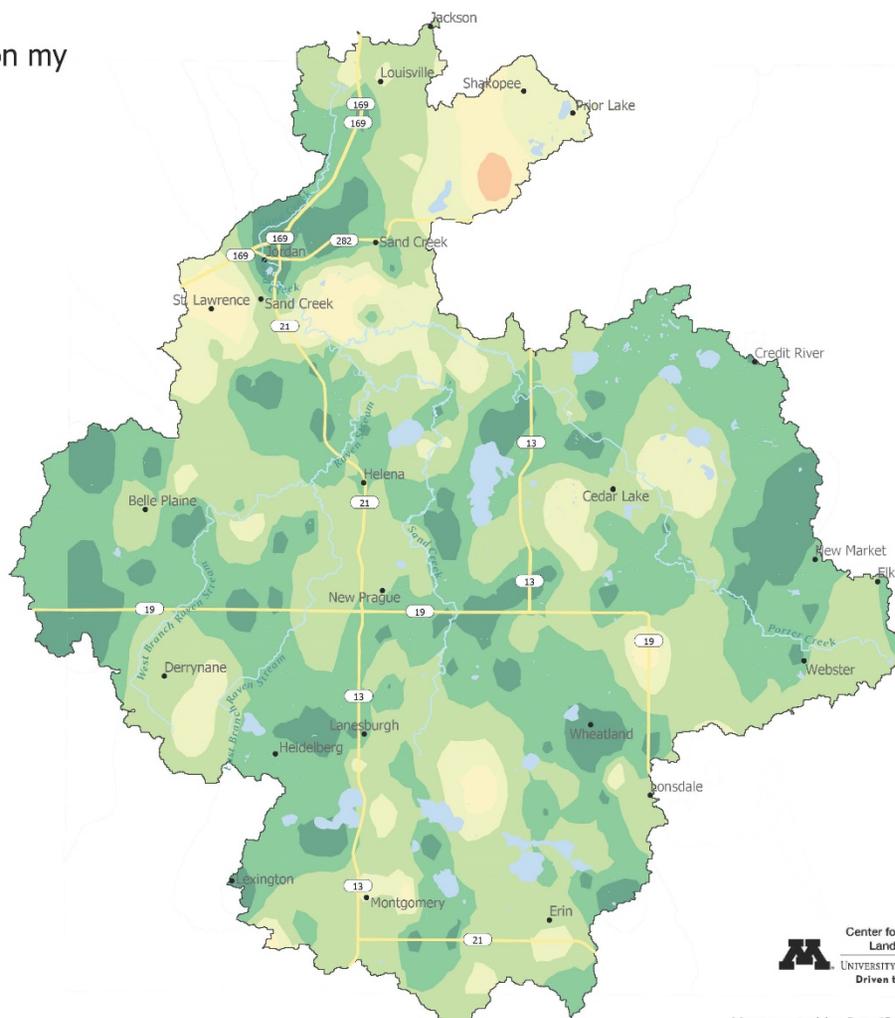
n = 398

- Cities and Townships
- Major streams
- Major roads
- Lakes
- Sand Creek Watershed

Level of intention to use a streamside buffer in the future:

- Most certainly not
- Uncertain or no data
- Most certainly will

Social data was geospatially analyzed using the weighted distance interpolation method to protect individual respondent identities and privacy. Thus, shaded polygons represent a calculated statistical average of responses in a cluster of parcels and not individual responses or parcels.



Map created by Jennifer Moeller
Source: Survey Question #10c, Your Perspectives on Local Water Resources

Map 3. Respondents ratings on important aspects of a community: good relationships among neighbors

The Importance of Good Relationships among Neighbors

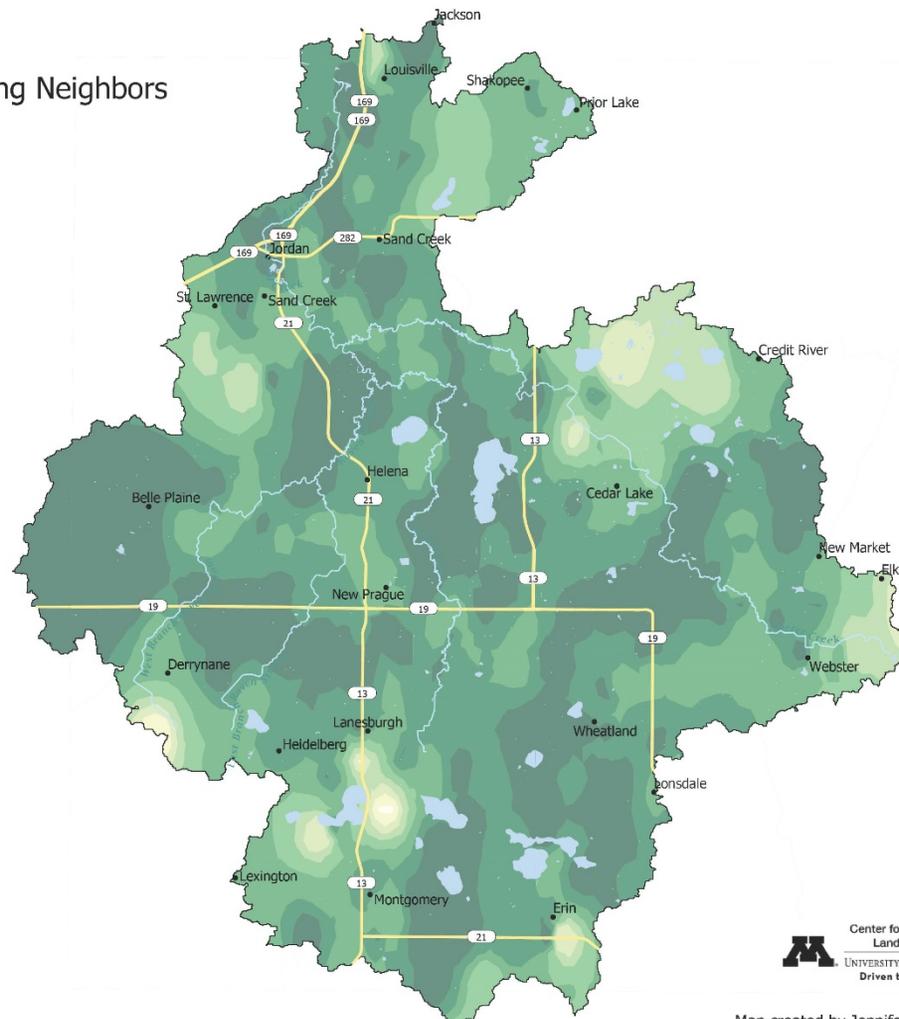
Landowner Survey in Sand Creek Watershed, Minnesota, USA 2018

n = 398

- Cities and Townships
- Major streams
- Major roads
- Lakes
- Sand Creek Watershed

- Level of importance:
- Very unimportant
 - Neither important nor unimportant or no data
 - Very important

Social data was geospatially analyzed using the weighted distance interpolation method to protect individual respondent identities and privacy. Thus, shaded polygons represent a calculated statistical average of responses in a cluster of parcels and not individual responses or parcels.



Map created by Jennifer Moeller

Source: Survey Question #2b, Your Perspectives on Local Water Resources

Map 4. Respondents rating on important aspects of a community: opportunities to be involved in community projects

The Importance of Opportunities to be Involved in Community Projects

Landowner Survey in Sand Creek Watershed, Minnesota, USA 2018

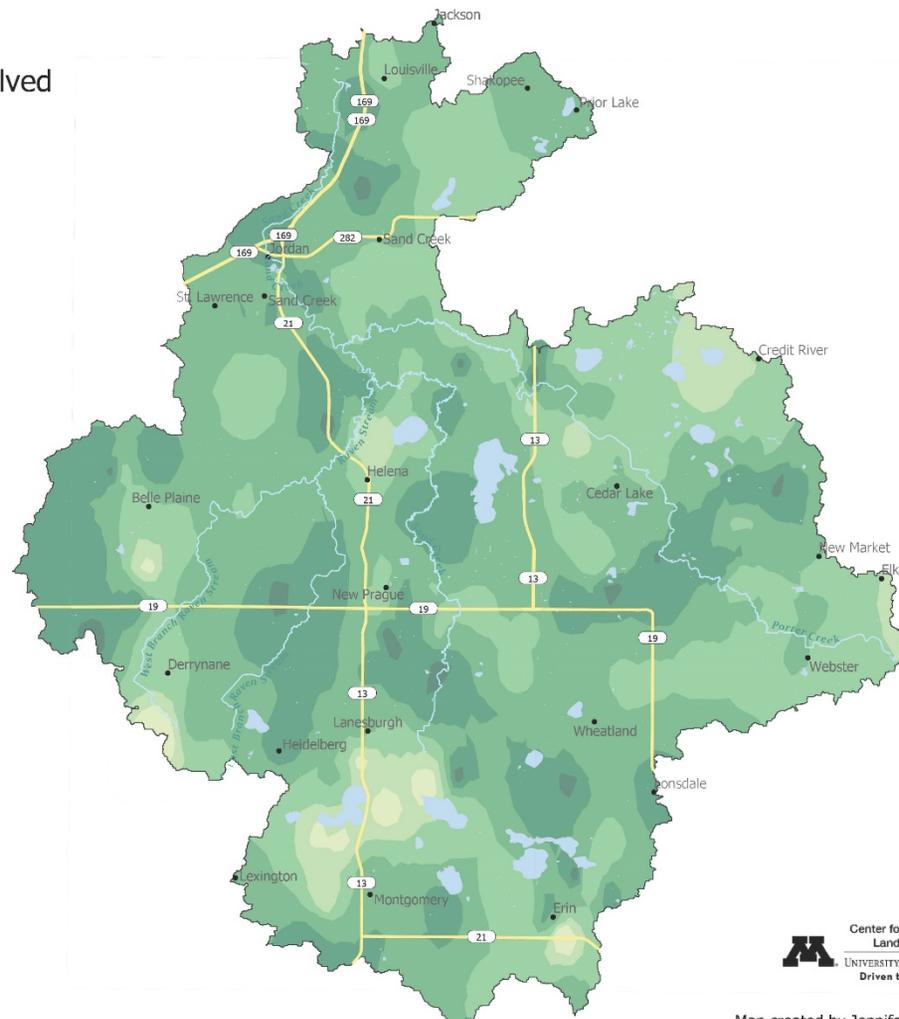
n = 398

- Cities and Townships
- Major streams
- Major roads
- Lakes
- Sand Creek Watershed

Level of importance:

- Very unimportant
- Neither important nor unimportant or no data
- Very important

Social data was geospatially analyzed using the weighted distance interpolation method to protect individual respondent identities and privacy. Thus, shaded polygons represent a calculated statistical average of responses in a cluster of parcels and not individual responses or parcels.



Map created by Jennifer Moeller
Source: Survey Question #2c, Your Perspectives on Local Water Resources

Map 5. Respondents rating on important aspects of a community: clean streams, lakes, and rivers

The Importance of Clean Streams, Lakes & Rivers

Landowner Survey in Sand Creek Watershed, Minnesota, USA 2018

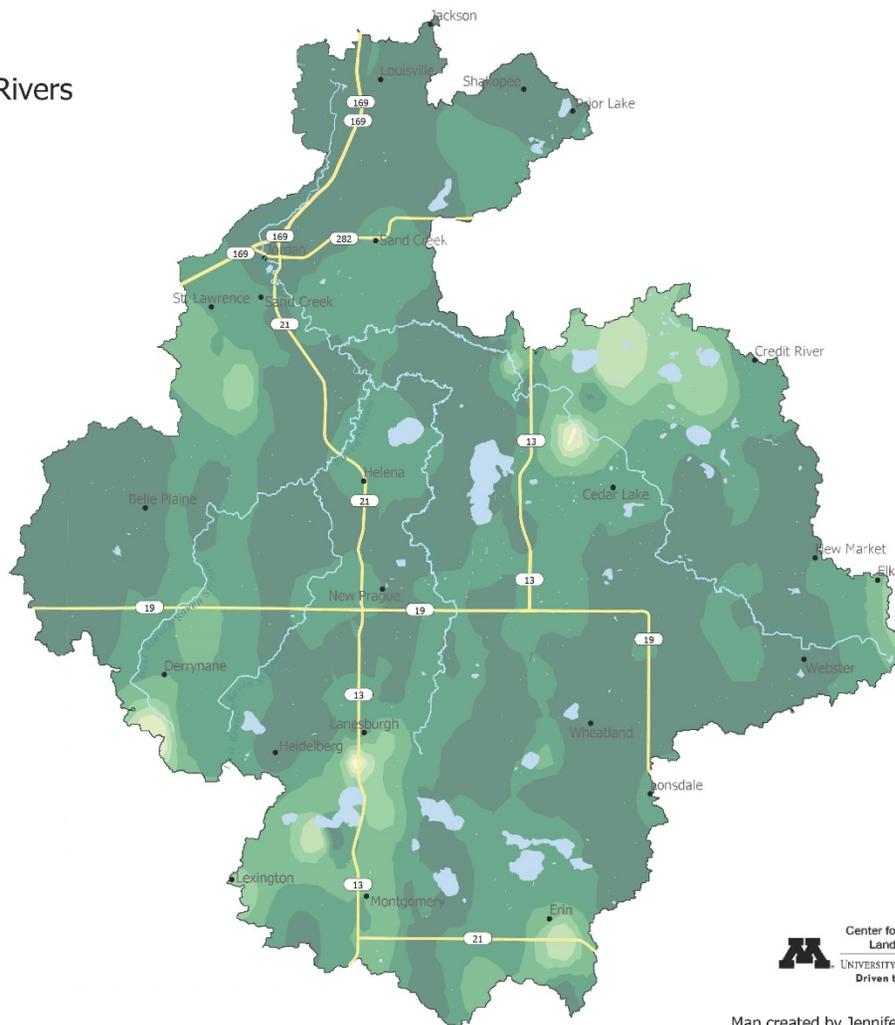
n = 398

- Cities and Townships
- Major streams
- Major roads
- Lakes
- Sand Creek Watershed

Level of importance:

- Very unimportant
- Neither important nor unimportant or no data
- Very important

Social data was geospatially analyzed using the weighted distance interpolation method to protect individual respondent identities and privacy. Thus, shaded polygons represent a calculated statistical average of responses in a cluster of parcels and not individual responses or parcels.



Map created by Jennifer Moeller
Source: Survey Question #2e, Your Perspectives on Local Water Resources

Map 6. Respondents' beliefs that conservation practices protect aquatic life

Conservation Practices Protect Aquatic Life

Landowner Survey in Sand Creek Watershed, Minnesota, USA 2018

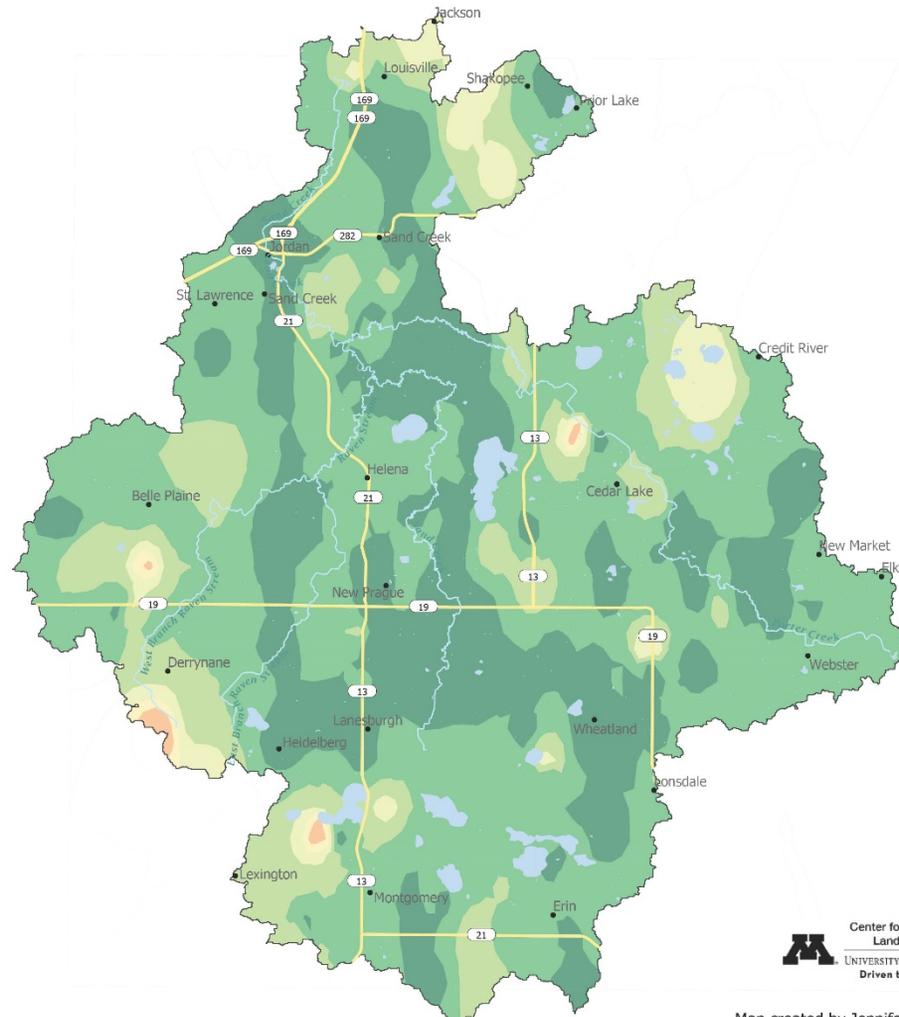
n = 398

- Cities and Townships
- Major streams
- Major roads
- Lakes
- Sand Creek Watershed

Level of agreement:

- Strongly disagree
- Neither agree nor disagree or no data
- Strongly agree

Social data was geospatially analyzed using the weighted distance interpolation method to protect individual respondent identities and privacy. Thus, shaded polygons represent a calculated statistical average of responses in a cluster of parcels and not individual responses or parcels.



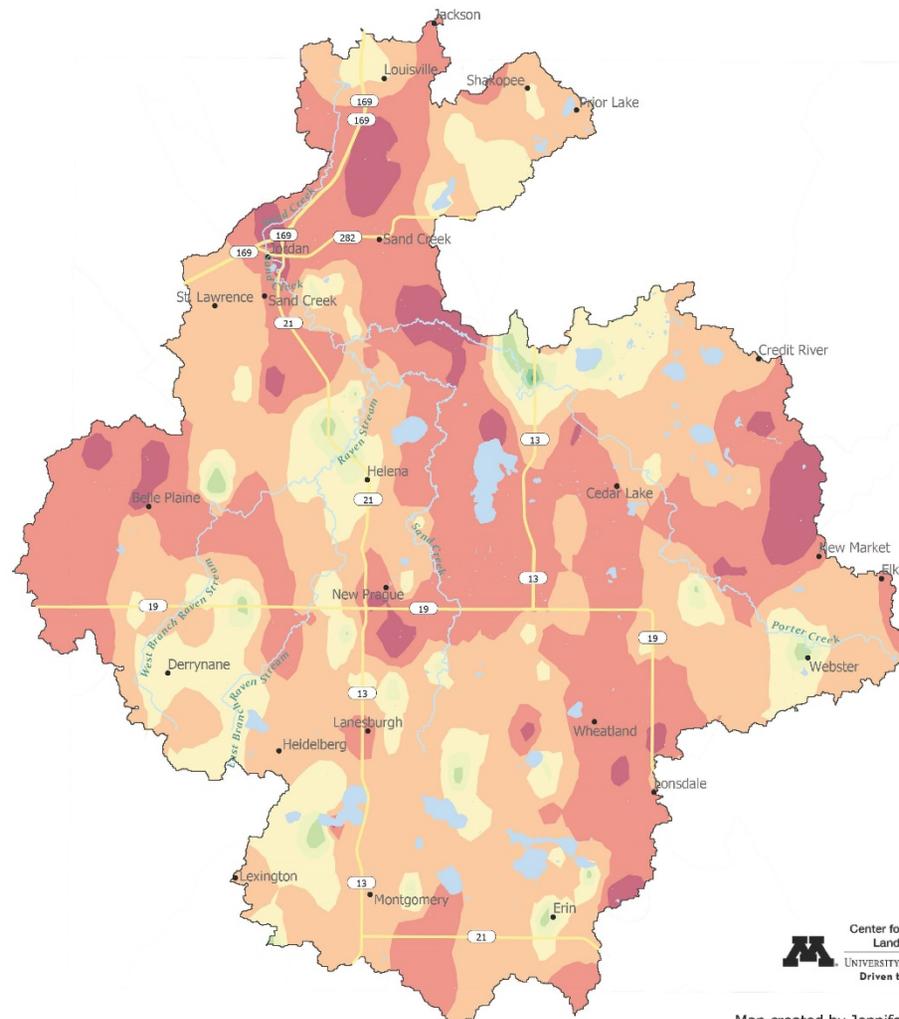
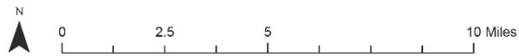
Map created by Jennifer Moeller
Source: Survey Question #3h, Your Perspectives on Local Water Resources

Map 7. Respondents' beliefs about their role in water resource protection

What I do on my land doesn't make much difference in overall water quality
 Landowner Survey in Sand Creek Watershed, Minnesota, USA 2018
 n = 398

- Cities and Townships
 - Major streams
 - Major roads
 - Lakes
 - Sand Creek Watershed
- Level of agreement:
- Strongly disagree
 - Neither agree nor disagree or no data
 - Strongly agree

Social data was geospatially analyzed using the weighted distance interpolation method to protect individual respondent identities and privacy. Thus, shaded polygons represent a calculated statistical average of responses in a cluster of parcels and not individual responses or parcels.



Map created by Jennifer Moeller
 Source: Survey Question #5g, Your Perspectives on Local Water Resources

Map 8. Respondents' future intentions to talk to others about conservation practices

Intention to Talk to Others About Conservation Practices

Landowner Survey in Sand Creek Watershed, Minnesota, USA 2018

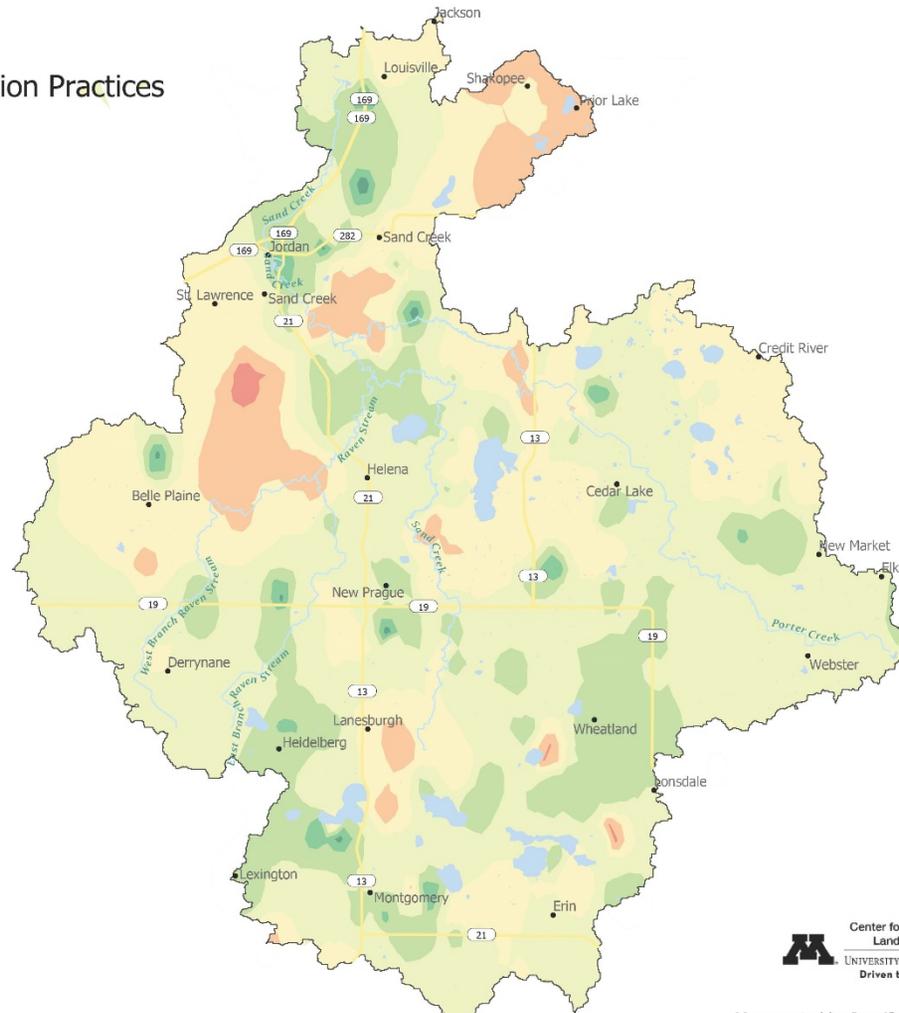
n = 398

- Cities and Townships
- Major streams
- Major roads
- Lakes
- Sand Creek Watershed

Level of intention to talk about future conservation practices:

- Most certainly not
- Uncertain or no data
- Uncertain or no data
- Uncertain or no data
- Most certainly will

Social data was geospatially analyzed using the weighted distance interpolation method to protect individual respondent identities and privacy. Thus, shaded polygons represent a calculated statistical average of responses in a cluster of parcels and not individual responses or parcels.



Map created by Jennifer Moeller

Source: Survey Question #10e, Your Perspectives on Local Water Resources

Map 9. Respondents' future intentions to use conservation practices on their land/property

Intentions to Use Conservation Practices on my land/property

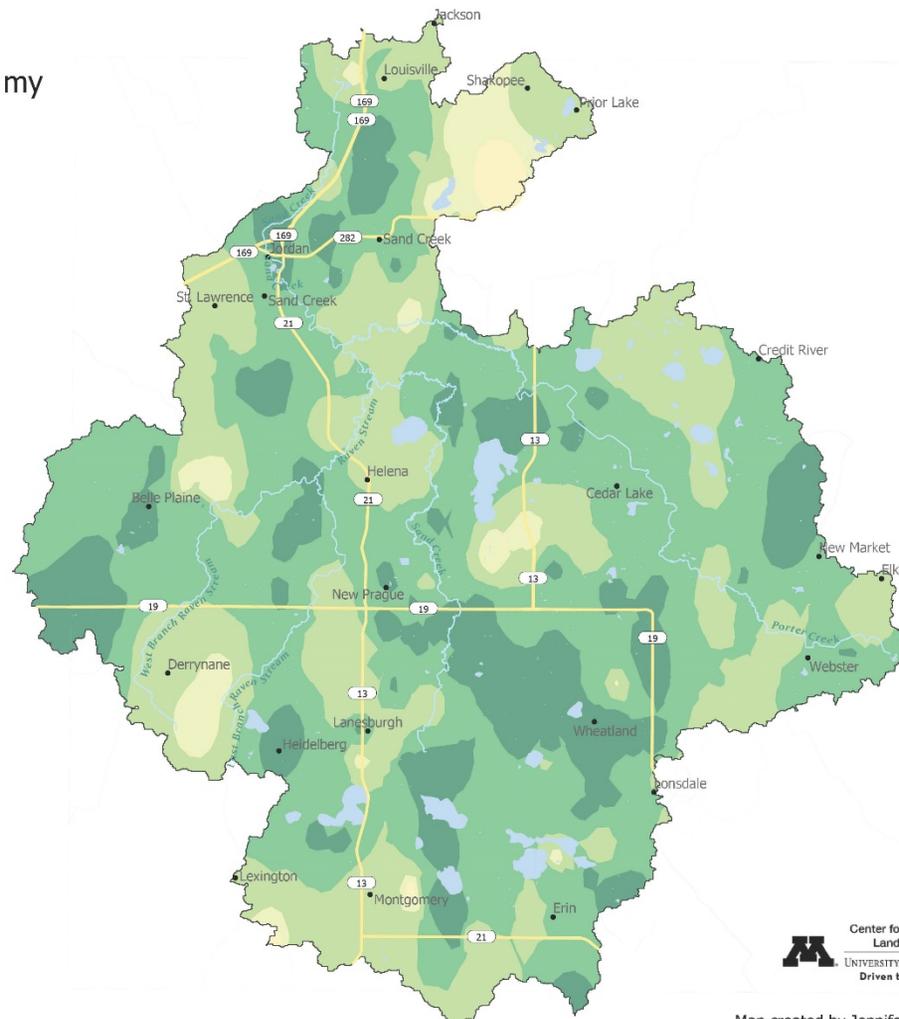
Landowner Survey in Sand Creek Watershed, Minnesota, USA 2018
n = 398

- Cities and Townships
- Major streams
- Major roads
- Lakes
- Sand Creek Watershed

Level of intentions to use future conservation practices:

- Most certainly not
- Uncertain or no data
- Most certainly will

Social data was geospatially analyzed using the weighted distance interpolation method to protect individual respondent identities and privacy. Thus, shaded polygons represent a calculated statistical average of responses in a cluster of parcels and not individual responses or parcels.



Map created by Jennifer Moeller
Source: Survey Question #10d, Your Perspectives on Local Water Resources

Appendix G. Scott County Watershed Management Organization Outreach 2011-2018

2011

Workshops

- 3 Blue Thumb workshops (raingardens) – 43 participants
- 1 Turf Maintenance for professionals & municipal employees – 50 participants
- 1 Turf Maintenance for residents – 20 participants
- 1 – (2 part workshop) Shoreline Restoration – 20 participants
- 1 Snow & Ice Control workshop – 20 participants

Additional Outreach

- Scott County Fair – (~25,000 participants); Outdoor Ed Days, 1,200; SCENE articles (8); WMO Summer Tour; Thank you cards to cost share program participants

2012

Workshops

- 12 Blue Thumb workshops – 52 attendees
- Land Care workshop - 15 attendees
- De-Icing workshop – 3 attendees

Events

- Free Nitrate Testing Clinic – 140 samples analyzed
- Thank You Event – 300 attendees
- Credit River Delisting – 30-40 attendees
- Cedar Lake Shoreline Buffer volunteer planting – 150 volunteers

Additional Outreach

- Scott County Fair – (~25,000 participants); Outdoor Ed Days, 1,200; SCENE articles (42 by SWCD & 4 by SWMO); WMO Summer Tour; SWCD Conservation Days; Credit River Success Story pamphlet; Thank you cards to cost share program participants

2013

Workshops

- 11 Blue Thumb workshops – 75 attendees
- Residential lawn care & composting workshops at Conservation Days – low attendance

Events

- Free Nitrate Testing Clinic – 90 samples analyzed
- Carp Tournament – 8 boats
- Conservation Days – 300 attendees
- Cedar Lake Wetland Buffer volunteer planting – 50 volunteers showed up – cancelled due to rain and lightening

Additional Outreach

- Scott County Fair – (~25,000 participants); Outdoor Ed Days, 1,300; SCENE articles (32); WMO Summer Tour; Storytelling training for employees; Thank you cards to cost share program participants

2014

- “Clean Water Starts With Me!” campaign starts – booth at 12 events and all workshops

Workshops

- 3 Native Grass planting workshops – 225 attendees
- 4 Blue Thumb – 50 attendees
- 2 Restore Your Shore – 68 attendees
- Cover Crop, Soil Health workshop – 44 attendees

Events

- Savage Wetland Enhancement volunteer planting – 40 volunteers

Additional Outreach

- Scott County Fair – (~25,000 participants); Outdoor Ed Days, 1,300; SCENE articles (36); WMO Summer Tour; Conservation Days (600); Thank you cards to cost share program participants

2015

Workshops

- 3 Native Grass planting workshops – 91 attendees
- 1 Blue Thumb – 19 attendees

Events

- “Clean Water Starts With Me!” - @ 11 events plus workshops
- Conservation Days – 700 attendees

Additional Outreach

- Scott County Fair – (~25,000 participants); Outdoor Ed Days, 1,300; SCENE articles (41 including 3 landowner success stories); WMO Summer Tour; Thank you cards to cost share program participants

2016

Workshops

- 1 Native Grass planting workshops – 15 attendees
- 2 Blue Thumb – 32 attendees
- 1 Soil Health workshop – 8 attendees

Events

- Sand Creek shoreline volunteer planting

Additional Outreach

- Scott County Fair – (~25,000 participants); Outdoor Ed Days, 1,200; SCENE articles (39); WMO Summer Tour; Thank you cards to cost share program participants

2017

Workshops

- 1 Native Grass planting workshops – 27 attendees
- 1 Blue Thumb – 13 attendees
- 1 Cover Crop workshop – 78 attendees
- 2 Restore Your Shore – 38 attendees
- 1 Maintain Your Prairie workshop – 14 attendees

Events

- Cover Crop Field Day –
- 4 Buffer Law Open Houses
- Sand Creek shoreline volunteer planting @ Golf Course > 30 volunteers
- “Clean Water Starts With Me!” - @ 5 events plus workshops

Additional Outreach

- StoryMap produced re: Sand Creek
- Scott County Fair – (~25,000 participants); Outdoor Ed Days, 1,500; SCENE articles (55); WMO Summer Tour; Thank you cards to cost share program participants

2018

Workshops

- 1 Native Grass planting workshops – 21 attendees
- 1 Cover Crop workshop (multi-county) –130 attendees
- 1 Restore Your Shore – 6 attendees
- 5 Smart Salting Winter Maintenance workshops – 59 attendees

Events

- Thank You Event for landowners- ~200 attendees

Additional Outreach

- Scott County Fair – (~25,000 participants); Outdoor Ed Days, 1,500; SCENE articles (39); WMO Summer Tour; Thank you cards to cost share program participants
- Private well testing for arsenic, atrazine, chloride & nitrates – 34 participants