THE VALUE OF WATER IN THE TWIN CITIES

August 2024

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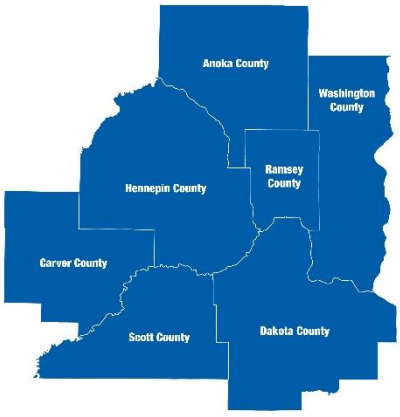

The Metropolitan Council is the regional planning organization for the seven-county Twin Cities area. The Council operates the regional bus and rail system, collects and treats wastewater, coordinates regional water resources, plans and helps fund regional parks, and administers federal funds that provide housing opportunities for low- and moderate-income individuals and families. The 17-member Council board is appointed by and serves at the pleasure of the governor.

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A Community-Centered Framework of the Value of Water in the Twin Cities

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We thank University of Minnesota staff and graduate and undergraduate research assistants with the Center for Changing Landscapes: Kowsar Mohamed, Olivia Tuisl, Oumar Nabe, Mia Jax, and Eddy Olson-Enamorado for their assistance with the onsite survey implementation. We are particularly grateful for the onsite survey participants who shared their perspectives with us.

We also thank the many community leaders and water resource professionals who participated in the policy co-development workshops for their openness and enthusiasm to share their experiences and perspectives with the project team and each other.

This project was funded by the Metropolitan Council through Contract No. 20I071, signed November 17, 2020.

The University of Minnesota Twin Cities is located on traditional, ancestral, and contemporary lands of Indigenous peoples. The University is in Dakota Oyate, the ancestral land of the Ocheti Sakowin and sacred land of the Dakota People. The Center for Changing Landscapes respects this land, acknowledges the harms and mistakes of the past, and is committed to moving forward in respectful partnerships with Indigenous peoples as we search for collective healing and true reconciliation and as we honor the land and water together.

Contents

Tables and Figures

Report Overview and Project Background

This report outlines findings from a four-year research project conducted by University of Minnesota (UMN) researchers in collaboration with the Metropolitan Council (hereafter Council), with funding from the Council's Community Development and Environmental Services Division. The study area includes the Twin Cities Metropolitan Area 7-county region.

In 2019, staff from the Council's Environmental Services Division engaged with researchers from the Center for Changing Landscapes and Humphrey School of Public Affairs, University of Minnesota (UMN), to discuss the Council's desire to better understand and represent the perspectives of socially and culturally diverse residents and their water relationships. The project's goals are to uplift the perspectives and experiences of Twin Cities Metro Area residents, especially socially marginalized groups with the aim of representation justice in water policy and planning. Davenport et al. (2023, pg. 289) define representation justice in water as policy, planning, and management in which "people should reasonably expect that the diversity of water relationships and values of community members are fairly deliberated and equitably represented among those in power." To center representation justice in our science, the UMN team committed to using rigorous and inclusive social science research methodologies to gather and share different narratives of water from and with communities and community leaders across MSP with the goal of better representing communities and influencing water policy, programming, and investments towards water justice.

In 2021-2022, UMN researchers conducted a survey of Twin Cities Metro Area residents. Our original study design directed us to survey residents onsite, at community events. However, because of the 2019 COVID pandemic and associated restrictions, an onsite survey was no longer possible. Instead, we administered a mail survey of residential households in the Twin Cities Metro Area to learn more about residents' understanding of their water supply, perceived threats or concerns related to water services, familiarity with their water bill and local issues related to water in their communities. A detailed account of Phase I (2020-2022) work is presented in a separate technical report (Roth et al. 2022).

This report presents findings from the second phase of social science research conducted as part of the larger two-phase project. This report describes three research activities conducted in Phase II from 2022-2024:

- Twin Cities Metropolitan Area Municipal Surveys: A Review of Water Insights
- Water Values in the Twin Cities Metropolitan Area
- Water Policy Co-Development Workshops

The report is organized in three sections, each section reports on an activity and was written by project PIs and co-authors.

SUGGESTED CITATIONS

Full report:
Davenport, M.A., Keeler, B., Roth, S., Rogers, M., Niehoff, E., Kreiter, A., Keller, M., Pradhananga, A., Delgado-Ortiz, G. (Eds). (2024). *The Value of Water in the Twin Cities*. A report prepared for the Metropolitan Council, St. Paul, MN. 126 pgs.

Sections/Activity reports:
Rogers, M., Keeler, B., & Niehoff, E. (2024). Twin Cities Metropolitan Area municipal surveys: A review of water insights. In M.A. Davenport & B. Keeler (Eds.), *The Value of Water in the Twin Cities*. A report prepared for the Metropolitan Council, St. Paul, MN. (pp. 1-5).

Kreiter, A., Davenport, M.A., Roth, S., Keller, M., Pradhananga, A., & Delgado-Ortiz, G. (2024). 2023 Water values in the Twin Cities Metropolitan Area. In M.A. Davenport & B. Keeler (Eds.), *The Value of Water in the Twin Cities*. A report prepared for the Metropolitan Council, St. Paul, MN. (pp. 6-21).

Roth, S. & Davenport, M.A. (2024). Water policy co-development workshops. In M.A. Davenport & B. Keeler (Eds.), *The Value of Water in the Twin Cities*. A report prepared for the Metropolitan Council, St. Paul, MN. (pp. 22-37).

TWIN CITIES METROPOLITAN AREA MUNICIPAL SURVEYS: A REVIEW OF WATER INSIGHTS

REVIEW AND SYNTHESIS OF WATER SURVEYS 2013-2023

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1. Background:

Clean water consistently ranks among the top environmental concerns in public surveys of the US population (Funk & Hefferon 2019, Crabtree 2023). Researchers from the University of Minnesota have been conducting surveys, focus groups, and community outreach related to the values for water quality and quantity for several years with an aim to inform more strategic water resource management in Minnesota. Findings from statewide surveys and community engagement reflect national trends, with high stated concern for water resources across a diversity of water values and uses (Davenport et al. 2024).

We obtained existing survey data collected by local municipalities, counties, and watershed organizations across the Twin Cities metropolitan region in order to collect additional insights into values and preferences for water resources. These locally-administered surveys are designed to understand the values and preferences of residents and ratepayers across a range of social, economic, and environmental topics. We were interested in responses related to questions about water resources and the quality and reliability of water services.

In this brief, we report on our findings from a review of existing surveys conducted by water utilities, municipalities, and related entities over the last 10 years in the Twin Cities. We focus our analysis on questions related to household awareness of water issues, perceived threats or concerns related to water supply, and values or priorities for clean water programming, funding, or infrastructure. We compared the results from metro area surveys to water-related surveys conducted on regional or national populations in order to identify notable trends in water values and preferences across types of water service providers, geography, or by water source.

2. Summary of Findings:

We obtained residential surveys conducted by municipalities, counties, and watershed districts over the last ten years from entities representing approximately 70% of metro area residents (see list of surveys in Appendix A). The most common water-related question on these surveys asked residents about the quality and dependability of their water supply. Our review found that 76% of metro area respondents viewed their water supply as “excellent” or “good”. Similarly, 73% of respondents perceived water resources in their community as “excellent” or “good”. We found exceptions to these positive perceptions of water resource quality and water service delivery, primarily in communities where there has been significant media attention of localized water quantity or quality issues. On average, reported satisfaction with water resources in metro area communities exceeded national averages from surveys asking similar questions of U.S. households.

Surveys also suggest that water resources positively impact quality of life in metro area communities. For example, parks and lakes were rated among the “most liked attributes” of living in metro area counties. Similarly, residential surveys in the Twin Cities found that the quality of water in lakes and streams and the quality of drinking water were among the highest ranked environmental concerns.

Insights from a review of national surveys suggest that persistent disparities remain in access to a clean and safe water supply and in perceptions of water quality, especially among minority households. National surveys also suggest that receiving regular communication from water service providers increased positive perceptions of the quality of the local water supply and increased stated satisfaction with water services (American Water Works Association 2023).

3. Recommendations:

Municipalities conducting future surveys of residents and ratepayers may consider integrating one or more of the water-related questions we identified in our review (see list in Appendix B). In particular,

future surveys could contribute needed data on the consumption of bottled water versus tap water, perceived health or safety risks associated with degraded water quality, and preferences for further public investments in water resource management. Survey instruments should be designed to facilitate the comparison of water values, preferences, and behaviors among different demographic groups. Collaboration with survey providers such as Polco or Morris Leatherman – and water planning organizations like the Metropolitan Council and surrounding watersheds - to develop standardized question formats across municipalities and survey instruments would facilitate cross-city or region comparisons.

4. Methodology:

The project was initiated in summer of 2023 with the support of the Metropolitan Council. We sought contact information for metro area cities, counties, and watershed organizations in the Twin Cities metro through web searches and network requests. In 2023, we emailed over 200 metro area contacts asking for existing survey data, collected within the last 10 years that may include questions related to water (see Appendix C for copy of email request). We also collected survey data via public documentation where surveys were made available on city or county websites.

In total, we obtained data for 3 of 7 metro area counties and 59 of 182 metro area communities, covering approximately 70% of the metro area's population (Figure 1). Appendix D includes a table of the municipalities and counties where we were able to obtain some survey data.

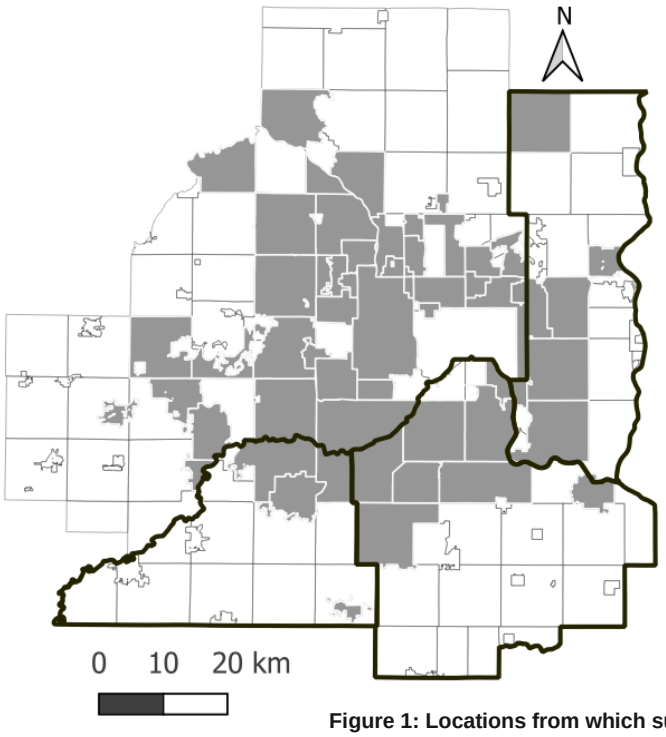

Figure 1: Locations from which surveys were obtained

We also searched academic literature and publicly available web resources for national surveys that included questions about water quality, quantity, or water resources. A review of water-related surveys conducted by the U.S. Department of Housing and Urban Development in 2022 identified national survey resources that we included in our review (Sarkar, M. & SP Group LLC 2022). We reviewed the following national surveys for insights into water quality perception, values and uses:

- ***American Housing Survey*** **(sponsored by U.S. Department of Housing and Urban Development, conducted by the U.S. Census Bureau)**:[1] This is a longitudinal housing unit survey that gathers data about the quality of housing in the United States every two years. Interviews are conducted in person or by telephone. Housing units participating in the survey have been scientifically selected to represent a cross section of all housing in the nation. In a 2018 paper, Javidi & Pierce (2018) used this survey to examine "U.S. Households' Perception of Drinking Water as Unsafe and its Consequences".

[1] For more details on AHS, visit: https://www.census.gov/programs-surveys/ahs.html

- ***National Health and Nutrition Examination Survey* (Centers for Disease Control)**:[2] This is a survey designed to assess the health and nutritional status of the civilian population in the United States through a nationally representative sample of about 5,000 persons each year. The sample design is periodically changed to include larger numbers of certain subgroups (e.g. Hispanic persons, non-Hispanic black persons, elderly persons) to increase the reliability and precision of estimates of health status for these subgroups. Households are invited to participate through a letter, with an online questionnaire completed to see if anyone in the household is eligible to participate. Data is then collected through telephone interviews and in-person physical exams. Data is released in 2-year cycles. We reviewed an analysis of this survey published by Rosinger et al. (2018) investigating racial and ethnic disparities in plain, tap and bottled water consumption among US adults from 2007-2014.
- ***American Community Survey* (U.S. Census Bureau)**:[3] This annual survey collects information on social, economic, housing, and demographic characteristics, with 3.5 million households (about 1 in 38) notified each year by mail. Addresses are selected to ensure geographic coverage. The survey can be completed online or by mail. The Census Bureau asks respondents with incomplete surveys or those that need clarification to complete a telephone follow-up. A sample of non-respondents are contacted by a Census Bureau representative to conduct the interview in person. Data is released by 1-year and 5-year estimates. Overall response rates are between 85-97%, with a drop to 71% in 2020. Cardoso & Wichman used data from the 2016 5-Year American Community Survey in their 2022 analysis of water affordability in the United States.
- ***Public Perceptions of Tap Water* (American Water Works Association [AWWA])**:[4] This national survey has been conducted annually since 2020 and focuses on adults with access to public drinking water at home. The interviews are conducted online. Data are weighted to approximate a target sample of adults with public water supply based on age, gender, race, educational attainment, region, gender by age, and race by educational attainment. The sample size ranges from 1,940 to 2,022 people.
- ***U.S. Public Views on Climate and Energy* (Pew Research Center):**[5] This survey, conducted in October 2019, reached out to 3,954 people and received 3,627 responses, for a response rate of 91.7%. This group of people was selected from the Pew Research Center's American Trends Panel, a nationally representative panel of randomly selected U.S. adults. Panelists who do not have internet access at home are provided with a tablet and wireless internet connection. Responses for this survey were collected via a self-administered web survey. We reviewed this survey to understand public perceptions of water quality issues relative to other environmental issues of concern.

5. Findings:

Municipalities, counties, and watershed districts conduct surveys for a variety of purposes, not all related to water resources. Appendix B includes an inventory of water related questions we found after reviewing recent metro area surveys. We identified four main types of surveys that included questions about residents' perceptions and use of water, including:

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[2] For more details on NHANES, visit: https://www.cdc.gov/nchs/nhanes/about_nhanes.htm

[3] For more details on ACS, visit: https://www.census.gov/content/dam/Census/programs-surveys/acs/about/ACS_Information_Guide.pdf

[4] For the full AWWA 2023 report, visit: https://www.awwa.org/Portals/0/AWWA/Communications/2023PubPerceptionSurvey/Public-Perceptions-of-Tap-Water-Survey-23-Slides.pdf

[5] For the full Climate and Energy report, visit: https://www.pewresearch.org/science/wp-content/uploads/sites/16/2019/11/PS.11.25.19_climate-energy-FINAL.pdf

- **Quality of Life Surveys**: These surveys are typically conducted as part of the Minnesota Local Performance Measurement Program.[6] In these surveys, residents are asked about their perceptions of the quality and dependability of their water supply.
- **Health Surveys**: These surveys occasionally included questions about water access and the impacts of water quality on human health.
- **Investment Surveys**: These surveys are conducted by municipalities who are looking to residents to inform investment decisions, including potential investments in water infrastructure and natural water resource management.
- **Other ad hoc surveys**: These surveys may address specific behaviors or values or relate to pressing local issues. Water-related questions addressed topics such as lawn watering, stormwater management, and water conservation.

Given the idiosyncratic nature of these surveys, there were only two water-specific questions that occurred in a sufficient frequency and consistency to facilitate comparison. Several surveys (n = 49) asked respondents to rate the quality and dependability of their water supply and a smaller number of surveys asked respondents to rate the quality of the water resources in their community (n = 18). The table in Appendix D lists each municipality and the percentage of respondents who responded positively to these two common water-related questions.

In summary, we observed that:

- **76%** of respondents rated the quality and dependability of their **city water supply** as excellent or good (min 41%, max 100%, n=49).
- **73%** of respondents rated the quality of the communities **water resources** as excellent or good (min 47% max 93%, n=18)

Comparatively, 65% of U.S. adults surveyed by the American Water Works Association (AWWA) rated their public water supply as excellent or good (2023). This suggests that, on average, metro area residents have a higher than average level of satisfaction with the quality of public water supplies compared to US averages. We also observed some municipalities where perceptions of water quality were lower than metro or national averages (see Appendix D).

[6] Created by the Council on Local Results and Innovation in 2012, this is a program for cities or counties to receive a reimbursement per capita if certain criteria are met. More information can be found at: https://www.osa.state.mn.us/forms-deadlines/forms/performance-measurement-program/

WATER VALUES IN THE TWIN CITIES METROPOLITAN AREA

2023 ONSITE SURVEY RESEARCH

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1. Study Background

This study report outlines findings from a 2023 survey effort conducted in the seven-county Minneapolis-St. Paul Metropolitan Area (MSP) in collaboration with the Metropolitan Council (hereafter Council), with funding from the Council's Community Development and Environmental Services Division. The report presents findings from the second phase of social science research conducted as part of a larger two-phase study. A detailed account of Phase I (2020-2022) work is presented in a separate technical report (Roth et al. 2022).

In 2019, staff from the Council's Environmental Services Division engaged with researchers from the Center for Changing Landscapes and Humphrey School of Public Affairs, University of Minnesota (UMN), to discuss the Council's desire to better understand and represent the perspectives of socially and culturally diverse residents and their water relationships. This work aims to uplift the perspectives and experiences of socially marginalized groups across race, ethnicity, gender identity, and income, with the goal of elevating representation justice. Davenport et al. (2023, pg. 289) define representation justice as water policy, planning, and management in which "people should reasonably expect that the diversity of water relationships and values of community members are fairly deliberated and equitably represented among those in power." To center representation justice in our science, the UMN team committed to using rigorous and inclusive social science research methodologies to gather and share different narratives of water from and with communities and community leaders across MSP with the goal of better representing communities and influencing water policy, programming, and investments towards water justice.

Exploring water relationships in MSP requires a critical examination of the marginalization of residents and communities across racial and ethnic identities and income. Cultural knowledge holders, elders, and community organizers have long recognized the intergenerational traumas and harms caused by racist, unjust, and discriminatory urban planning policies and land use practices. The effects of historical institutional racism on how water in the built and natural environment has been planned for, managed, and invested in has had cascading social, cultural, and ecological consequences that continue today (Davenport et al., 2023; Walker et al., 2023). These include sociocultural inequities in access to benefits and exposure to burdens, in planning and community engagement processes, and in representation in decision-making. Social science research supports representation justice in water planning and policy by engaging community members across diverse water relationships. Our approach applied multiple research and engagement methods to gather water narratives, including water values, beliefs, concerns, and actions among residents in the MSP region. In both phases of the research, we aimed to particularly engage residents who identify as Black, Indigenous, or People of Color (BIPOC) through inclusive research designs.

In 2019, in collaboration with Council staff, we planned for in-person, face-to-face engagement with community members throughout 2019 and 2020. However, plans for onsite data collection at community events were thwarted by the COVID-19 pandemic. State policies restricted gatherings, and events across the MSP were canceled or postponed for up to two years. As a result, we adapted our research methodology to engage with residents through USPS mail. We designed our mail survey sampling strategy to target neighborhoods with higher proportions of BIPOC residents and where known water planning and management challenges existed throughout the region (see map in Appendix F). The results of this effort yielded 622 responses and a response rate of 36%. While we had strong geographic representation across different MSP neighborhoods, our respondent pool lacked socio-cultural representation across race/ethnicity, gender identity, and home ownership/renter status. Respondents were predominantly white, male homeowners (Table 1).

The mail survey study in 2021 became Phase I of this project. In 2022, with the help of additional funding and as the COVID-19 pandemic threat lessened and in-person community gatherings resumed across MSP, our team began planning for onsite survey implementation which we launched at select community events in 2023.

2. Inclusive Research Methods

We developed the onsite survey study design in consultation with Council staff and community partners. The UMN research team administered surveys in-person via digital tablets at community events across MSP. We set out in the spring with the goal of collecting 1,000 survey responses. For the onsite survey (Appendix G) platform, we used the UMN-licensed Qualtrics (Qualtrics, Provo, UT) application.

Community and cultural events

Research staff administered the survey at 14 events from May to October 2023. This study employed a purposive convenience sampling method, meaning we selected community events to represent culturally diverse community members but within each event respondents approached our survey station at their convenience. All those who approached our survey station who were 18 years of age or older were invited to participate. The event selection process began in Spring 2023 with an inventory of cultural and neighborhood events around the MSP area. The event list was informed by several sources including the results of a 2019 field study focusing on MSP resident perceptions of stormwater (Davenport et al., 2023; Roth et al., 2021), which similarly targeted cultural events; we selected those events that had generated a large number of responses and were being offered in 2023. We also had discussions with Council staff and community partners to identify events across cultures and communities. Lastly, internet searches helped fill gaps to engage cultural groups and neighborhoods not yet represented in our inventory. For each event, UMN researchers contacted event organizers, explained the purpose of the study, requested permission to set up a survey administration station at the event, and paid a tabling fee if required (per each event's booth policy). We also asked for advice on respectful ways to engage with event attendees at each event. A full list of events can be found in Appendix H.

Onsite, face-to-face surveys

University of Minnesota Institutional Review Board trained and certified research staff set up the survey stations and prepped tablet devices for survey administration. The survey station included an interactive all-ages bead and jar "voting" in which attendees could select water values that were particularly important to them. To improve participation rates and compensate participants for their time, a $2 bill was offered as a cash incentive to respondents (18 years of age or older). The survey also was available in a Spanish translation, and select events had multilingual staff available (see Appendix H for a full list of events and languages spoken by research staff) to translate the survey for participants. Survey station informational signs were printed in English, Spanish, and Somali. Completed tablet survey responses were automatically logged into a password-protected database within the Qualtrics software.

Data analysis

We conducted basic descriptive statistical analysis on the total sample of onsite survey respondents to summarize frequencies and proportions of responses distributed across response options, as well as averages (e.g., means and medians) and variability around the mean (standard deviation). We also conducted subgroup statistical comparisons (independent samples t-tests, analysis of variance tests, and chi-square tests) across:

- Race and ethnicity (comparing White-Only to a grouped BIPOC category and comparing across five racial/ethnic identities including Black or African American; Asian; Hispanic, Latino or Spanish heritage; American Indian or Alaska Native; and White);
- Age ("younger" and "older" groups, split at the median of 36 years);

- Gender identity; and
- Homeownership status (renter and homeowner).

The comparisons across five racial/ethnic identities included respondents who selected one category only and not those who selected more than one race/ethnicity. In addition, because of small sample sizes, we were not able to conduct specific subgroup comparisons with responses from Middle Eastern or North African respondents or from Native Hawaiian or other Pacific Islander respondents. However, these respondents are represented in the grouped BIPOC category, as are respondents who identified as more than one race/ethnicity. The non-binary/gender non-conforming identity subgroup sample size also was too small to include in statistical comparisons. Subgroup differences for t-tests and chi-square tests are reported as significantly different at alpha levels of ≤ 0.01 (i.e., less than or equal to 1% probability that a difference occurs by chance). ANOVA was conducted using Tukey's post hoc test and significant differences are reported at alpha levels of ≤ 0.05.

3. Findings

After removing cases of respondents who reside outside of the MSP seven-county ZIP code areas, the Phase II survey closed with 1,052 total respondents. Basic descriptive statistical results are presented in the following section, and selected subgroup comparisons are presented in Section 3.2. A map of respondents' residences by zip code is presented in Appendix I. Full descriptive and inferential statistics in tabular form are presented in Appendix J.

What are respondents' social and cultural backgrounds?

The onsite survey administered in 2023 represents greater social and cultural diversity of MSP residents than the Phase I mail survey administered in 2021 (Table 1). More than two-thirds (67%) of respondents identify as one or more of the BIPOC categories, 55% identify as female, and the median age of respondents is 36 years old. Twenty percent or more of respondents identify as Black or African American (22%) or Asian (20%). Eleven percent identify as Hispanic, Latino, or Spanish heritage, and 8% identify as American Indian or Alaska Native. Respondents could check as many race and ethnicity categories as apply to them; 15% of respondents selected the multiracial or biracial category or selected more than one race or ethnicity category. This project also captured an almost equal number of renters and homeowners (47% renters, 46% owners, 7% selected "other" option). It is important to note that respondents have multiple identifying characteristics that intersect and may influence water relationships. For example, more than three-fourths of the American Indian or Alaska Native respondents identify as female (77%). About two-thirds of Black or African American (65%) and American Indian or Alaska Native (67%) respondents are renters (Table 3).

Table 1. Sociodemographic background comparisons of Phase I and Phase II survey respondents

	Phase I (MSP mail survey)	**Phase 2 (MSP onsite survey)**	MSP population*
Grouped BIPOC category identifying	6.4%	66.6%	29.6%
Female identifying	38.7%	55.3%	50.6%
Median age	57	36	-
Median household income	$100,000 - $149,000	$50,000 - $74,999	$94,673
Rent home	21.9%	46.7%	30.8%

*Source: U.S. Census data, 2022

Table 2. MSP onsite survey (Phase II) respondent sociodemographic background

Racial and Ethnic Identity*	MSP Onsite Survey	
Race/ethnicity categories	**Frequency**	**Percent of Respondents (n=983)**
White	372	36.7%
Black or African American	226	22.3%
Asian	203	20.0%
Hispanic, Latino, or Spanish heritage	113	11.1%
American Indian or Alaska Native	78	7.7%
Middle Eastern or North African (MENA)	8	0.8%
Native Hawaiian or Other Pacific Islander	8	0.8%
Multiracial or biracial	79	1.7%
A race/ethnicity not listed (write-in option)	17	3.1%
Sum of question responses	1104	
Grouped race/ethnic categories	**Frequency**	**Percent of Respondents (n=983)**
Total identifying as multiracial (i.e., selecting multiracial category or selecting more than one race/ethnicity categories)	150	15.3%
White-Only	328	33.4%
Grouped BIPOC category including multiracial	655	66.6%
Total question respondents	983	-
Non-responses and "Prefer not to respond" category	69	6.6%
Survey Respondent Total	1052	-
Gender Identity*	**Frequency**	**Percent of Respondents (n=1005)**
Female	570	56.7%
Male	389	38.7%
Non-Binary/Gender Non-Conforming	46	4.6%
Total question respondents	1005	100%
Non-responses and "Prefer not to respond" category	44	
Survey Respondent Total	1052	-

*Respondents could select more than one response

Table 3. Respondents' sociodemographic background by race/ethnicity

Totals	372 (37%)	113 (11%)	226 (22%)	203 (20%)	78 (8%)	8 (1%)	8 (1%)	1052 (112%)
	White	**Hispanic, Latino, or Spanish heritage**	**Black or African American**	**Asian**	**American Indian or Alaska Native**	**Middle Eastern or North African**	**Native Hawaiian or PI**	Totals
Female	189 (59%)	51 (61%)	87 (45%)	104 (61%)	37 (77%)	-	-	570 (57%)
Male	112 (35%)	30 (36%)	101 (53%)	65 (38%)	9 (20%)	-	-	389 (39%)
NB/GNC*	21 (7%)	3 (4%)	4 (2%)	2 (1%)	2 (4%)	-	-	46 (5%)
Home-owner	192 (62%)	39 (48%)	63 (35%)	88 (56%)	15 (33%)	-	-	397 (51%)
Renter	120 (38%)	42 (52%)	115 (65%)	69 (44%)	30 (67%)	-	-	376 (49%)

*nonbinary/gender non-conforming

Drinking water perceptions and behaviors

Survey participants were asked a series of questions about their household drinking water. Overall, most respondents (67%) reported getting their household drinking water from a public water supplier (e.g., city water from the tap), 29% reported that they primarily drink purchased bottled water, and 3% reported getting their water from a private well.

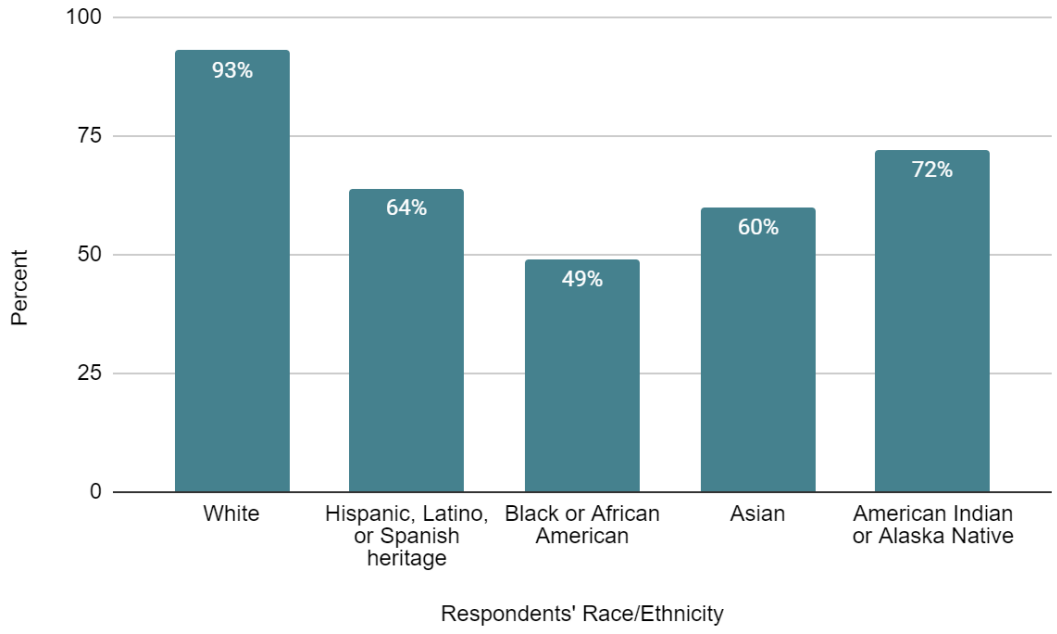

Figure 2. Percent of respondents who get their drinking water from the tap (public or private well source), by race/ethnicity.

Comparisons between a grouped BIPOC category and a White-Only category reveal that BIPOC respondents are significantly less likely to drink water from the tap (i.e., public supplier or private well) than White respondents. Subgroup comparisons show significant differences across racial and ethnic identities in how survey participants get their drinking water (Figure 2; Appendix K, Table K1). Black or African American participants were the least likely racial/ethnic group to report drinking water from the tap with slightly less than half doing so (49%). Fewer than two-thirds of respondents identifying as Asian (60%) or Hispanic, Latino, or Spanish heritage (64%) report drinking water from the tap. Seventy-two percent of American Indian or Alaska Native respondents and 93% of White respondents report drinking water from the tap. Subgroup comparisons across gender identity revealed no statistical differences in how respondents get their drinking water.

Participants were asked a variety of questions regarding the taste, safety, and accessibility of their household drinking water. Overall, more than half of respondents somewhat to strongly agreed with the statements, “I like the way the drinking water out of my tap tastes” (56%), and “I trust that my tap water is safe to drink” (58%). Altogether, a strong majority (81%) agreed that they “have reliable access to drinking water (i.e., water always flows when I turn on my tap).” At the same time, more than half of respondents (57%) expressed concern about contaminants in their drinking water and more than one-third (37%) worry a fair amount to a great deal about the safety of drinking water from their tap at home (Appendix J, Tables J6-7).

Subgroup statistical analysis revealed that there were no differences in concern about contaminants in drinking water across race/ethnicity subgroups. However, White respondents worry significantly less than all other racial and ethnic groups about the safety of their drinking water from the tap at home. Respondents identifying as Black or African American; Asian; Hispanic, Latino or Spanish heritage; or Native American or Alaska Native (not multiracial) are significantly less likely than White respondents to trust that their tap water is safe to drink, to enjoy the taste of their tap water, and to believe they have reliable access to drinking water at home (Appendix K, Table K2). This finding is consistent with past studies that found that white adults are more likely than Black or Hispanic adults to report that their water at home is safe, and that Hispanic households more commonly perceive their tap water to be unsafe (Javidi & Pierce, 2018; American Water Works Association, 2023).

In addition, renters were significantly less likely than homeowners to like the way their drinking water tastes, trust that their tap water is safe to drink, and report having reliable access to drinking water. Renters worry significantly more than homeowners about the safety of their drinking water (Appendix K, Table K4). Subgroup comparisons across gender identity and age revealed no statistical differences in concern or perceptions of drinking water.

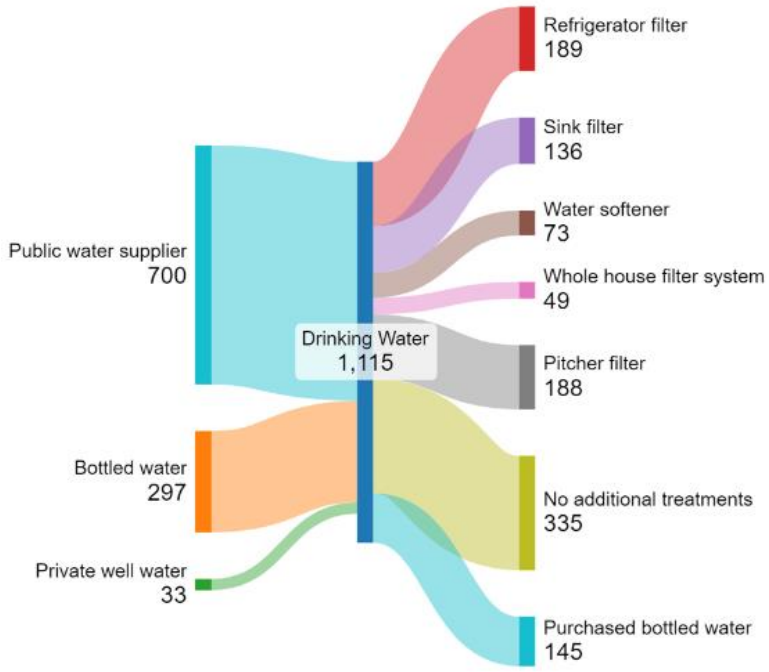

Figure 3. Survey participants' water supply and water filtration or treatment method

Participants were also asked whether they treat or filter their water at home (Figure 3). Participants were able to select more than one treatment option. Overall, 32% of respondents stated that they do not use any additional treatments on their drinking water, while a combined 49% reported using some filtration system: a refrigerator filter (18%), a pitcher filter (18%), and/or a sink filter (13%) (Appendix J, Table J5). White respondents are less likely than all other race/ethnicity groups to treat their water (Appendix K, Table K1).

Concerns about water in their communities

Respondents were asked to rate their concern about eight specific water issues on a five-point scale ranging from “not at all concerned,” to “extremely concerned.” The most concerning issues to respondents overall were “climate change impacts to water,” “lead pipe or lead exposure in my community’s drinking water,” and “water that is not safe for drinking.” BIPOC category respondents expressed significantly higher concern than White-Only category respondents on five of the eight water issues in their communities. White-Only category respondents expressed significantly higher concern than BIPOC category respondents about climate change impacts to water. The largest gaps in concern between BIPOC and White respondents were on “water that is not safe for drinking,” “flooding in my community,” and “water in my basement or home.” Twenty percent more BIPOC respondents than White-Only respondents expressed high concern (i.e., very to extremely concerned) about these issues (Figure 4; Appendix K, Tables K6-7). Subgroup comparisons indicate that Black or African American; Hispanic, Latino, or Spanish heritage; and Asian community members are significantly more concerned than White community members about flooding in their communities and water in their basements or homes. White respondents are significantly less concerned than all other racial/ethnic groups about sanitary sewer or septic system problems and water that is not safe for drinking

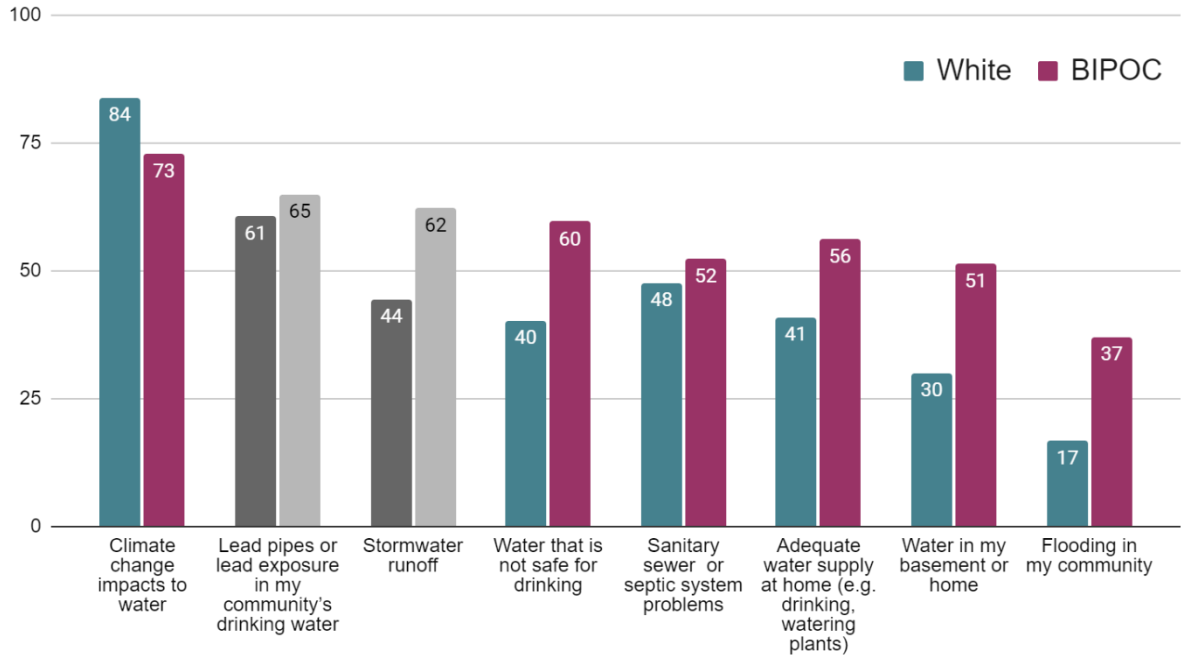

Figure 4. Percent of respondents reporting they are very or extremely concerned about water issues in their community by grouped BIPOC category and White-Only category. Grayed bars (i.e., "lead pipes…" and "stormwater runoff") indicate mean differences were not statistically different between subgroups.

Younger respondents had significantly higher concern than older respondents on six of the eight water issues; no statistical differences were detected across age in concern about water in their basement or home or flooding in their community (Appendix K, Table K9). Across homeownership, renters were significantly more concerned than homeowners about flooding in their community (Appendix K, Table K8). Subgroup comparisons across gender identity revealed no statistical differences.

Water knowledge and trust in information sources

Overall, participants rated their familiarity with water issues in or near their community as "slightly familiar" on average, and only 17% rated themselves as "very or extremely familiar" with water issues (Figure 5). However, participants believe that it is important for them to learn more about water issues, with 61% of respondents indicating that learning more about water issues in their community is "very or extremely important" (Appendix J, Tables J10-11).

Participants asked to rate 12 information sources with the prompt, "When it comes to water, to what extent do you trust or distrust the following sources of information?" on a five-point scale from "strongly distrust" to "strongly trust." Overall, environmental organizations, universities and other academic institutions, and local environmental agencies were the most trusted sources with an average rating of "somewhat trust" (mean 3.98-3.87). County government, federal government, and media were the least trusted sources with average ratings of "neither trust nor distrust" (mean 3.37-3.04) (Appendix J, Table J8). Trust in regional government (e.g., Metropolitan Council) fell in the middle as the ninth most-trusted source of information (mean 3.48).

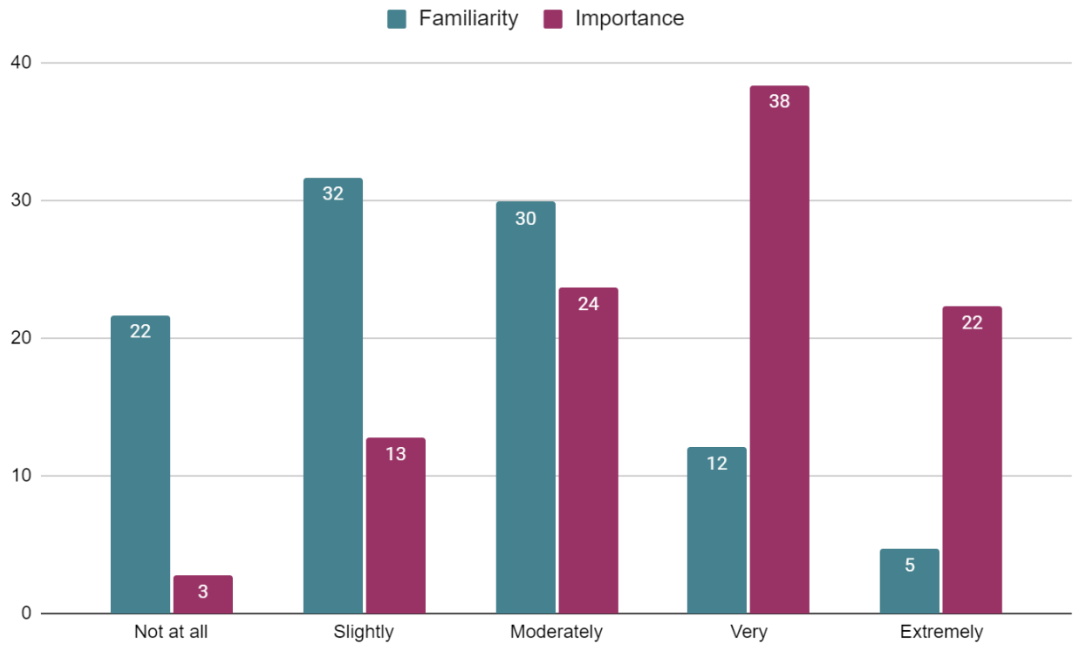

Figure 5. Respondents self-reported familiarity with local water issues and rated level of importance to learn more about local water issues (percent)

Subgroup comparisons by race and ethnicity revealed that Black or African American respondents and American Indian or Alaska Native respondents have significantly less trust than all other racial/ethnic groups in local, county, state, and federal governments as sources of water information. Overall, White and Asian identifying respondents are most trusting of the most sources of information about water (Appendix K, Table K10).

Homeownership status comparisons show several significant differences. Homeowners are significantly more trusting than renters of local, county, regional, state, and federal governments; local environmental agencies; universities; and environmental organizations as sources of water information (Appendix K, Table K11). Subgroup comparisons across gender identity and age revealed no statistical differences.

Water values

Participants were provided a list of 14 water values or uses and were asked “How important to you is it to protect lakes and rivers for the following water values or uses?” Participants answered on a five-point scale from “not at all important” to “extremely important.” The water values “future generations,” “equitable access to clean drinking water,” and “drinking water that is safe and clean,” were rated as the top three water values overall, with 10 out of the 14 values rated as at least “very important” on average (Appendix J, Table J9).

The top five water values were consistently rated as most important on average across all social and cultural subgroups compared (Figure 6). However, the importance of protecting certain water values varied between subgroups. For example, the seven highest-rated values overall were rated significantly higher in importance by White-Only category respondents than by BIPOC category respondents. The seven lowest values overall were rated significantly higher in importance by BIPOC category respondents than by White-Only category respondents (Appendix K, Table K13). Respondents identifying as Black or African American, Asian, or American Indian or Alaska Native placed significantly

higher importance on water “for cultural or religious practices” than White or Hispanic, Latino, or Spanish heritage respondents (Appendix K, Table K17).

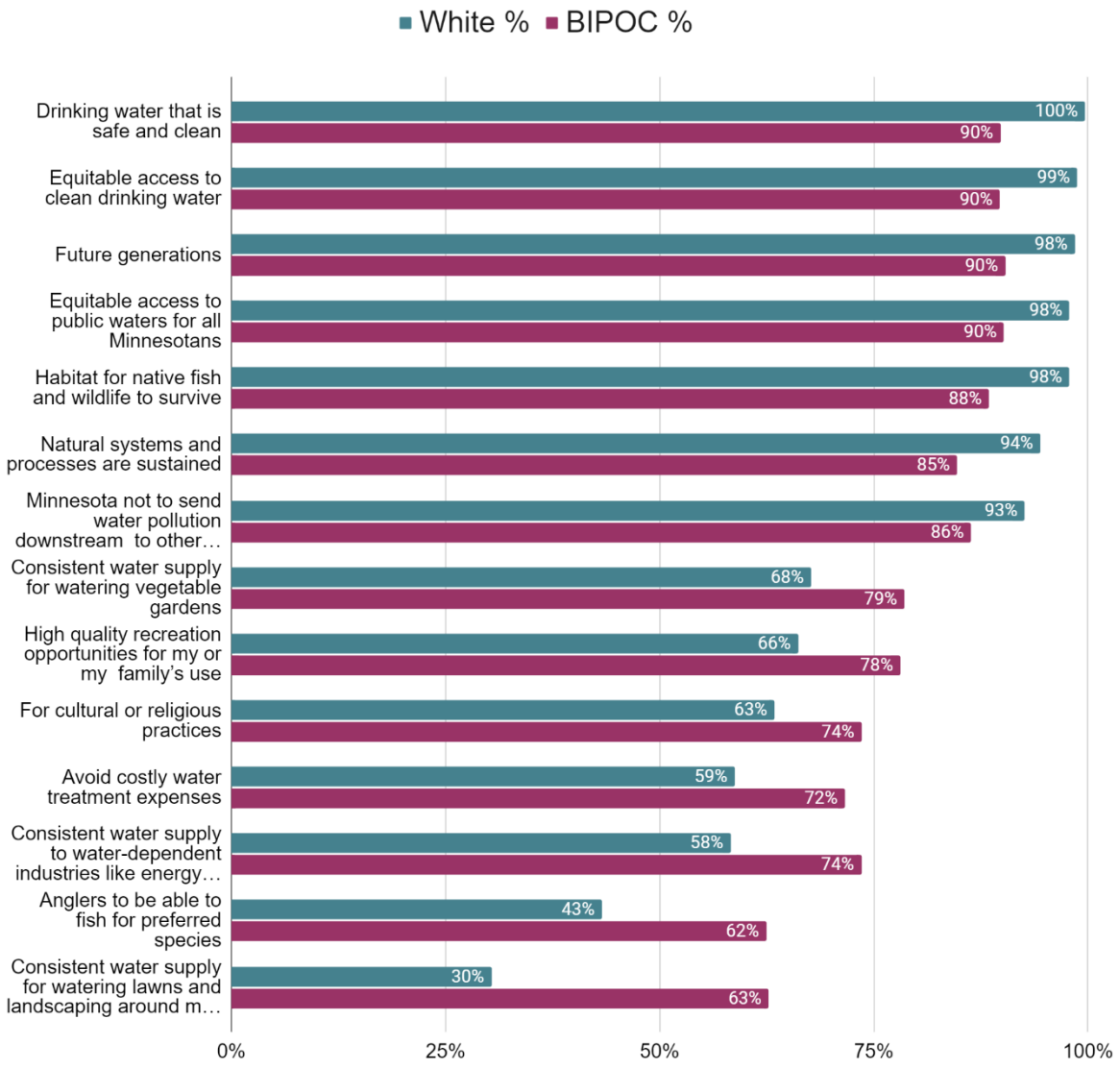

Figure 6. Percent of respondents rating the water value as very or extremely important to protect by grouped BIPOC category and White-Only category.

Respondents who identify as female placed significantly higher importance than respondents identifying as male on four water values: “habitat for native fish and wildlife to survive,” “natural systems and processes to be sustained,” “Minnesota not to send water pollution downstream to other states or nations,” and “equitable access to clean drinking water” (Appendix K, Table K16).

Water values also differed across age groups. We found that younger respondents place significantly higher importance than older respondents on three water values: “future generations,” “drinking water that is safe and clean,” and “equitable access to clean drinking water” (Appendix K, Table K14).

Water values varied by homeownership status. Homeowners place higher importance than renters on values such as “equitable access to clean drinking water,” “drinking water that is safe and clean,” “future generations,” “equitable access to public waters for all Minnesotans,” and “habitat for native fish and wildlife to survive” (Appendix K, Table K15).

Water protection actions

Lastly, participants were asked about their intention to engage in water protection actions in the next 12 months. Participants rated five actions on a five-point scale from “most certainly not,” to “most certainly will.” Actions most likely to be taken in the next 12 months on average were “take actions to support environmental justice” and “talk to others in my community about water issues or water protection activities.” These actions received an average rating of “probably will” engage (means 3.72 and 3.52). The action least likely to be taken was “volunteer for a community organization or a water protection event” receiving an “uncertain” rating overall (mean 3.16) (Appendix J, Table J13).

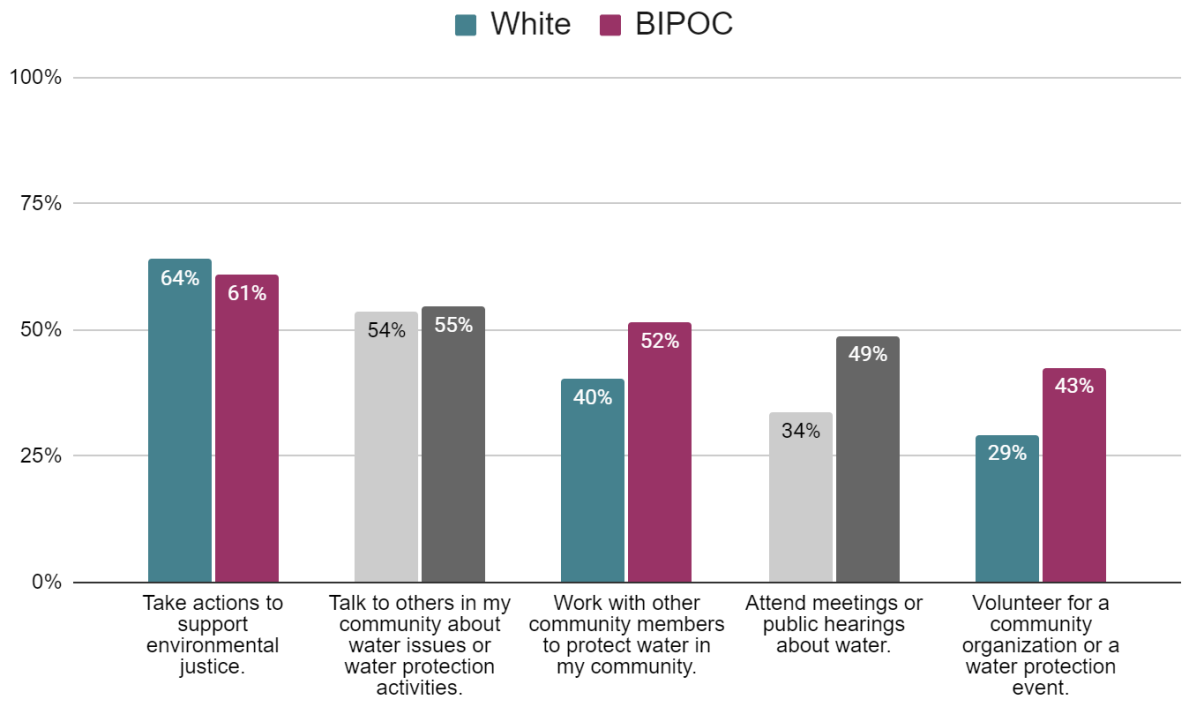

Figure 7. Percent of respondents reporting they probably will or most certainly will engage in water protection actions by White-Only and BIPOC categories. Grayed bars (i.e., “talk to others…” and “attend meetings…”) indicate mean differences were not statistically different between subgroups.

BIPOC category respondents rated themselves significantly more likely to “volunteer for a community organization or a water protection event,” “work with other community members to protect water in my community,” and “attend meetings or public hearings about water” than did White-Only category respondents (Figure 7). In addition, renters rated themselves more likely to volunteer and attend meetings or public hearings than homeowners (Figure 8). Subgroup comparisons across gender identity and age revealed no statistical differences.

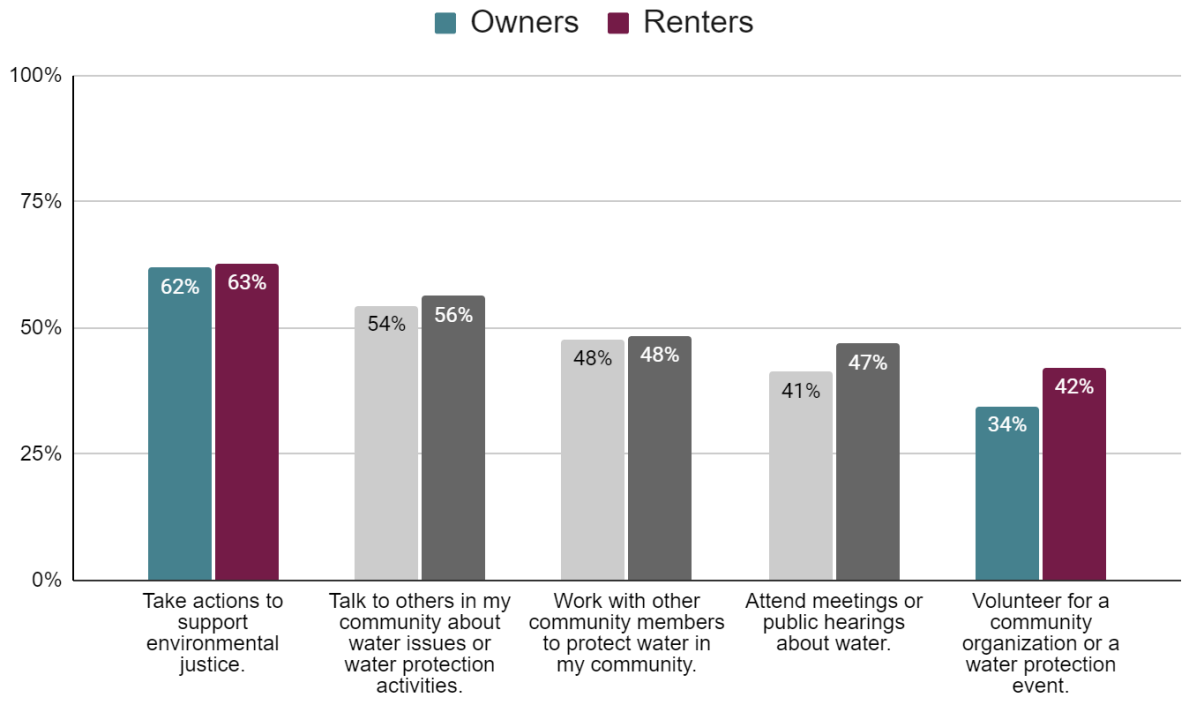

Figure 8. Percent of respondents reporting they probably will or most certainly will engage in water protection actions by homeownership and renter categories. Grayed bars (i.e., "talk to others…," "work with other community members…," and "attend meetings…") indicate mean differences were not statistically different between subgroups.

4. Lessons Learned

Research methods matter

This project was guided by the core principle of understanding and uplifting marginalized voices and communities that are often under-represented in water science, policy and management – if they are represented at all. We uncovered statistically significant differences in water relationships including values, concerns, and practices across social and cultural groups. These insights would not have been captured without an inclusive and community-centered research design. Though Phase I, a mail survey, intentionally targeted residents living in economically and racially/ethnically diverse census tracts in MSP, its sampling and data collection techniques did not represent the social and cultural diversity of residents living in those communities, or their varied water relationships. In contrast, Phase II, an onsite event survey, shows us that meeting residents in their communities, at their cultural events, and in culturally relevant ways yields a more representative sample and produces more inclusive research findings overall.

Water has a lot to teach us

Water teaches us about values. In this study, we find that MSP residents value water immensely and for many different reasons. Consistent with our previous survey research (Roth et al., 2021; Davenport et al., 2024), drinking water that is safe and clean, equitable access to water, and water for future generations are highly revered values; 9 out of 10 respondents rated these values as very or extremely important to them. These values emerge as a core water and environmental ethic in MSP and across the State of Minnesota. Adherence to these principles should guide programs, policies, and management approaches to water restoration, protection, and stewardship. We also learn that water relationships vary significantly across social and cultural groups in MSP. For example, comparisons between White and

BIPOC respondents suggest some differences in value dimensions: White residents may place higher importance on ecological dimensions of water when compared to BIPOC residents. BIPOC residents may place higher importance on protecting water for health, economics, cultural practices, and consumption (i.e., drinking water, fishing) dimensions than White residents. Importantly, this study confirms that the majority of BIPOC residents in MSP have very deep and holistic relationships with water across a wide range of water values, uses, and dimensions. Policies, programs, and capital investments, whether for housing, commerce, transportation, or food access, that center water (i.e., restoring, protecting, and celebrating water) will have support across communities.

Water teaches us about basic needs. We learn that certain water policies, programs, and capital investments work better for some groups than others. Even a water relationship and human need as basic and universal as drinking water from a household tap is not uniformly or equitably attained across MSP. Our study indicates that White residents are twice as likely to drink water from their household tap than Black or African American residents. This finding has important implications for water service professionals charged with provisioning drinking water to millions of homes across MSP: access to drinking water is an environmental justice issue in MSP. Despite water being *available* to most homes across MSP, *accessing* clean and safe drinking water is more complicated, costly, and challenging overall for Black residents, Indigenous residents, and other residents of color living in MSP than it is for White residents. Accessing clean and safe drinking water is also more worrisome for BIPOC residents than it is for White residents. BIPOC residents are less likely than White residents to like the taste of their water. Importantly, not drinking water from the tap is not simply a matter of taste or preference. We learn that BIPOC residents have significantly less trust than White residents in the safety and reliability of their drinking water. Trust in public services is critical to attaining and benefiting from those services, and in many instances having the capacity to prepare for or adapt to disruption of those services.

Water teaches us about environmental justice. The study reveals that BIPOC residents have more and higher-level concerns about environmental stressors related to water than White respondents, and in some cases by very large margins (e.g., 20 percentage points or more). Study results indicate that BIPOC residents are twice as likely to be very or extremely concerned about flooding in their community than White residents. They are more concerned than White residents about water in their basements, adequate water supply at home, sewer or septic problems, and water that is not safe for drinking. Notably, water equity was highly valued among all respondents regardless of race or ethnicity, underscoring the importance of approaching water policy, management, and associated outreach through the lens of environmental justice. In our study levels of concern about lead pipes and exposure to lead did not vary by respondents' race or ethnicity; all groups were similarly concerned. Overall, participants described themselves as only "slightly" familiar with water issues and expressed the desire to learn more. Water justice makes knowledge more accessible and requires a critical examination of the systems that support and promote disparities: physical and metaphysical.

A water crisis

Examples abound of exclusionary land uses and planning practices that continue to create racial and ethnic disparities in wealth, employment, housing, access to nature, and the burdens of environmental stressors like industrial pollution and climate change (Walker, 2023). The tragedies in Flint, Michigan, Jackson, Mississippi, and other cities underscore the dire consequences of failing to provide communities with safe drinking water and wastewater treatment services and highlight the insidiousness of systemic racism and water injustices (Campbell et al., 2016; Hanna-Attisha et al., 2016). In the case of MSP, this survey research suggests that life experiences of environmental racism and burdens, pervasive distrust in government, and limited capacities to resist or adapt to environmental stressors (e.g., treat or filter water, have tap water tested, track down information) may have cumulative and interacting outcomes for access to residential drinking water, and for broader community health and wellness. This study reveals critical next questions for scientists and policymakers: Are BIPOC residents

meeting their water intake needs? What might they be substituting for water? What are the health effects of dehydration and the consumption of other beverages in place of water (e.g., soda, caffeinated drinks)? What are the ecological effects of commercial plastic water containers and waste? What are the economic effects of purchasing water rather than drinking water already supplied at the tap? What are the effects on residents' relationships with water and implications for relationships to the natural environment more generally? What are the effects on mental health and wellness? Are residents similarly not trusting water for swimming or fishing/eating fish? Do residents similarly worry about air quality, food security, and access to nature? Water service providers might ask, how does distrust erode support for water services? How does distrust change perceptions of the value of water services and the value of the natural environment in development decisions? How can professionals work hand in hand within their communities to build trust in and support for water services in a meaningful way?

The answers to many of these questions have already been answered by community leaders, advocates, and community-based organizations that understand more deeply than any scientist or research study can offer how their own communities are impacted by environmental and water injustices. This study provides a small window into a water crisis that has received far less attention by the media and remains largely unaddressed in water policy, science, and management. Solving the crisis is not about helping communities understand water. Solving the crisis is about helping water professionals understand communities and how to serve communities in ways that are relevant to their water relationships, including values, concerns, and practices.

This study's findings also point to generational differences in drinking water access. Younger residents are more likely to drink water from the tap than older residents. Though these findings may indicate increased health concerns for older MSP residents who rely on bottled water brought into the home to maintain hydration, the findings may also point to new generations of residents who are familiar and comfortable with drinking water from the household tap, and who are more adept at seeking out water information.

Water policy for all

This study further underscores the notion that simply providing services, building infrastructure, and distributing resources (e.g., parks, trails, fishing piers, boat launches, water supply lines), does not ensure fair and equitable access to, use of, and benefits from those services. For people, groups, and communities that are racially segregated and minoritized, economically marginalized, and not represented in positions of power, environmental injustices are not only distributive, but also representational, procedural, and relational. Policies, programs, and capital investments that improve water infrastructure and only address how clean water is distributed may not benefit all residents. Similarly, government-led programs that distribute "educational" materials to residents on the safety of their drinking water may not be culturally relevant or address the core relationships residents have with water (Pradhananga et al. 2019). A focus on policy *outcomes* rather than *policy-making processes* is a persistent problem in government-led environmental justice work (Pearsall & Pierce 2017).

Representation, procedural, relational (also called interactional), and restorative (also called reparative) justice (Calderón-Argelich, 2021) can be addressed when water science, management, and policy are guided by intentional community engagement and collaboration across social and cultural differences. Trusting relationships, mutual learning, co-production of knowledge cannot be engineered. These processes are more metaphysical than physical. There is no physical environmental measurement to be made that can address these challenges. An econometric equation for the return on investment for relationship-building does not exist. It's relational, it's communicative, it's dynamic, it's emotional. Perhaps most importantly, it must be community-guided (see Pradhananga et al., 2019). Our study indicates that significant disparities in trust exist across race, ethnicity, and homeownership. White residents and homeowners are significantly more trusting of government (non-tribal) as sources of water

information than other racial/ethnic or renter groups. Study findings further show that Black or African American and American Indian or Alaska Native residents are significantly less trusting than other cultural groups of local, county, state, and federal governments as sources of water information. Environmentally just water policy prioritizes representation, process, and relationships as these values are essential for sustainable water outcomes that benefit current and future generations. Just water policy critically examines questions such as, whose values, concerns, and practices drive water decision making? How do we create water policies and systems that meet the needs of all current and future generations of Minnesotans? How do we begin on the path together toward water justice so that all Minnesotans can “reasonably expect that the diversity of water relationships and values of community members are fairly deliberated and equitably represented among those in power” (Davenport et al., 2023, p. 289)? Finally, this study confirms that BIPOC identifying community members are prepared to engage in volunteering, working with community members, and attending meetings to protect water; these events should be co-designed with cultural knowledge holders and community leaders to uplift and celebrate cultural connections to water (Pradhananga et al., 2019).

WATER POLICY CO-DEVELOPMENT WORKSHOPS

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1. Introduction

The research team designed and hosted three policy co-development workshops aimed to engage water professionals and community leaders from across the MSP in relationship building and policy discussions. The objectives of the workshops were to 1) present preliminary onsite survey findings and facilitate discussion around the findings, 2) co-develop policy ideas for equitable water stewardship in the Twin Cities metropolitan area, 3) prioritize policy actions based on the experiences and perspectives of community leaders and water management professionals, and 4) create action steps and implementation strategies around select policies. PIs Roth and Davenport facilitated the workshops and 3-4 UMN research assistants provided support and notetaking throughout the sessions.

2. Methods

The policy co-development workshops format and process was adapted from Perry (2017) and the chapter titled “Better Together: An Action Matrix Approach to Community-Based Environmental Decision Making”). The action matrix process “provides a structure for community members to discuss and prioritize local actions to support community-based implementation. (Perry, page 99)” The process validates community values, experiences, and preferences and integrates these perspectives into policy development. Participants share knowledge, experiences and stories of community and water; and in that process they are asked to brainstorm policy ideas and then prioritize those ideas through deliberative dialogue. As Perry describes, the action matrix process produces policy outcomes (the policy actions and priorities) and relational outcomes (mutual learning, relationship building, and shared goals within communities).

Participants

We invited water resource professionals (e.g., local government staff, environmental engineers) and community leaders (e.g., representatives from local community organizations such as non-profits, neighborhood associations, cultural groups, citizen commissions) to participate with the goal of inclusivity and representation of diverse water values, relationships, and ideas on equitable water policy. A prospective participant list was developed that included both water managers and community leaders through relationships developed from the onsite survey efforts and recommendations from project partners. Invitations were sent to 61 different water professionals and community leaders across 47 different organizations. In total, 27 individuals participated in the three workshops. Organizations represented in workshops included:

- Bassett Creek Watershed District
- BF50 Indigenous Health Initiative
- Capitol Region Watershed District
- City of Edina
- Emmens & Olivier Resources (EOR) Inc
- Feeding Frogtown
- Folwell Neighborhood Association
- Greater East Side Community Council
- Hennepin County
- Hmong American Farmers Association
- McKinley Neighborhood Association
- Metro Blooms
- Metropolitan Council
- City of Minneapolis
- Minnehaha Creek Watershed District
- Minnesota Department of Natural Resources
- Minnesota Humanities Center “We Are Water”
- Minnesota Pollution Control Agency
- Mississippi Watershed Management Organization
- Northside Greenzone Task Force
- Ramsey Washington Metro Watershed District
- Southside Greenzone Council
- Westside Community Organization

Workshop Format

We organized three separate workshops, each lasting 2 hours. For workshops 1 (n=10) and 2 (n=7), the format and structure were the same, but the audience for each differed. Workshop one included participants in the "water management professional" category while workshop two included "community leader" participants. We intentionally kept the two groups separate so that participants' ideas and perspectives were not influenced by others who worked in different sectors, allowing for more open conversation. Workshop 3 brought both groups together (n=19). Community leader participants were offered $100 as an incentive for their participation in each workshop ($200 in total). Participants received their incentives when they signed in for the workshop. During the sign-in process, participants were also asked to register their consent to be photographed. Workshops were not audio recorded, but instead research assistants recorded notes on the conversations while keeping names and organizations anonymous from any quotations or ideas recorded.

Workshops 1 and 2

Workshops 1 (April 26) and 2 (May 6) were held at the Mississippi Watershed Management Organization (MWMO) office in Northeast Minneapolis. The format consisted of three main parts: a presentation of preliminary findings from the onsite survey efforts, a facilitated discussion on reflections, and a small-group activity focused on the development of equitable water policy ideas (see Agenda, Appendix N). First, facilitators presented preliminary findings from Phase 2 of the project: the onsite survey at community events. Findings shared examined,

- Water values
- Drinking water sources and perspectives
- Trust in water information sources
- Water concerns, and
- Water protection action intentions

Findings presented included data tables, charts, and select comparisons across respondent subgroups (i.e., racial and ethnic identity and homeowner/renter)

After reviewing survey findings, facilitators guided participants through an "ORCA" (adapted by Davenport from ORID method, Stanfield 2008) discussion process with prompts around participant:

O: observation
R: reflection
C: contemplation
A: action

Participants made observations and reflections about the onsite survey findings presented while facilitators took notes. Then in small groups, participants continued their discussions, contemplating how these findings fit into their experiences of water and community. Finally, the "action" component of the discussion led participants into the final stage of the workshop - the development of equitable water policy ideas and actions.

Following a worksheet (Appendix O), participants worked in small groups to co-develop policy ideas for water equity based on what they learned from the presentation and their own experiences and perspectives. Participants shared policy ideas to the full group at the end of the workshop while facilitators documented the ideas and themes.

Following workshops 1 and 2, the research team gathered all the policy idea notes and worksheets, and through a debriefing process developed more direct policy statements, or "policy actions". The research

team worked together to sort, combine ideas, and add context, while ensuring the ideas stayed true to the original intent of the participants that co-developed them. Twelve policy actions were developed based on this data.

Workshop 3

Workshop 3 (May 13) was held at the Rondo Library in Saint Paul. For workshop 3, all participants from the first two workshops were invited back into one combined group, as well as a few participants who were unable to attend the first two workshops but requested to be included in workshop 3. The focus of the third workshop was to review onsite survey findings presented in the first two workshops, share back the policy actions that were co-developed, and develop priorities and action steps through a hands-on, interactive activity (see Agenda, Appendix P).

First, facilitators reviewed elements of workshops 1 and 2 to bring everyone to a basic understanding of the process overall. Then facilitators presented the policy actions that had been developed in the first two workshops. The twelve policy actions were explained so that everyone had a common starting point and grounding for the activity. Next, each individual was given a set of cards: one card for each of the twelve policy actions. Individuals then prioritized the twelve actions from 1 (highest priority) to 12 (lowest priority) and noted the number on each card.

Following the individual prioritization, participants were organized into 5 small groups consisting of a mix of water professionals and community leaders in each group. The purpose of mixing groups was to bring a diversity of perspectives and experiences to the discussion. The groups then were given another set of policy action cards that were used to plot onto an action matrix. The matrix had “difficulty” along the x axis (from low to high) and “impact” along the y axis (from low to high). The group discussed their individual priority ranks and the merits of each policy action and then came to a consensus on where each action would plot on the matrix of difficulty versus impact.

Next, each small group shared out to the larger group what their “top actions” were and where they were mapped on the matrix. The definition of “top action” was purposefully left vague so that groups could determine what was a priority collectively, whether that be one of very low difficulty, one of the highest impact, or somewhere in between. The top actions from each group were plotted on a matrix for all participants to see. Groups could then observe and reflect on different interpretations and placement of actions. Each small group then selected one policy action that they would explore more deeply for action planning. In total, four different policy actions were chosen among the 5 small groups for the action step and implementation planning process.

Groups were provided with an action planning worksheet to help guide them through action step planning for the policy action (Appendix Q). For each policy action, groups were encouraged to think about:

- Practices/behaviors needed to achieve the policy goal
- Specific action steps to achieve the policy goals
- Policy actors to be involved - and their roles/responsibilities
- When and where the policy will impact
- Resources needed
- Barriers or uncertainties related to success
- Plans for learning and adapting

Small groups shared out the action steps related to their chosen policy action to the full group while facilitators noted opportunities and barriers on flipchart paper displayed for all to see. Prior to ending the workshop, facilitators opened the floor to participants to share ideas for next steps for the work.

3. Co-Developed Policy Actions

Following the first two workshops, participants' water equity policy ideas developed into twelve standalone policy action statements.

1. **Promote understanding of the cultural values and benefits** clean water provides by prioritizing public access and recognizing the diverse ways people value and experience water.

2. **Provide equitable and transparent public access to water knowledge** including multi-language and accessibility-appropriate water quality reporting, social media communications, free water testing, and opportunities for community-based clean water stewardship.

3. **Provide equitable and transparent access to water knowledge for renters**, including quality, management, resources, and services through accessible web pages with transparent water quality data, free water testing resources, and funding for water infrastructure improvements.

4. **Authentically engage with BIPOC communities** through regular and clear communication, community liaisons, iterative trust- and relationship-building, limiting turnover of community engagement staff, and including community *in* the community-building process at multiple steps.

5. **Plan and support community-led spaces** where transparent information sharing and meaningful decision-making can occur by offering non-intrusive incentives like child care, utility bill discounts, and interpreter services in multiple languages.

6. **Create and implement Diversity, Equity, Inclusion, & Justice (DEIJ) trainings** in the water workforce to address past harms, implicit biases, and barriers to authentic community engagement, including training by local community experts about the communities the workforce will be serving.

7. **Support workforce development** that represents the communities and demographics they serve by including wrap-around services such as transportation, increased training for young people, hiring from within the community, and funding training for project maintenance.

8. **Improve inter-agency collaboration** to support more equitable planning by open data sharing of water issues, community vulnerabilities, recreation and open-space access, and infrastructure investment planning among agencies.

9. **Design flood management plans for equitable recovery** from flooding in the short-term, mid-term, and long-term by instilling proactive and equitable planning procedures.

10. **Design and frame water supply management within the context of climate change** for future generations using future precipitation and temperature estimates and models.

11. **Integrate long term funds that support equitable watershed management** by crediting MS4s for best management practices to incentivize upstream practices.

12. **Integrate an environmental justice framework into wastewater infrastructure investments** plans and dedicate a percentage of a utility's work budget to equity-related projects.

4. Prioritization and Action Planning Outcomes

Prioritization

Each participant in workshop 3 ranked the 12 policy actions from 1 (top priority) to 12 (lowest priority). The rankings were aggregated and analyzed to assess the mean rank of each policy action (Figure 9). Policy action #4/D: “authentically engage with BIPOC communities” was the top priority with a mean ranking of 2.36. The lowest priority (mean = 8.79) was policy action #10/J: “design and frame water supply management within the context of climate change.”

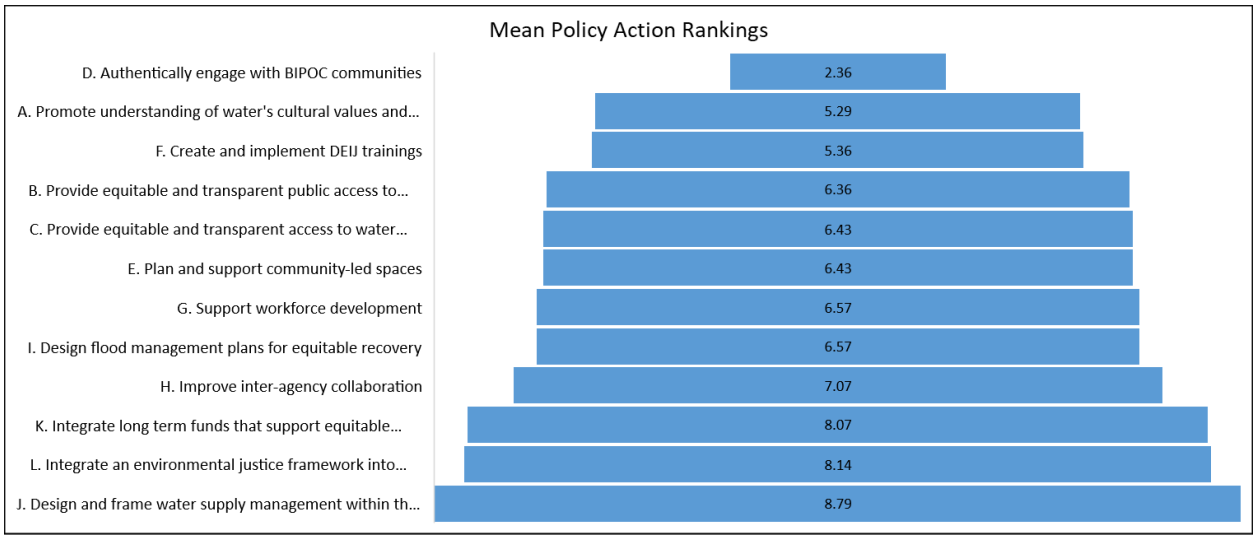

Figure 9. Mean ranking of policy actions in workshop

Small Group Mapping

Small groups then mapped the policy actions on a matrix (difficulty vs. impact) through discussions sharing their individual prioritization ranks, knowledge, and experiences with water and community. Each matrix map was unique (see Figures 10-14 below). Groups had varying perspectives on the degree of difficulty and impact of each policy action, which led to matrices of different configurations.

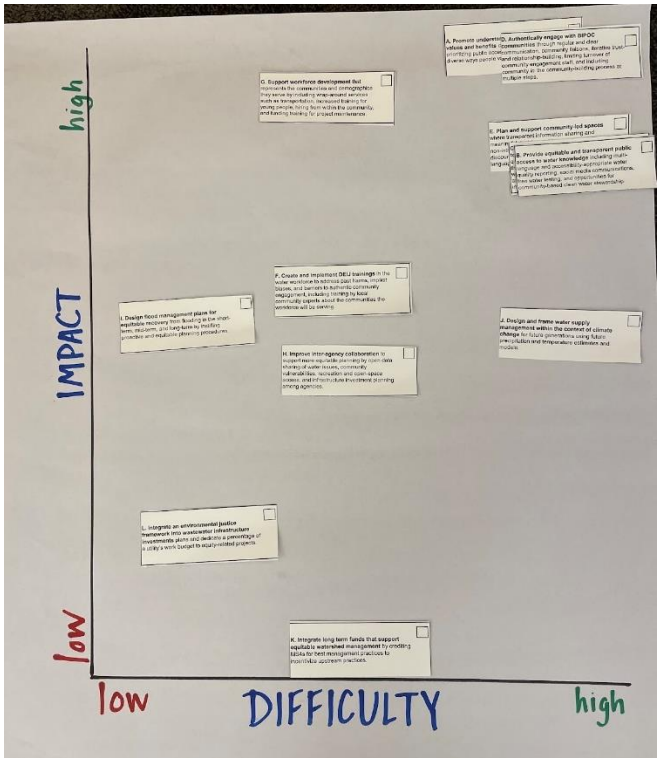

Figure 10. Small group mapping #1

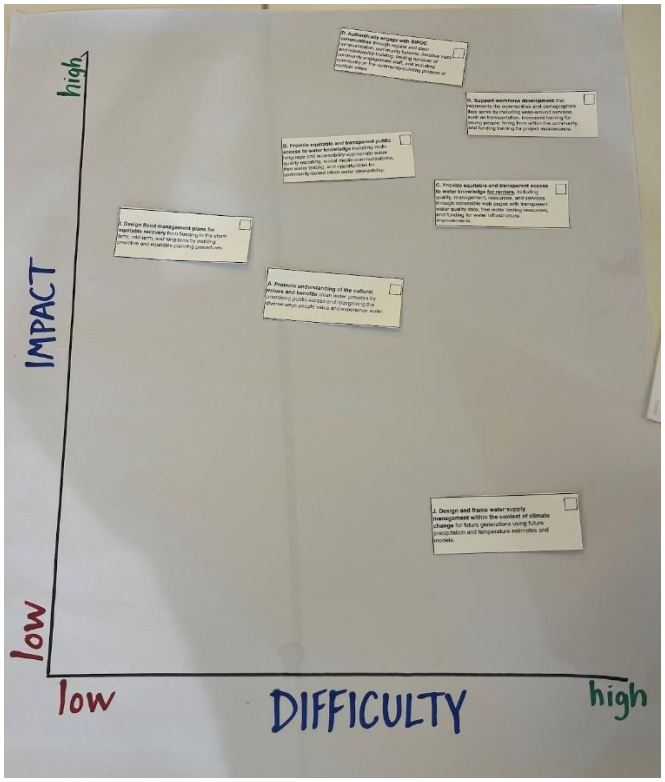

Figure 11. Small group mapping #2

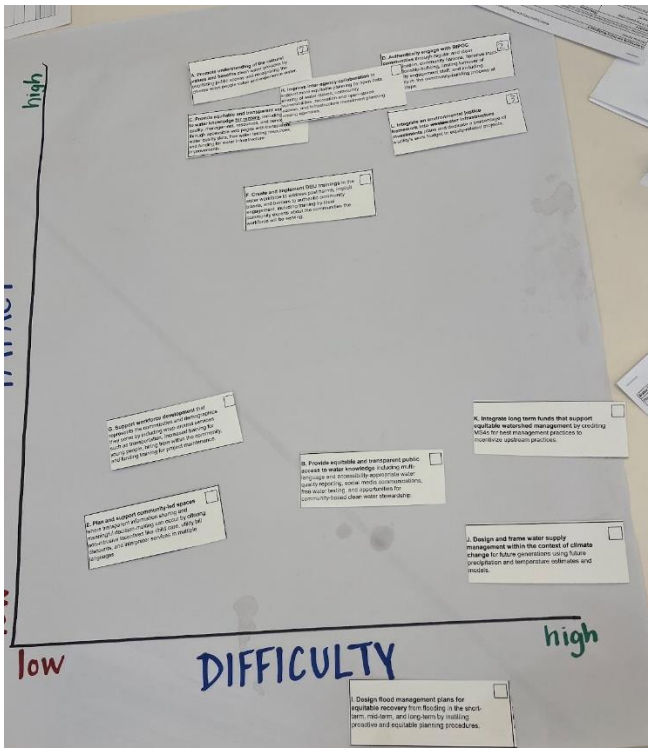

Figure 12. Small group mapping #3

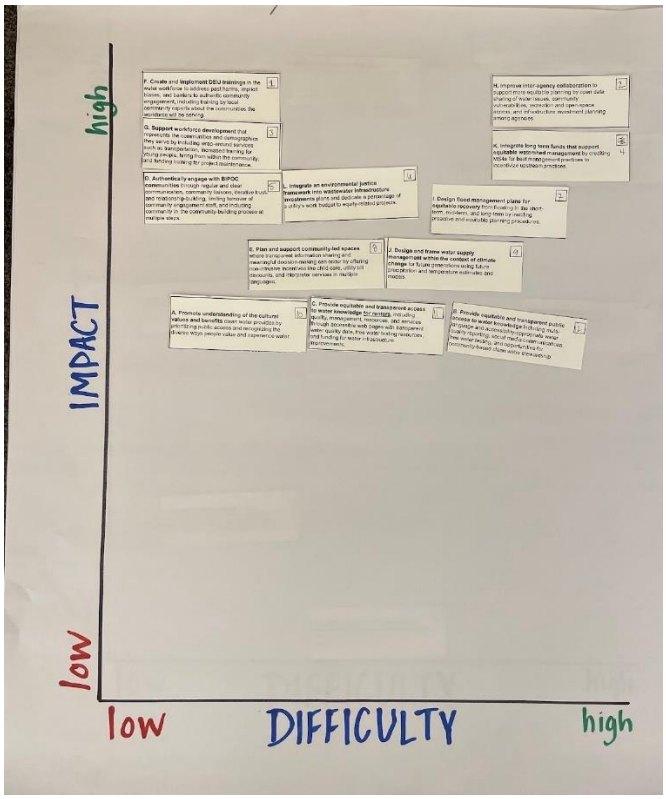

Figure 13. Small group mapping #4

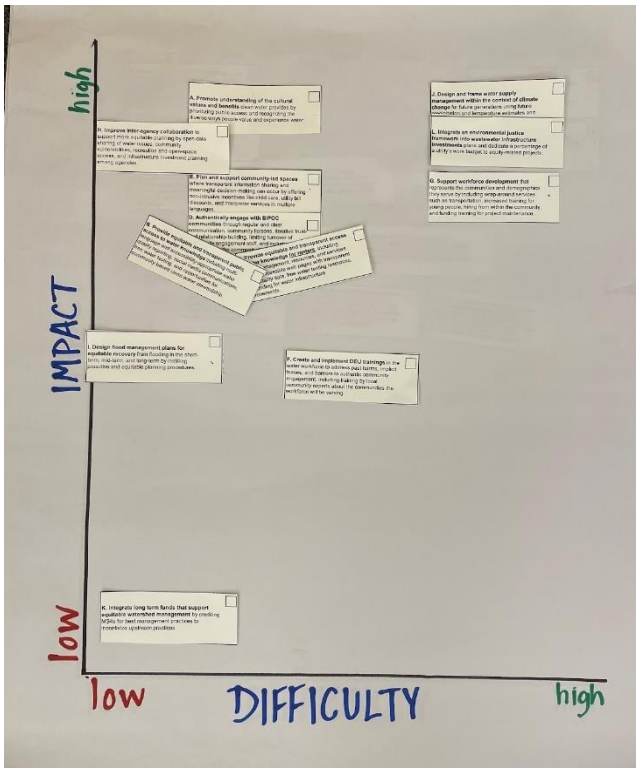

Figure 14. Small group mapping #5

A combined plot demonstrates the different placements by each group (Figure 15).

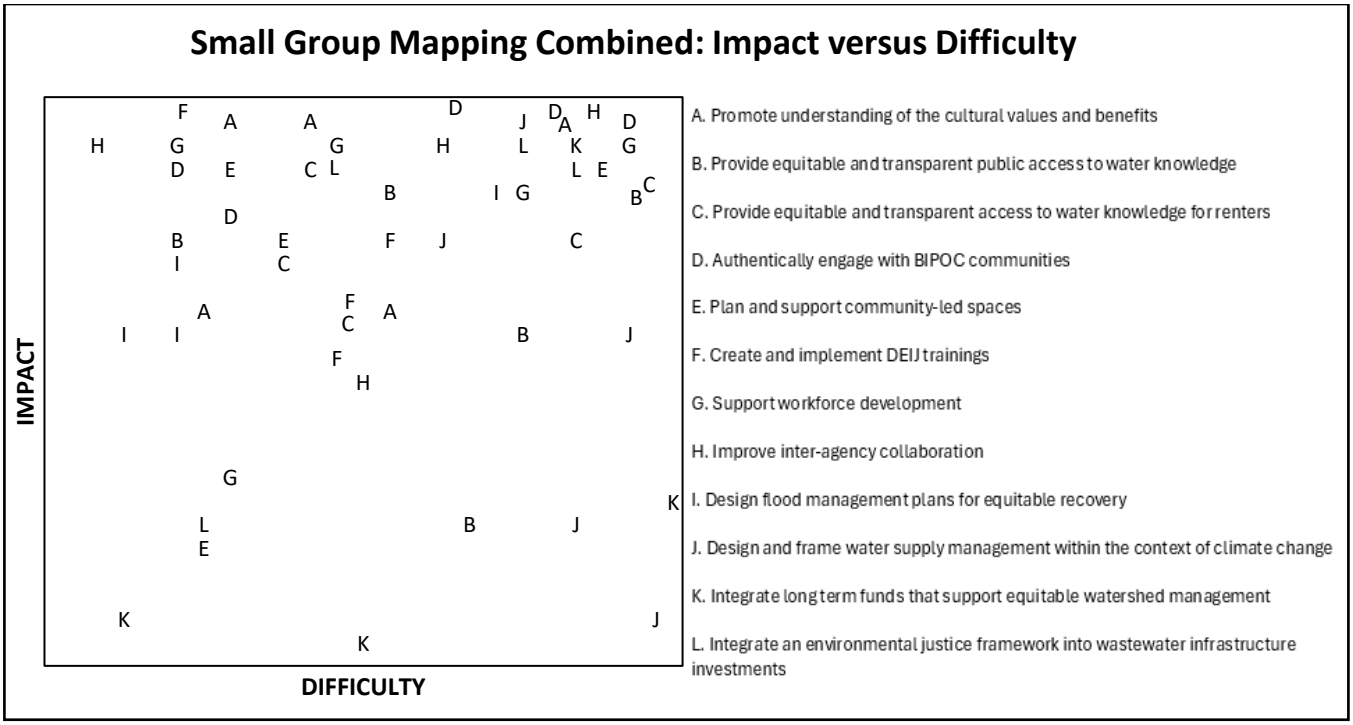

Figure 15. Combined small group mapping of policy actions

Small Group Action Planning

Small groups then each selected a policy action to further develop into action steps. The following section details action steps and implementation ideas for 4 policy actions:

D. Authentically engage with BIPOC communities

E. Plan and support community-led spaces

F. Create and implement DEIJ trainings

G. Support workforce development

Small Group Action Planning Outcomes for "Authentically Engage with BIPOC Communities"

Goal and Behaviors

The primary goal of this policy action is to authentically engage with BIPOC communities by fostering trust and creating feedback loops of information sharing with communities around projects that are happening within a community. To achieve this goal, new behaviors needed will include clear lines of communication, the centering of community, and transparency with what stage in the process a project is at.

Implementation Plan

All groups related to a project should be involved (e.g. government, communities, non-governmental organizations (NGOs), businesses, etc.). The government needs to put the community first and funnel money into the community for the project. A community board should be created that will allow communities to provide information to the government related to the project. To implement this type of policy action, both financial and time resources will be required. It will take time to build trust, to set up community boards, to have deliberate and open communication prior to project implementation - and community members will need to be compensated for their time participating in this engagement. Finding the community members willing to engage - even with compensation - can be a barrier to this policy action. Additionally, community members may believe there are more pressing issues in their community rather than water resources. Turnover of community engagement staff can also be a barrier to success because relationships will need to be built over again.

Keys to Action

1. At each gathering, (re)evaluate who is in the room and who is not. Who is missing from the table? Why (or why not) should they be included?
2. Find ways to connect to the people who are not at the table and make the efforts needed to connect.
3. At gatherings, create an environment of community networking.
4. Communicate back results during and after projects.
5. Create a community board as a liaison to government entities for future projects.

Small Group Action Planning Outcomes for "Plan and Support Community-Led Spaces"

Goal and Behaviors

The primary goal of this policy action is to meet people where they are to effectively engage. The goal is to provide the *community* - rather than the agency experts - the chance to set an agenda, share and respect information, and prepare actions and priorities around water in a no/low-barrier setting.

Keys to Action

1. Identify community champions (e.g. conveners and information transmitters)
2. Set up a time and place with a comfortable space
3. Define supports/resources needed (e.g. childcare, transportation, compensation, technical assistance)
4. The “champions”, or a community board, formulate agenda

Small Group Action Planning Outcomes for “Create and Implement DEIJ Trainings”

Goal and Behaviors

The primary goal of this policy action is to create and implement DEIJ training between communities, government agencies, and organizations.

Implementation Plan

A variety of groups should be involved in this policy implementation including NGOs, government agencies, businesses, schools, and community centers. To implement this, financial resources will be needed to host events/trainings and engagement - and physical spaces will be required for the actual trainings/learning opportunities. Finding the funding for these trainings could be a barrier to success. Additionally, employee turnover creates an uncertainty in staying consistent and comprehensive with training. The mindset of the organization and staff who are participating in the training could also be a barrier. Staff and organizations need to come in with an open and inclusive mindset, rather than a mindset of maintaining control.

Keys to Action

1. Engage with culturally owned businesses and organizations within the communities
2. Use concise contracts with active roles so that everyone has a specific duty/purpose
3. Create a community-led decision-making process with full access to participation
4. Ensure everyone is at the table during the decision-making process
5. Ensure all deals are in writing and notification must be done in a timely manner (2+ weeks)
6. Authentic in-person engagement at the initial point of contract must be done to create good connections
7. The trainings must have a positive impact on the community it is serving

Small Group Action Planning Outcomes for “Support Workforce Development”

Goal and Behaviors

The primary goal of this policy action is to have a water workforce that is representative of the community it serves. To achieve this goal, there needs to be an increased awareness and interest in various water industry jobs (e.g. drinking water utilities, watershed districts, state agencies) and an education plan for young people.

Implementation Plan

To implement this policy action, water organizations (e.g. cities, utilities, watershed districts), school districts, and other youth/community organizations will need to be involved. Financial resources will be important to ensure internships and training come with good pay - and are in accessible locations. Additionally, additional educational resources will need to be developed. Staff capacity at many water utilities and agencies is limited - as is school teachers - so they will need budgeted positions in order to perform the necessary outreach. Once young professionals are hired and onboarded, there will need to be inclusive spaces and resources so that they stay and grow in their organization.

Keys to Action

1. Provide curriculum and activities to ongoing classes, clubs, and groups because teachers/leaders do not have time or capacity to develop their own.
2. Integrate required water curriculum into elementary schools so that youth learn about the water sector in age-appropriate ways.
3. Leverage existing youth organizations (e.g. 4H) to learn about and promote the water industry.
4. Expose students in middle school and high school to water sector careers including job/career fairs and visits/tours to water organizations.
    a. Job/career fairs should be *at* the school, so they are accessible
5. Educate guidance counselors on the different career paths (with and without college education) in the water workforce.
6. Create (well) paid internships and training programs (e.g. fellowships) that incentivize these career types and give youth experiences in the field.
    a. Internships needs to be at accessible locations and/or provide transportation
7. Hire entry positions at higher rates/salaries if they have the internship/training experiences

Policy Co-Development Workshop Key Themes

The research team identified several key policy action themes emerging from the workshops related to the policy ideas directly, actions needed for implementation, and implications for water equity.

Policy Actions Reflections

Table 4 provides highlights from the discussions on the policy action ideas.

Table 4. Policy Action Themes

Policy Action	Discussion Reflections
A. Promote understanding of cultural values and benefits of water	• The action is more difficult in practice than in theory. • Need to understand the cultural practices to understand the value and benefits they hold. • Interconnected with F and L. • Critical to understand culture and community to build trust. • Goes hand-in-hand with D: “have to actually engage to learn cultural values”
B. Provide equitable and transparent public access to water knowledge	• Communities need knowledge first to know water is safe. How will trust be built? • Should be combined with C:“Separating renters is alienating.” • Difficult due to lack of community engagement and community liaison staff in water agencies • Would be more impactful if engagement / knowledge access comes *to* the resident
C. Provide equitable and transparent access to water knowledge for renters	• Hard to engage renters with high turnover rates due to the repeated interactions and messages necessary • Need to consider language and ability barriers

D. Authentically engage with BIPOC communities	• "The big one" • High impact but high difficulty: "if it was easy, we wouldn't have water problems" • Community engagement needs to be the core of the policies but getting everyone on the same page is hard • "Giving people a voice is the most important thing"
E. Plan and support community-led spaces	• Requires community buy-in to be successful
F. Create and implement DEIJ trainings	• A low hanging fruit policy because it is high impact and low difficulty ○ High impact, but more internal/institutional • Requires hiring someone who know what they're doing • Need to ensure residents know about these efforts • Distrust of regulatory/management policies can be a barrier • Need to be clear on how this actually addresses equity and how to enforce it • Interconnected with A and L • Should be a bridge between F and H
G. Support workforce development	• Requirements for jobs need to be lowered because BIPOC youth have fewer training opportunities • Need to start with educating youth: "help me understand how water can help me" • Has more tangible outcomes than other policy actions
H. Improve inter-agency collaboration	• Should be a bridge between F and H • Difficult to create open communication lines across agencies but very critical
I. Design flood management plans for equitable recovery	• Lower priority among community leaders because they lack the "knowledge to know if it's important or not" • Is easy to set aside money for partnering with communities
J. Design and frame water supply management within the context of climate change	• Requires community buy-in to be successful
K. Integrate long term funds that support equitable watershed management	• Lower impact overall but could be high impact for farmers (including immigrant and emerging farmers)
L. Integrate an environmental justice framework into wastewater infrastructure investments	• Participant support for eliminating "waste" in wastewater to provide a more holistic view • High priority for participants if "waste" is eliminated • Interconnected with A and F

Policy Actions, Implementation, and Planning Themes

Six key themes that emerged around the policy ideas, implementation and planning discussions:

- Policies are interconnected
- Judgements of policy “difficulty” varied between water professionals and community leaders
- Good intentions matter but are not enough
- Policy development should center communities affected
- Treat water holistically, as part of cultural systems
- Protecting water means protecting communities

Policies are interconnected

Participants shared that they felt many of the policy ideas are tied together and can be difficult to prioritize one over the other. Others felt the policy ideas might even be sequential and would necessitate consideration of the order of operations rather than tackling them in order of “priority”.

Judgements of policy difficulty varied

When comparing priority lists and discussing placement of policy ideas on the impact versus difficulty matrix, many water managers described actions as being high difficulty and engaging the communities is “hard all around”. However, often community leaders would share that engaging BIPOC communities is the easy part for them. They have well-established relationships and ongoing engagement structures within communities. As one participant shared, “when BIPOC people are centered, (engagement) is not difficult.”

Good Intentions matter but are not enough

Many discussions focused on the importance of intentions and purpose when engaging BIPOC communities. Engagement should have a purpose that will be acted upon - residents were tired of “being used as a check box” and feeling like water agencies do not actually want to follow through with holding inclusive meetings or the actions that are recommended during meetings. Some participants described feeling like decisions are being planned on their behalf without actually asking for their input or perspectives. Or that water managers are coming into communities with an agenda - or even decisions that are already made - rather than entering to seek understanding, goals, and priorities from the communities’ perspective. Similarly, there were feelings of not following-up with BIPOC communities when their input *is* asked - just extracting information and leaving.

Importantly, though, good intentions are not enough. “Intent does not equal impact” was a phrase echoed several times during the workshops. Appropriate compensation for knowledge keepers to come into conversations is one simple way to demonstrate gratitude for their contributions. And this payment should be simple - it should not require providing personal information in exchange for payment because not everyone is comfortable with that. Additionally, it could put anyone who may be undocumented in harm's way by asking for personal details in exchange for payment. Notably, payment is not the *only* necessary step. Participants encouraged water managers to work on truly understanding the communities they are serving first - rather than try to “buy trust”. Water managers should consider how funding can come into communities beyond the actual project, what the impact of projects may be, and how to prioritize community goals during a project. Additionally, community leaders encouraged water managers to create opportunities to celebrate successes and funding that is coming into communities to bring projects full circle.

Policy development should center communities

Participants - especially community leaders - focused on the need to *center communities* in water work, especially communities affected by decisions. Water managers should be regularly asking questions including:

- What community leaders should be involved in these conversations?
- Who is missing from this conversation?
- Where should these conversations take place?
- What can we (water managers) provide to your community?
- What does your community need?
- How will this impact your community?
- What is needed to build trust in this relationship/process?

Approaching water issues with the community centered first and foremost will help foster trust, gain community buy-in to projects, promote inclusivity, and demonstrate a commitment to correcting past harms. Additionally, it is important to be clear about responsibilities. Whose responsibility will it be to take the next steps and continue this work? Who is responsible for making sure these policies are implemented? Water managers should be transparent about these roles and responsibilities.

Treat water holistically, as part of cultural systems

Though water professionals tend to focus on the separate physical or biological elements of water (e.g., groundwater, drinking water, surface water, water quantity, water quality), residents do not think about or relate to water in those disconnected ways. Water is cultural. When communicating with communities about water policies, programs, or practices, water professionals need support to relate to community members' and their everyday experiences of water, whether it's about access to drinking water, effects on fishing opportunities, intersections with housing and rental property management, or water for gardens and landscaping. Listening to and uplifting these water values and experiences through community conversations will help water managers understand the diversity of ways communities connect to water in the natural environment, water services and service providers, and to each other.

Protecting water means protecting communities

One theme that emerged related to the development and consideration of equitable water policies. Some participants voiced that *all* the policies should be about protecting human communities at their core. Fundamentally, if water is protected for diverse human values and uses (e.g., gardening, fishing, swimming, drinking), it also will be protected for other beings and ecosystems. In other words, human health, well-being and equity are perhaps the best indicators of healthy water systems. Protecting water starts with protecting communities and their diverse relationships with water. Achieving water justice means securing basic needs for marginalized communities like food, housing, and employment. Water stewardship, guided by community leaders, can address each of these needs. One participant shared that it is hard to think about inclusivity and environmental justice when they are focused on securing the most basic needs for their family, such as food and housing. In many participants' minds, all policies should focus on protecting, connecting, and supporting communities at the most basic level to achieve equity and inclusion.

On the topic of community protection, one participant shared a reluctance to prioritize policies or action steps directly because they have not had the chance to take these conversations back to their community. Without having had that opportunity, they were uncomfortable providing detailed feedback or including their name or organization without more dialogue. To avoid repeating past harms and to build a foundation for trust, this participant recommended bringing the entire policy co-development process back to their community for further engagement beyond a couple of workshops with one representative.

5. Recommendations

Workshop participants were clear in their priorities for equitable water policy and management in MSP. First and foremost, water policy and management must authentically engage with BIPOC communities. This policy was described as "the big one" by a participant. The groups felt overall that the policy idea

has high impact but also high difficulty. A participant acknowledged, “if it was easy, we wouldn’t have water problems.” Despite the challenge of engaging communities in water policy and management, participants agreed that it is a core and critical need. As one participant shared, “giving people a voice is the most important thing.” It is important to acknowledge that to many of the water professionals, meaningful community engagement was characterized as a very difficult and daunting task. To the community leaders, water management seems difficult and daunting, but community engagement is much less complicated. One community leader encouraged water professionals to work hand in hand with community leaders on community engagement and then exclaimed, “it’s what we do!” While this conversation points to a disconnect or gap in perceptions, it also underscores the untapped potential of water professionals and community leaders working in collaboration. Combining the knowledge, talents, and networks of these groups would be a strong foundation for equitable water policy and management that center communities.

Processes that acknowledge, value and support different ways of knowing and relating to water are critical to respectful, responsible, and reciprocal community engagement and policy development. The community leaders participating in the workshops have experience and expertise navigating multiple values, relationships, ways of knowing, and cultural perspectives. The water professionals have experience and expertise in water’s physical and biological conditions, existing water infrastructure, and legal/policy implications of decisions. Together and in a context that levels the policy and management “playing field” (e.g., in community spaces around community values) these groups have the potential to exchange knowledge, build relationships, deliberate and prioritize options, and co-develop policy that supports community well-being and protects water.

The policy co-development workshops aimed to create those meaningful processes. However, they were only a starting point. One participant appreciated having the onsite survey data to understand more broadly how water relationships and water values vary across MSP communities: “the survey did a good job of starting to understand [communities], but now you [water management professionals] need to go into communities to get deeper.”

> *“I was truly inspired by the conversation with water regulators and community members around equitable water policy. The workshops were powerful, rewarding, and above all, respectful. I was honored to have been able to participate in those conversations.”*
> – Workshop participant Jose Luis Villaseñor, Minnesota Pollution Control Agency

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APPENDICES

Appendix A: Inventory of local surveys used for analysis

Includes the most recent survey obtained and reviewed from each organization.

Organization	**Org Type**	**Year**	**Survey Title**	**Survey URL** (if available)
Apple Valley	City	2023	Residential Survey of Parks and Recreation Opinions	
Bloomington	City	2023	The National Community Survey	https://www.bloomingtonmn.gov/cs/national-community-survey
Brooklyn Center	City	2017	2017 Residential Survey	https://www.brooklyncentermn.gov/government/departments/administration/city-data-information/brooklyn-center-resident-surveys
Brooklyn Park	City	2023	2023 Residential Survey	https://www.brooklynpark.org/community-story/2023-resident-survey/
Burnsville	City	2021	2021 City of Burnsville Resident Engagement and Priority Study	
Carver	City	2020	2020 City of Carver Residential Survey	https://www.cityofcarver.com/218/Community-Survey
Champlin	City	2023	2023 Residential Survey	https://champlin.civicweb.net/Portal/MeetingInformation.aspx?Org=Cal&Id=461
Chaska	City	2018	2018 Residential Survey	https://www.chaskamn.gov/422/Community-Survey
Circle Pines	City	2021	2021 City of Circle Pines Survey	https://www.osa.state.mn.us/media/df1hs54t/circlepines2022resolutionresults.pdf
Columbia Heights	City	2022	2022 Residential Survey	https://www.columbiaheightsmn.gov/departments/city_manager_administration/public_survey_results.php
Coon Rapids	City	2016	N/A	https://www.coonrapidsmn.gov/CivicSend/ViewMessage/message/27071
Cottage Grove	City	2012	2012 City of Cottage Grove	https://www.osa.state.mn.us/media/fvlbdom3/cottagegrove2013resolutionresults.pdf
Cottage Grove	City	2016	Healthy Living for All Survey Responses	
Crystal	City	2022	Resident Survey	https://www.crystalmn.gov/cms/one.aspx?portalId=10879718&pageId=12705373

Eagan	City	2022	The National Community Survey	https://cityofeagan.com/survey
Eden Prairie	City	2023	Quality of Life Survey 2023	https://www.edenprairie.org/community/about-eden-prairie/quality-of-life
Edina	City	2023	City of Edina Resident Survey 2023	https://www.edinamn.gov/QuickLinks.aspx?CID=198
Elko New Market	City	2022		https://www.osa.state.mn.us/media/vomln5qc/elkonewmarket2023resolutionresults.pdf
Falcon Heights	City	2012	2012 City of Falcon Heights Citizen Survey	https://www.osa.state.mn.us/media/z4mh05ua/falconheights2013resolutionresults.pdf
Forest Lake	City	2015		https://www.osa.state.mn.us/media/gdrnw3oq/forestlake2015resolutionresults.pdf
Fridley	City	2021	2021 City of Fridley Resident Survey	https://www.ci.fridley.mn.us/1568/Resident-Survey
Golden Valley	City	2016	2016 City of Golden Valley Resident Survey	https://www.goldenvalleymn.gov/DocumentCenter/View/624/2016-Survey-Executive-Summary-PDF?bidId=
Hastings	City	2020	The National Community Survey	https://www.hastingsmn.gov/residents/surveys
Inver Grove Heights	City	2018	2018 Resident and Visitors Survey	https://www.ighmn.gov/853/Community-Survey
Lake Elmo	City	2022	2022 Residential Survey	https://polco.us/n/res/vote/lake-elmo-mn/2022-residential-survey?
Lakeville	City	2018	2018 Community Survey	https://www.lakevillemn.gov/891/2018-Community-Survey-Results
Little Canada	City	2011	2012 Community Survey	https://www.littlecanadamn.org/505/Community-Survey
Little Canada	City	2016	Performance Measurement Program	https://www.osa.state.mn.us/media/3zvn1cay/littlecanada2017resolutionresults.pdf
Little Canada	City	2018	2018 Community Survey	https://www.littlecanadamn.org/505/Community-Survey

Maple Grove	City	2022	2022 Community Survey	https://www.maplegrovemn.gov/190/Community-survey
Maplewood	City	2021	Maplewood Community Survey 2021	https://www.osa.state.mn.us/media/acufr3dt/maplewood2022resolutionresults.pdf
Mendota	City	2022		https://www.osa.state.mn.us/media/q5obrhz3/mendota2023resolutionresults.pdf
Minneapolis	City	2016	2016 Resident Survey	https://www2.minneapolismn.gov/government/departments/ncr/what-we-do/our-results/resident-survey/
Minneapolis	City	2022	Park and Recreation Board Survey	https://www.minneapolisparks.org/about-us/news/2022-citywide-survey/
Minnetonka	City	2023	2023 Residential Study	https://www.minnetonkamn.gov/Home/Components/News/News/1008/
Minnetrista	City	2017	Minnetrista Residential Study	
New Brighton	City	2022	2022 Resident Survey	https://www.newbrightonmn.gov/577/Resident-Surveys
New Hope	City	2022	2022 Residential Survey	https://www.newhopemn.gov/city_hall/city_manager/performance_measures
New Hope	City	2023	City Services Survey	https://www.newhopemn.gov/city_hall/city_manager/performance_measures
Newport	City	2021	2021 Residential Survey	https://www.newportmn.gov/residents/parks/index.php
North St. Paul	City	2013	Performance Measurement Program Report	https://www.osa.state.mn.us/media/f5oivzy0/northsaintpaul2013resolutionresults.pdf
Oakdale	City	2020	Community Livability Report	https://www.oakdalemn.gov/334/Community-Survey
Plymouth	City	2022	Community Survey	https://www.plymouthmn.gov/departments/administrative-services/communications/community-survey
Prior Lake	City	2022	The National Community Survey	https://www.priorlakemn.gov/how-do-i/search?q=survey
Ramsey	City	2020	Citizen Survey	https://www.ci.ramsey.mn.us/670/Citizen-Survey-Results

Richfield	City	2020	Richfield Community Survey	https://cms9files.revize.com/richfieldmn/Document_Center/Agendas%20&%20Minutes/City%20Council/2020/Work%20Session/04282020WorkSessionMateria.pdf
Robbinsdale	City	2023	Performance Measurement Survey	https://www.osa.state.mn.us/media/qibbag53/robbinsdale2023resolutionresults.pdf
Rogers	City	2019	Performance Measurement Survey	https://www.osa.state.mn.us/media/iwxpskxp/rogers2019resolutionresults.pdf
Rosemount	City	2021	Community Livability Report	https://www.rosemountmn.gov/591/Community-Survey
Roseville	City	2020	2020 Quality of Life Study	https://www.cityofroseville.com/2999/Community-Survey
Saint Anthony	City	2022	The National Community Survey	https://www.savmn.com/592/Community-Survey
Savage	City	2022	The National Community Survey	https://www.cityofsavage.com/our-city/about-savage/community-survey
Shakopee	City	2021	Community Livability Report	https://www.shakopeemn.gov/living-here/about-shakopee/community-survey
Shoreview	City	2022	The National Community Survey	https://public.tableau.com/app/profile/polco.nrc/viz/TheNCSReport-ShoreviewMN2022/About
Shorewood	City	2016	Performance Measurement Results	https://www.osa.state.mn.us/media/uwnblgu2/shorewood2016resolutionresults.pdf
South Saint Paul	City	2021	Performance Measurement Results	https://www.osa.state.mn.us/media/aggnmviy/southsaintpaul2022resolutionresults.pdf
Stillwater	City	2022	Public Works Poll	https://polco.us/n/res/vote/stillwater-mn/december-2022-public-works
Vadnais Heights	City	2021	2021 City of Vadnais Heights	https://www.cityvadnaisheights.com/885/2021-Community-Survey-Results
Victoria	City	2022	Community Livability Report	https://www.ci.victoria.mn.us/government/reports_and_documents/community_survey.php

Waconia	City	2011	Performance Measurement Report	https://www.osa.state.mn.us/media/zwmk3flx/waconia2012resolutionresults.pdf
West Saint Paul	City	2022	National Community Survey	https://www.wspmn.gov/AgendaCenter/ViewFile/Item/13740?fileID=20458
White Bear Lake	City	2011	Performance Measurement Results	https://www.osa.state.mn.us/media/fvkpliqa/whitebearlake2012resolutionresults.pdf
Woodbury	City	2022	2022 Resident Survey	https://www.woodburymn.gov/DocumentCenter/View/1488/2022-Woodbury-Resident-Survey-Report-PDF?bidId=
Dakota	County	2022	2022 Resident Survey	https://www.co.dakota.mn.us/Government/Analysis/ResidentSurvey/Documents/2022ResidentialSurvey.pdf
Dakota	County	2015	Park Visitor Survey	https://www.co.dakota.mn.us/Government/Analysis/ResidentSurvey/Documents/ParkVisitorSurveyReport.pdf
Dakota	County	2014	Recycling, Parks and Transit Survey	https://www.co.dakota.mn.us/Government/Analysis/ResidentSurvey/Documents/2014%20Special%20Focus%20Residential%20Survey.pdf
Scott	County	2022	2022 Resident Survey	https://www.scottcountymn.gov/DocumentCenter/View/18358/2022-Scott-County-Residents-Survey-PDF
Washington	County	2022	2022 Resident Survey	https://www.co.washington.mn.us/DocumentCenter/View/52907/Washington-County-Report-2022
Comfort Lake - Forest Lake	Watershed District	2020	Watershed Management Plan Update Public Survey	
Coon Creek	Watershed District	2020	Pleasure Creek Watershed Community Survey	https://www.wilder.org/sites/default/files/imports/CoonCreek_CommunitySurvey_5-20.pdf
Coon Creek	Watershed District	2021	Ditch 39 Subwatershed Community Survey	https://www.wilder.org/sites/default/files/imports/CoonCreek_Ditch39_CommunitySurvey_12-21.pdf
Coon Creek	Watershed District	2022	Beneficial Uses - Paired Comparison Survey	
Scott Watershed Management Organization	WMO	2012	Perspectives on Minnesota Water Resources: A Survey of Sand Creek and Vermillion River Watershed Landowners	https://conservancy.umn.edu/handle/11299/170664

Scott Watershed Management Organization	WMO	2019	Conservation Beliefs and Actions in the Sand Creek Watershed, Minnesota, USA	https://www.scottcountymn.gov/DocumentCenter/View/13468/FINAL_Sand-Creek-UofM-Survey-report-2019
Washington Conservation District	CD	2018	Input from Agricultural Stakeholders for Lower St. Croix 1W1P Plan	
Washington Conservation District	CD	2020	Conservation Project Survey	

Appendix B: Inventory of water-related questions

The following is a list of generalized questions pertaining to water that were found on community surveys done in Minnesota. The questions have been categorized into the general topics of water quality, general infrastructure, water and sewer utilities, storm water management and flooding, natural water resources, parks and recreation, sustainability, and public health. Municipalities may consider integrating one or more of these water resource questions into future survey instruments.

Water Quality		
Question	*Answer Type*	*Example Survey*
How would you rate the quality of the city's drinking water?	Excellent Good Only Fair Poor	Brooklyn Center
Do you think tap water is safe to drink?	Yes No	Fridley
Rate the following aspects of the drinking water: Taste Odor Hardness Color	Excellent Good Only Fair Poor	Edina

- Minnetrista asked residents about whether they thought water quality had improved because of additional water treatment plants.

General Infrastructure		
Question	*Answer Type*	*Example Survey*
How would you rate the quality of the overall utility infrastructure?	Excellent Good Only Fair Poor	Bloomington
How important, if at all, is it to focus on overall quality of utility infrastructure in the next few years?	Essential Very Important Somewhat Important Not At All Important	Hastings
What should be the highest priority for the City to focus on?	*Open Ended*	Columbia Heights
Are there any types of development you would like to see in the city?	*Open Ended*	Elko New Market

Would you favor or oppose an increase in city property taxes to enhance current city services or offer additional city services? What services would you like to see enhanced or offered?	Yes/No – *Open Ended*	Champlin
Do you think the quality of city services has been able to keep pace with the growth? What services, in particular, have not been able to keep pace?	Yes/ No - *Open Ended*	Carver

- Carver asks about funding a long-term investment project, repairing a levee on the Minnesota River.

Water and Sewer Utility		
Question	*Answer Type*	*Example Survey*
How would you rate the dependability and quality of the city water supply?	Excellent Good Only Fair Poor	Coon Rapids
To what extent, if at all, have you been concerned about having money to pay your heat, light, or water bill?	Not a Concern Minor Concern Moderate Concern Major Concern	Edina
How would you rate the dependability and quality of the city sanitary service?	Excellent Good Only Fair Poor	Circle Pines

- Brooklyn Park asks specific questions regarding residents' water softening process and discussion of whether softening should be added to the City's water treatment plant.

Storm Water Management and Flooding		
Question	*Answer Type*	*Example Survey*
How would you rate the quality of storm drainage and flood control?	Excellent Good Only Fair Poor	Eden Prairie
Do you view storm water drainage and flood control as an essential city service?	Very Important Somewhat Important Not Very Important Not Important At All	Little Canada
Do you view storm water management as something the city needs to take action on?	Very Important Somewhat Important Not Very Important	Minnetonka

	Not Important At All	
How does flooding impact your home?	My home is not affected My yard has standing water My house gets wet I don't know	Coon Creek

- Minneapolis Park and Recreation Board had many specific questions regarding residents' knowledge of stormwater fees and how it affects water quality.
- Vadnais Heights includes "storm water management" as a sustainability topic related to climate change rather than as a city service.

Natural Environment		
Question	*Answer Type*	*Example Survey*
How would you rate the overall quality of the natural environment in your city?	Excellent Good Fair Poor	Rosemount
How would you rate the city's job of preserving natural areas?	Excellent Good Fair Poor	Shakopee
How important, if at all, is it to focus on the overall natural environment in the next few years?	Essential Very Important Somewhat Important Not At All Important	Shakopee
What do you think is the most important environmental issue that needs to be addressed?	*Open Ended*	Golden Valley
How would you rate the quality of lakes, streams, beaches, wetlands, and rivers in your city?	Excellent Good Fair Poor	Maple Grove

Parks and Recreation		
Question	*Answer Type*	*Example Survey*

Do you or members of your household currently leave the city to participate in park and recreation activities? What activity?	Yes/ No - *Open Ended*	Brooklyn Center
How important is it for the City to improve the natural resource management to control invasive species and pollinator habitats and improve water quality?	Very Important Somewhat Important Not Too Important At at All Important	Fridley
Would you support a tax increase to improve access to waterways for water related recreation?	Strongly Support Somewhat Support Somewhat Oppose Strongly Oppose	Fridley
Would you support a tax increase to improve water recreation facilities such as beaches and swimming?	Very Important Somewhat Important Not Too Important At at All Important	Fridley
Would you support a tax increase to restore natural areas and improve natural resource management?	Very Important Somewhat Important Not Too Important At at All Important	Fridley

Sustainability		
Question	*Answer Type*	*Example Survey*
How would you rate the city's sustainability initiatives?	Excellent Good Fair Poor	Burnsville
How would you rate the quality of water conservation programs?	Excellent Good Fair Poor	Edina

How important, if at all, is it for the city to focus on water conservation programs?	Excellent Good Fair Poor	Edina
How important, if at all, is it for the city to focus on adapting to climate change?	Excellent Good Fair Poor	Edina
Indicate whether or not you have made efforts to conserve water in the last 12 months.	Yes No	Lakeville
To what degree, if at all, is the quantity of usable water supply a concern?	Not At All a Concern Minor Concern Moderate Concern Major Concern	Dakota
My personal actions can impact local water pollution.	Strongly Agree Agree Disagree Strongly Disagree	Coon Creek

- Champlin asks residents about their knowledge of lawn watering regulations.

Public Health		
Question	*Answer Type*	*Example Survey*
To what degree, if at all, are environmental hazards a health concern?	Not At All a Concern Minor Concern Moderate Concern Major Concern	Dakota

Appendix C. Email request for survey information

Dear Metro Area Public Works and Water Resource Professionals,

Have you surveyed your residents in the last 10 years? If so, we want to know! We are a research team from the University of Minnesota investigating the values and preferences for clean water in the Twin Cities metro.

In 2021-2022 we administered a survey of residential households in the Twin Cities Metro Area to learn more about their understanding of their water supply, perceived threats or concerns related to water services, familiarity with their water bill and local issues related to water in their communities, among other questions.

As part of our phase II research plan, we are interested in comparing the results of our survey work with insights from other local, regional, and national surveys. To that end, we are trying to identify any past surveys of customers conducted by water utilities, municipalities, or related entities over the last 10 years that asked questions about household awareness of water issues, perceived threats or concerns related to water supply, and/or any questions related to the values or priorities for clean water programming, funding, or infrastructure. Apologies to those who have already received this message and provided survey results.

The surveys we are looking for include:

- Community or quality of life surveys including questions about water services
- Surveys or questions related to amenities or activities at parks, including access to lakes and beaches or fishing

We have seen that many cities contract with companies like Polco, Morris Leatherman, or Wilder to do these surveys. Sometimes the cities themselves take on the task in order to submit Performance Measurement Standards to the Council on Local Results and Innovation. We know of at least 50 cities and 3 counties that have done surveys. Attached are two examples of a community survey done by Edina and Washington County.

Please help us by sharing final reports related to completed resident surveys. If possible, please include the entire survey documentation. Data must be collected within the last 10 years from any Twin Cities Metro location. We will extract and summarize survey responses related to perceived threats to water quality and availability, concerns about water affordability, and questions that help identify priority values or uses for water resource management.

What we'll do with the data: We will synthesize results from any metro area surveys and compare insights to national surveys (such as those conducted by the US Water Alliance or American Water Works Association). We want to understand how metro area consumers are similar or different to regional or national populations and if there are notable trends in water values and preferences across types of water service providers, geography, or water source.

What's in it for you? We hope that many of you will be interested in our findings - especially data on how local survey responses deviate or reinforce regional or national trends. We will send a copy of the final report and synthesis to any interested parties and host a webinar at the study conclusion to share our results.

In summary: If you or someone in your organization or network is aware of a quality of life or public services survey administered in the last 10 years and you're willing to share your results, please send a copy of the survey or final report. I'm also happy to hop on a call and share more about the project, answer questions, and help identify the appropriate data to share with our team. Many thanks in advance and feel free to forward this email to others in your network.

Best Regards, Research Team

Appendix D: Surveys that rate quality and dependability of their water supply and/or rate the quality of the water resources in their community

Organization	Year	% Positive rating on quality and/or dependability of their city water supply	% Positive rating on quality of the community water resources
Bloomington	2023	92%	83%
Brooklyn Center	2017	80%	84%
Brooklyn Park	2023	70%	
Carver	2020	66%	
Champlin	2023	87%	
Circle Pines	2021	85%	
Coon Rapids	2016	71%	
Crystal	2021	85%	
Eagan	2022	74%	85%
Eden Prairie	2023	81%	
Edina	2023	72%	
Falcon Heights	2012	95%	
Forest Lake	2015	83%	
Fridley	2021	85%	
Golden Valley	2016	96%	86%
Hastings	2020	50%	
Inver Grove Heights	2018	54%	
Lake Elmo	2022	50%	
Lakeville	2018	83%	
Little Canada	2016	100%	
Maple Grove	2022	54%	61%
Minneapolis	2016	88%	
Minnetonka	2023	96%	87%
Minnetrista	2017	66%	
New Brighton	2022	70%	

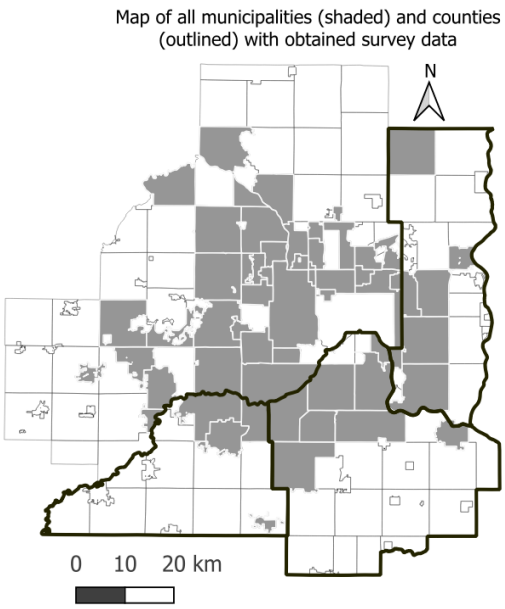
New Hope	2022	86%	
North Saint Paul	2013	89%	
Oakdale	2020	50%	62%
Plymouth	2022	69%	89%
Prior Lake	2022	79%	87%
Ramsey	2020	59%	54%
Richfield	2020	89%	81%
Robbinsdale	2023	70%	
Rogers	2019	72%	
Rosemount	2021	80%	48%
Roseville	2020	95%	
Saint Anthony	2022	68%	69%
Savage	2022	77%	52%
Shakopee	2021	60%	66%
Shoreview	2022	90%	93%
Shorewood	2016	84%	
South St. Paul	2021	70%	
Stillwater	2022	71%	
Vadnais Heights	2021	78%	
Victoria	2022	83%	84%
Waconia	2011	79%	
West Saint Paul	2021	79%	47%
White Bear Lake	2011	85%	
Woodbury	2022	41%	
Average		76% of respondents rated the quality and dependability of their city water supply as excellent or good (min 41%, max 100%, n=49).	73% of respondents rated the quality of the communities water resources as excellent or good (min 47% max 93%, n=19)

Appendix E: Summary Handout on Twin Cities Metro Area Municipal Surveys: A Review of Water Insights

See next page.

We obtained residential surveys conducted by municipalities, counties, and watershed districts over the last ten years, representing approximately 70% of metro area residents (see figure). The most common water-related question on these surveys asked residents about the quality and dependability of their water supply. Our review found that:

- **76% of respondents viewed their water supply as "excellent" or "good," and**
- **73% perceived water resources in their community as "excellent" or "good"**



On average, reported satisfaction with water resources in metro area communities **exceeded national averages** from surveys asking similar questions of U.S. households. We found some exceptions to these positive perceptions of water resource quality and water service delivery, primarily in communities where there has been significant media attention of localized water issues.

Surveys also suggest that water resources positively impact quality of life in metro area communities. Parks and lakes were rated among the "most liked attributes" of living in metro area counties. Residential surveys in the Twin Cities found that the quality of water in lakes and streams and the quality of drinking water were among the highest ranked environmental concerns.

Insights from a review of national surveys suggest that persistent disparities remain in access to a clean and safe water supply and in perceptions of water quality, especially among minority households. National surveys also suggest that receiving regular communication from water service providers increased positive perceptions of the quality of the local water supply and increased stated satisfaction with water services.[1]

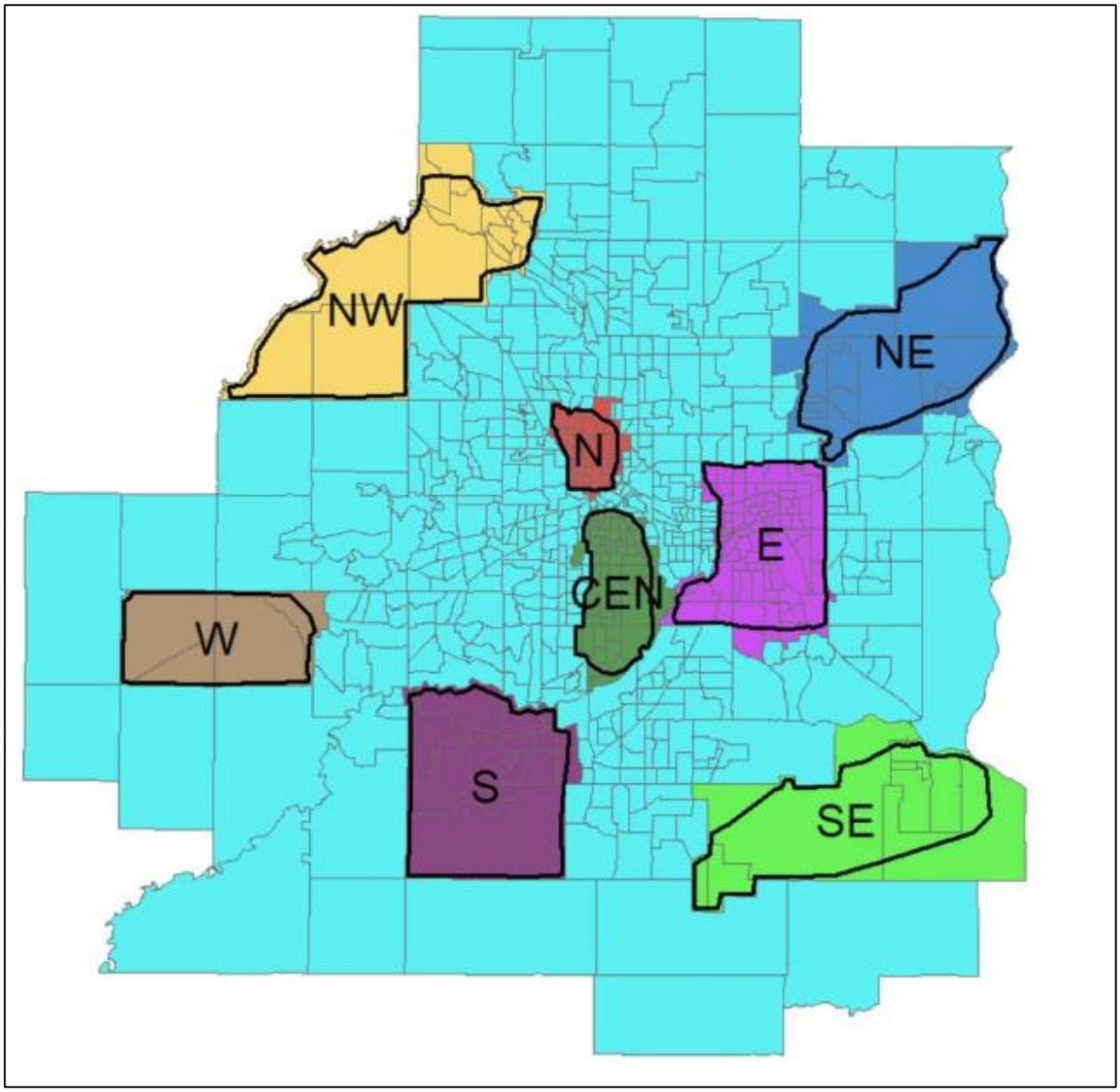
Recommendations:

Future surveys distributed by municipalities could contribute data on the consumption of bottled water versus tap water, perceived health or safety risks associated with degraded water quality, and preferences for further public investments in water resource management. Survey instruments should be designed to facilitate the comparison of water values, preferences, and behaviors among different demographic groups. We recommend collaborating with survey providers such as Polco or Morris Leatherman to develop standardized question formats to facilitate cross-municipality or region comparisons. If the Metropolitan Council is interested in having questions that compare to national surveys, we would recommend using suggestions from *Perceptions of Drinking Water Quality - A Review of the Literature and Surveys Covering the Topic*.[2]

[1] American Water Works Association. (2023, July 25). Tap water survey finds communication is key in consumer perception of safety. Retrieved from https://www.awwa.org/AWWA-Articles/tap-water-survey-finds-communication-is-key-in-consumer-perception-of-safety (accessed February 18, 2024).

[2] Sarkar, M. & SP Group LLC. (2022, April). *Perceptions of Drinking Water Quality - A Review of the Literature and Surveys Covering the Topic*. U.S. Department of Housing and Urban Development. Retrieved from https://www.huduser.gov/portal//portal/sites/default/files/pdf/Perceptions-of-Drinking-Water-Quality.pdf (accessed February 18, 2024).

Appendix F. Targeted communities for Phase I



Appendix G. Survey Questionnaire: Water, Community and You – 2021 Survey of Twin Cities Metro Area Residents

Researcher Only:

Are you willing to take the survey?

Yes

No

Next

0% 100%

Researcher Only:

Are you at least 18 years of age?

Yes

No

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Thank you for taking the time to answer questions about your community and your perspectives on water. The findings from this study will be used to help resource managers and community leaders understand residents' perspectives on the value of water and to facilitate improved communication and 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 6 minutes to complete the questionnaire.

Back Next

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Where do you primarily get your household drinking water?

- The tap - from a public water supplier (e.g., city)
- Purchased bottled water
- The tap - from my private well
- I don't know/not sure

Back Next

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Do you treat or filter your water at home? *(check all that apply)*

- Yes, a refrigerator filter system
- Yes, a sink filter system
- Yes, a water softener
- Yes, a whole house filter system
- Yes, a pitcher or similar water filter (e.g., Brita filter)
- No, we don't use any additional treatments
- No, we only drink purchased bottled water
- I don't know/not sure
- Other

Back Next

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

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
a. I like the way the drinking water out of my tap tastes.	○	○	○	○	○
b. I trust that my tap water is safe to drink.	○	○	○	○	○
c. I have reliable access to drinking water (i.e., water always flows when I turn on my tap.)	○	○	○	○	○
d. I am concerned about contaminants in my drinking water.	○	○	○	○	○

Back Next

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How much do you worry about the safety of drinking water from your tap at home?

- Not at all
- Only a little
- A fair amount
- A great deal

Back Next

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When it comes to water, to what extent do you trust or distrust the following sources of information? *(Check one box in each row.)*

	Strongly distrust	Somewhat distrust	Neither trust nor distrust	Somewhat trust	Strongly trust
a. My family	○	○	○	○	○
b. People in my community	○	○	○	○	○
c. My local or city government	○	○	○	○	○
d. My county government	○	○	○	○	○

	Strongly distrust	Somewhat distrust	Neither trust nor distrust	Somewhat trust	Strongly trust
e. My local environmental agencies (e.g., conservation districts or watershed management organizations)	○	○	○	○	○
f. Regional government (e.g., Metropolitan Council	○	○	○	○	○
g. Minnesota state agencies (e.g., Pollution Control Agency, Dept of Natural Resources, Dept of Health)	○	○	○	○	○
h. Federal government	○	○	○	○	○

	Strongly distrust	Somewhat distrust	Neither trust nor distrust	Somewhat trust	Strongly trust
i. Tribal government	○	○	○	○	○
j. Universities and other academic institutions	○	○	○	○	○
k. Environmental organizations	○	○	○	○	○
l. Media (e.g., newspaper, tv, internet, and social media)	○	○	○	○	○

Back Next

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How important to you is it to protect lakes and rivers for the following water values or uses? *(Please check one box in each row)*

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
a. Drinking water that is safe and clean	○	○	○	○	○
b. Equitable access to public waters for all Minnesotans	○	○	○	○	○
c. Anglers to be able to fish for preferred species	○	○	○	○	○
d. Future generations	○	○	○	○	○
e. High quality recreation opportunities for my or my family's use	○	○	○	○	○

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
f. Habitat for native fish and wildlife to survive	○	○	○	○	○
g. Consistent water supply for watering lawns and landscaping around my neighborhood	○	○	○	○	○
h. Avoid costly water treatment expenses	○	○	○	○	○
i. Natural systems and processes are sustained	○	○	○	○	○
j. Minnesota not to send water pollution downstream to other states or nations	○	○	○	○	○

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
k. Equitable access to clean drinking water	○	○	○	○	○
l. Consistent water supply for watering vegetable gardens	○	○	○	○	○
m. For cultural or religious practices	○	○	○	○	○
n. Consistent water supply to water-dependent industries like energy production and agriculture.	○	○	○	○	○

Back Next

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How familiar are you with water issues in or near your community? *(Check one.)*

- Not at all familiar
- Slightly familiar
- Moderately familiar
- Very familiar
- Extremely familiar

How important is it to you that you learn more about water issues in your community? *(Check one.)*

- Not at all important
- Slightly important
- Moderately important
- Very important
- Extremely important

Back Next

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How concerned are you about the following water issues in your community? *(Check one box in each row.)*

	Not at all concerned	Slightly concerned	Moderately concerned	Very concerned	Extremely concerned
a. Flooding in my community	○	○	○	○	○
b. Water that is not safe for drinking	○	○	○	○	○
c. Adequate water supply at home (e.g. drinking, watering plants)	○	○	○	○	○
d. Sanitary sewer or septic system problems	○	○	○	○	○

	Not at all concerned	Slightly concerned	Moderately concerned	Very concerned	Extremely concerned
e. Stormwater runoff	○	○	○	○	○
f. Lead pipes or lead exposure in my community's drinking water	○	○	○	○	○
g. Climate change impacts to water	○	○	○	○	○
h. Water in my basement or home	○	○	○	○	○

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How likely are you to take the following water protection actions in the next 12 months? *(Check one box in each row.)*

In the next 12 months, I intend to...

	Most certainly not	Probably not	Not sure/uncertain	Probably will	Most certainly will
a. Volunteer for a community organization or a water protection event.	○	○	○	○	○
b. Talk to others in my community about water issues or water protection activities.	○	○	○	○	○
c. Work with other community members to protect water in my community.	○	○	○	○	○
d. Take actions to support environmental justice.	○	○	○	○	○
e. Attend meetings or public hearings about water.	○	○	○	○	○

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What is your zip code?

Do you own or rent your current residence?

- Own
- Rent
- Other

How many people reside in your current household (including yourself)?

In what year were you born?

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To which gender identity do you most identify? *(Check one.)*

- Female
- Male
- Non-binary/gender non-conforming
- Prefer not to respond
- Other

Which category best describes you? (Please check all that apply)

American Indian or Alaska Native (For example, Minnesota Chippewa Tribe, Shakopee Mdewakanton Sioux, Navajo Nation, Mayan, Aztec, Nome Eskimo Community, etc.)	**Native Hawaiian or Other Pacific Islander** (For example, Native Hawaiian, Samoan, Chamorro, Tongan, Fijian, Marshallese, etc.)
Asian (For example, Chinese, Filipino, Asian Indian, Vietnamese, Hmong, Korean, Japanese, etc.)	**White** (For example, German, Irish, English, Italian, Polish, French, Swedish, Norwegian, etc.)
Black or African American (For example, African American, Jamaican, Haitian, Nigerian, Ethiopian, Somali, etc.)	**Multiracial or Biracial**
Hispanic, Latino, or Spanish heritage (For example, Mexican or Mexican American, Puerto Rican, Cuban, Salvadoran, Dominican, Colombian, etc.)	**A race, ethnicity or heritage not listed here (Please specify):**
Middle Eastern or North African (For example, Lebanese, Iranian, Egyptian, Syrian, Moroccan, Algerian, etc.)	**Prefer not to respond**

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Which of the following best describes your total household income from all sources in 2022, before taxes? *(Check one.)*

- Less than $20,000
- $20,000-$34,999
- $35,000-$49,999
- $50,000-$74,999
- $75,000-$99,999
- $100,000-$149,999
- $150,000 or more
- Prefer not to respond

Do you have any other comments about your community or water?

Back

Next

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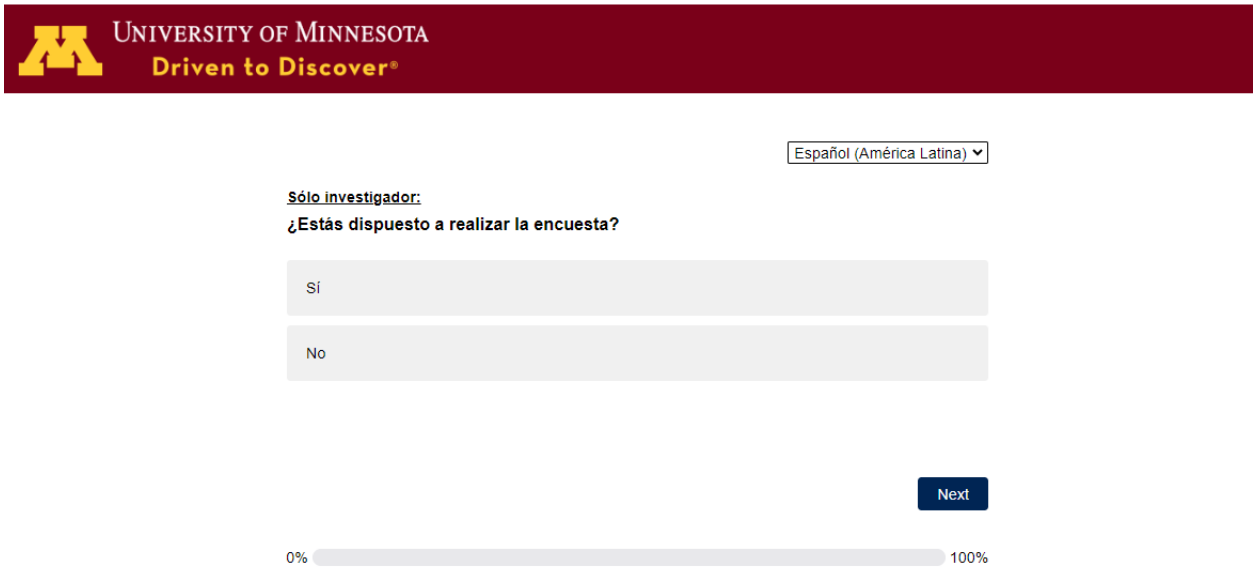
Onsite Survey Questionnaire – Spanish translation



Español (América Latina)

Le agradecemos el tiempo que se ha tomado para responder a nuestras preguntas sobre su comunidad y sus perspectivas sobre el agua. Los resultados de este estudio se utilizarán para ayudar a los administradores de recursos y a los líderes comunitarios a comprender las perspectivas de los residentes sobre el valor del agua y para facilitar el mejoramiento de la comunicación y los programas relacionado a los recursos naturales. Sus opiniones son muy valiosas para nosotros. **Esta encuesta es voluntaria y completamente confidencial.** Por favor responda a las siguientes preguntas lo más completamente posible. Le tomará aproximadamente 6 minutos para completar la encuesta.

Back Next

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Español (América Latina)

¿De dónde obtiene principalmente el agua potable en su hogar?

- El grifo/la llave - de un proveedor público de agua (p. ej., la ciudad)
- Agua embotellada comprada
- El grifo - de mi pozo privado
- No sé/no estoy seguro

Back Next

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Español (América Latina)

¿Trata o filtra el agua en su casa? *(marque todo lo que corresponda)*

- Sí, un sistema de filtro de agua del refrigerador
- Sí, un sistema de filtración para el grifo
- Sí, un ablandador de agua/suavizador de agua
- Sí, un sistema de filtro para toda la casa
- Sí, una jarra o filtro de agua similar (p. ej., filtro Brita)
- No, no usamos ningún tratamiento adicional
- No, solo bebemos agua embotellada comprada
- No sé/no estoy seguro
- Otro

Back Next

Español (América Latina)

¿Para cada una de las siguientes declaraciones, por favor indique hasta qué punto está de acuerdo o en desacuerdo? *(marque una casilla por cada opción)*

	Totalmente en desacuerdo	En desacuerdo	Ni de acuerdo, ni en desacuerdo	Algo de acuerdo	Totalmente de acuerdo
a. Me gusta el sabor del agua potable que sale de mi grifo.	○	○	○	○	○
b. Confío que mi agua del grifo este apta para el consumo.	○	○	○	○	○
c. Tengo acceso confiable a agua potable (es decir, el agua siempre fluye cuando abro el grifo).	○	○	○	○	○
d. Me preocupan los contaminantes en mi agua potable.	○	○	○	○	○

Back Next

Español (América Latina)

¿Le preocupa la calidad del agua potable en casa?

- Nunca
- Casi nunca
- A veces
- Muchísimo

Back Next

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Español (América Latina)

En su opinión, ¿Qué tan confiable es la información que recibe de las siguientes fuentes de información acerca del agua? *(marque una casilla por cada opción)*

	Extremadamente no confiable	No tan confiable	Indiferente	Algo confiable	Extremadamente confiable
a. Mi familia	○	○	○	○	○
b. La gente en mi comunidad	○	○	○	○	○
c. Mi gobierno local o municipal	○	○	○	○	○
d. Mi condado	○	○	○	○	○

	Extremadamente no confiable	No tan confiable	Indiferente	Algo confiable	Extremadamente confiable
e. Las agencias ambientales en mi comunidad (p. ej., distritos de conservación u organizaciones que se dedican al manejo de cuencas hidrográficas)	○	○	○	○	○
f. Gobierno regional (por ejemplo, el Consejo Metropolitano)	○	○	○	○	○
g. Agencias estatales de Minnesota (p. ej., Agencia de Control de la Contaminación, Departamento de Recursos Naturales, Departamento de Salud)	○	○	○	○	○
h.Gobierno federal	○	○	○	○	○

	Extremadamente no confiable	No tan confiable	Indiferente	Algo confiable	Extremadamente confiable
i. Gobiernos tribales	○	○	○	○	○
j. Universidades y otras instituciones académicas	○	○	○	○	○
k. Organizaciones ambientales	○	○	○	○	○
l. Los medios (p. ej., los periódicos, la televisión, el Internet y las redes sociales)	○	○	○	○	○

Back Next

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Español (América Latina)

¿Qué tan importante es para usted proteger los lagos y ríos para las siguientes razones? *(marque una casilla por cada opción)*

	No tan importante	Poco importante	Moderadamente importante	Muy importante	Extremadamente importante
a. Tener agua limpia para beber	○	○	○	○	○
b. Acceso equitativo a aguas públicas para todos los habitantes de Minnesota	○	○	○	○	○
c. Pescadores pueden pescar su especie preferida	○	○	○	○	○
d. Generaciones futuras	○	○	○	○	○
e. Oportunidades de recreación de alta calidad para mi uso o el de mi familia	○	○	○	○	○

	No tan importante	Poco importante	Moderadamente importante	Muy importante	Extremadamente importante
f. Hábitat para los peces nativos y la vida salvaje	○	○	○	○	○
g. Un constante suministro de agua para mi césped y los de mi vecindad	○	○	○	○	○
h. Prevenir tratamientos costosos relacionado al uso de agua	○	○	○	○	○
i. Manteniendo los sistemas y procesos naturales	○	○	○	○	○
j. Prevenir que Minnesota envíe agua contaminada a las comunidades aguas abajo, incluyendo a otros estados y naciones	○	○	○	○	○

	No tan importante	Poco importante	Moderadamente importante	Muy importante	Extremadamente importante
k. Acceso equitativo al agua potable	○	○	○	○	○
l. Un constante suministro de agua para los jardines	○	○	○	○	○
m. Para las prácticas culturales y religiosas	○	○	○	○	○
n. Un constante suministro de agua para las industrias dependientes del agua (p. ej., la producción de energía y la agricultura)	○	○	○	○	○

Español (América Latina)

¿Qué tan familiarizado está usted con los problemas del agua en su comunidad? *(Marque uno.)*

- Nada familiarizado
- Poco familiarizado
- Moderadamente familiarizado
- Muy familiarizado
- Extremadamente familiarizado

En su opinión, ¿Qué tan importante es que usted aprende más sobre los problemas del agua en su comunidad? *(Marque uno.)*

- No tan importante
- Poco importante
- Moderadamente importante
- Muy importante
- Extremadamente importante

Back Next

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Español (América Latina)

¿Qué tan preocupado esta usted con los siguientes problemas relacionado al uso y acceso de agua en su comunidad? *(marque una casilla por cada opción)*

	Nada preocupado	Algo preocupado	Moderadamente preocupado	Muy preocupado	Extremadamente preocupado
a. Inundaciones en mi comunidad	○	○	○	○	○
b. Agua no apta para el consumo	○	○	○	○	○
c. Suministro adecuado de agua en el hogar (p. ej., agua potable, agua para regar las plantas)	○	○	○	○	○
d. Problemas con los sistemas de drenaje/alcantarillado	○	○	○	○	○

	Nada preocupado	Algo preocupado	Moderadamente preocupado	Muy preocupado	Extremadamente preocupado
e. Escorrentía de aguas pluviales	○	○	○	○	○
f. Tuberías contaminadas con plomo o exposición al plomo en el agua potable de mi comunidad	○	○	○	○	○
g Impactos/efectos del cambio climático en el agua	○	○	○	○	○
h. Agua en mi sótano o casa	○	○	○	○	○

Back Next

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Español (América Latina)

¿En los próximos 12 meses, que tan probable es que usted tome las siguientes acciones para proteger el uso y la calidad de agua en su comunidad?

En los próximos 12 meses, tengo la intención de...

	De seguro no	Probablemente no	No estoy seguro	Algo probable	Extremadamente probable
a. Hacer trabajo voluntario para una organización local dedicada a la protección de agua.	○	○	○	○	○
b. Hablar con miembros de mi comunidad sobre problemas relacionados con el agua o actividades para proteger el agua.	○	○	○	○	○
c. Trabajar con miembros de mi comunidad para proteger el agua.	○	○	○	○	○
d. Tomar acciones para apoyar la justicia medioambiental.	○	○	○	○	○
e. Asistir en juntas o audiencias públicas sobre el agua.	○	○	○	○	○

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Español (América Latina)

¿Cuál es su código postal?

¿Es propietario o alquila su residencia actual?

- Propietario
- inquilino
- Otro

¿Cuántas personas viven en su hogar actual (incluyéndose a sí mismo)?

¿En que año nació?

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Español (América Latina)

¿Con qué género se identifica más? *(Marque uno.)*

- Femenino
- Masculino
- No binario/género no conforme
- Prefiero no responder
- Otro

¿Cuál de estas opciones lo describiría mejor? (Por favor marque todos los que apliquen)

Indio americano o nativo de Alaska (por ejemplo, tribu Chippewa de Minnesota, sioux de Shakopee Mdewakanton, nación navajo, maya, azteca, comunidad esquimal de Nome, etc.)	**Nativo de Hawái u otras islas del Pacífico** (por ejemplo, nativo de Hawái, samoano, chamorro, tongano, fijiano, marshalés, etc.)
Asiático (por ejemplo, chino, filipino, indio asiático, vietnamita, hmong, coreano, japonés, etc.)	**Blanco** (por ejemplo, alemán, irlandés, inglés, italiano, polaco, francés, sueco, noruego, etc.)
Negro o afroamericano (por ejemplo, afroamericano, jamaiquino, haitiano, nigeriano, etíope, somalí, etc.)	**Multirracial o birracial**
Herencia hispana, latina o española (por ejemplo, mexicana o mexicoamericana, puertorriqueña, cubana, salvadoreña, dominicana, colombiana, etc.)	**Una raza, etnia o ascendencia no enumerada aquí (especifique):**
Medio Oriente o África del Norte (por ejemplo, libanés, iraní, egipcio, sirio, marroquí, argelino, etc.)	**Prefiero no responder**

Back Next

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Español (América Latina)

Indique el rango de ingresos que ganó su familia en 2022, antes de impuestos. *(Marque uno.)*

- Menos de $20,000
- $20,000-$34,999
- $35,000-$49,999
- $50,000-$74,999
- $75,000-$99,999
- $100,000-$149,999
- $150,000 o más
- Prefiero no responder

¿Tiene algún otro comentario sobre su comunidad o el agua?

Back Next

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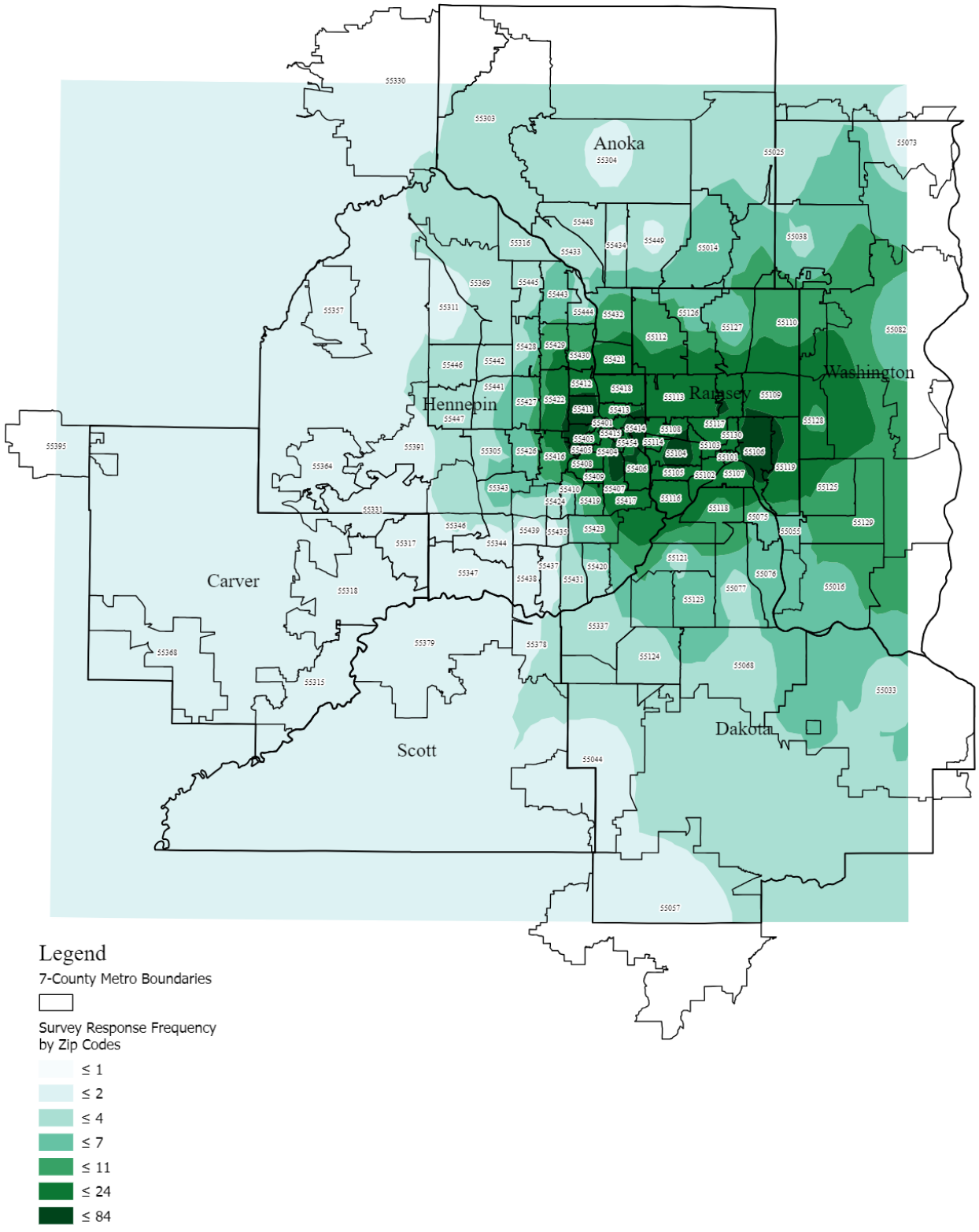
Appendix H. Community events

Date	Event	Languages offered
May 27, 2023	Spring Fling – Celestial Gardens	English, Spanish
June 3, 2023	WaterFest	English, Spanish
June 17, 2023	Cultural Garden Gathering	English, Spanish
June 23, 2023	We are Water MN/Somali Museum Exhibit Opening Event	English, Spanish, Somali
July 1-2, 2023	Hmong International Freedom Festival	English, Spanish
July 16	Open Streets Glenwood	English, Spanish
August 1	National Night Out – Minneapolis Fourth Street Community Festival	English, Spanish, French, Mandarin
August 6	Little Africa Festival and Parade	English, Spanish, French, Mandarin
August 6	Wakaŋ Tipi Awaŋyaŋkapi Pollinator Festival	English, Spanish, Mandarin
August 19	Frogtown Arts Festival	English, Spanish, French
August 20	Open Streets Cedar Riverside	English, Spanish, French, Somali
September 16	CLUES Fiesta Latina	English, Spanish
September 16	Open Streets West Broadway	English, French, Mandarin
October 7	Owámni: Falling Water Festival	English, Spanish

Appendix I. Map of respondents' residence by ZIP code



Appendix J. Onsite Survey Data Tables

Table J1. Respondents' sociodemographic characteristics

Sociodemographic characteristics		N	Percent
Gender identity*	Female	568	55.3
	Male	383	37.3
	Non-binary/gender non-conforming	46	4.5
	Prefer not to respond	29	2.8
	Other	2	0.2
Race/ethnicity*	White	372	32.7
	Hispanic, Latino, or Spanish heritage	113	9.9
	Black or African American	226	19.9
	Asian	203	17.9
	American Indian or Alaska Native	78	6.9
	Middle Eastern or North African	8	0.70
	Native Hawaiian or Other Pacific Islander	8	0.70
	A race, ethnicity or heritage not listed here	17	1.5
	Prefer not to respond	32	2.8
	Multiracial or Biracial	79	7.0
Age	Mean	40	-
	Median	36	-
	Min	18	-
	Max	98	-
Total household income	Less than $20,000	146	14.2
	$20,000-$34,999	115	11.2
	$35,000-$49,999	127	12.3
	$50,000-$74,999	191	18.5
	$75,000-$99,999	123	11.9
	$100,000-$149,999	142	13.8
	$150,000 or more	100	9.7
	Prefer not to respond	86	8.3

*Respondents could select more than one response.
N=944-1039

Table J2. Respondents' reported current residence

	N	Percent[a]
Own	479	46.1
Rent	485	46.7
Other	75	7.2

Source: Urban Water Values Phase II Onsite Survey
Survey question: Do you own or rent your current residence?
[a]Percentages based on number of respondents that responded to the survey question
N=1039

Table J3. Number of people residing in respondents' current household

	N	Percent[a]	Mean	Median	Min	Max
1	175	16.7	37.3	3	0	31970
2	305	29.1				
3-4	294	28.0				
5-6	150	14.3				
7+	122	11.6				

Source: Urban Water Values Phase II Onsite Survey
Survey question: How many people reside in your current household (including yourself)?
[a]Percentages based on number of respondents that responded to the survey question
N=1049

Table J4. Respondents' primary household drinking water source

	N	Percent[a]
The tap – from a public water supplier (e.g., city)	700	67.2
Purchased bottled water	297	28.5
The tap – from my private well	33	3.2
I don't know/not sure	12	1.2

Source: Urban Water Values Phase II Onsite Survey
Survey question: Where do you primarily get your household drinking water?
[a]Percentages based on number of respondents that responded to the survey question
N=1042

Table J5. Respondents' use of drinking water filter or treatments*

	N	Percent[a]
Yes, a refrigerator filter system	189	18.1
Yes, a sink filter system	136	13.0
Yes, a water softener	73	7.0
Yes, a whole house filter system	49	4.7
Yes, a pitcher or similar water filter (e.g., Brita filter)	188	18.0
No, we don't use any additional treatments	335	32.0
No, we only drink purchased bottled water	145	13.9
I don't know/not sure	44	4.2
Other	15	1.4

Source: Urban Water Values Phase II Onsite Survey
Survey question: Do you treat or filter your water at home?
*Respondents could select more than one response
[a]Percentages based on number of respondents that responded to the survey question
N=1049

Table J6. Respondents' perceptions of drinking water

	N	Mean*	SD[a]	Strongly disagree[b]	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I like the way the drinking water out of my tap tastes.	1028	3.41	1.39	15	12.5	16.3	29.4	26.8
I trust that my tap water is safe to drink.	1014	3.44	1.39	14.3	13.3	14.3	30.7	27.4
I have reliable access to drinking water (i.e., water always flows when I turn on my tap.)	1010	4.21	1.18	6.1	4.3	8.1	22.6	58.3
I am concerned about contaminants in my drinking water.	1011	3.44	1.35	12.8	14.1	15.7	31.1	26.3

Source: Urban Water Values Phase II Onsite Survey
Survey question: To what extent do you agree or disagree with the following?
*Responses based on a 5-point scale from strongly disagree (1) to strongly agree (5)
[a]SD=Standard deviation
[b]Percent

Table J7. Respondents' perceptions of tap water safety

N	Mean*	SD[a]	Not at all[b]	Only a little	A fair amount	A great deal
1041	2.27	1.02	25.9	36.6	21.5	15.9

Source: Urban Water Values Phase II Onsite Survey
Survey question: How much do you worry about the safety of drinking water from your tap at home?
*Responses based on a 5-point scale from strongly disagree (1) to strongly agree (5)
[a]SD=Standard deviation
[b]Percent

Table J8. Respondents' level of trust in information sources

	N	Mean*	SD[a]	Strongly distrust[b]	Somewhat distrust	Neither trust nor distrust	Somewhat trust	Strongly trust
Environmental organizations	1012	3.98	1.03	3.3	5.9	16.2	38.6	36
Universities and other academic institutions	1013	3.93	1.03	3.5	6	17.8	39.4	33.4
My local environmental agencies (e.g., conservation districts or watershed management organizations)	1028	3.87	1.11	4.5	8.3	17.4	35.8	34
My family	1027	3.84	1.13	5.1	6.8	22.5	30.7	35
People in my community	1009	3.72	0.98	3.4	7.3	23.5	45.6	20.2
Minnesota state agencies (e.g., Pollution Control Agency, Dept of Natural Resources, Dept of Health)	1020	3.71	1.15	6.3	9.9	17.8	38.4	27.5
Tribal government	996	3.63	1.01	3.8	5.5	37.1	31.1	22.4
Regional government (e.g., Metropolitan Council	1017	3.48	1.11	6.4	13.1	23.2	40.6	16.7
My local or city government	1018	3.42	1.21	9.5	13.9	19.7	38.6	18.3
My county government	1011	3.39	1.24	10.8	13.4	20.4	36.8	18.7
Federal government	999	3.16	1.22	12.8	16.8	23.6	34.6	12.1
Media (e.g., newspaper, tv, internet, and social media)	1016	3.04	1.11	10.6	19.6	33.5	28.1	8.2

Source: Urban Water Values Phase II Onsite Survey
Survey question: When it comes to water, to what extent do you trust or distrust the following sources of information?
*Responses based on a 5-point scale from strongly distrust (1) to strongly trust (5)
[a]SD=Standard deviation
[b]Percent

Table J9. Respondents' reported water protection values and uses

	N	Mean*	SD[a]	Not at all important[b]	Slightly important	Moderately important	Very important	Extremely important
Future generations	1013	4.68	0.74	1.2	1.6	4.2	14.4	78.6
Equitable access to clean drinking water	1027	4.65	0.74	1.1	1.8	4.6	15.9	76.7
Drinking water that is safe and clean	1032	4.63	0.81	2.2	1.4	3.5	16.7	76.3
Equitable access to public waters for all Minnesotans	1022	4.6	0.74	0.9	1.9	4.6	21.2	71.4
Habitat for native fish and wildlife to survive	1024	4.59	0.76	1.1	1.6	6	19.6	71.8
Minnesota not to send water pollution downstream to other states or nations	1015	4.52	0.82	1	2.2	8.5	20.3	68.1
Natural systems and processes are sustained	1013	4.49	0.82	1.1	1.7	9.4	23.1	64.8
Consistent water supply for watering vegetable gardens	1019	4.13	1.01	1.6	6	17.4	28	47.1
High quality recreation opportunities for my or my family's use	1018	4.12	1.04	2.3	6	17.5	26.4	47.8
For cultural or religious practices	1021	4	1.14	4.3	6.8	18.6	25.8	44.6
Consistent water supply to water-dependent industries like energy production and agriculture.	1014	3.97	1.11	3.1	8	20.3	25.9	42.7
Avoid costly water treatment expenses	1012	3.95	1.12	2.8	9.3	20.5	24.7	42.8
Anglers to be able to fish for preferred species	1013	3.61	1.30	8.6	12.4	22.7	22.2	34.1
Consistent water supply for watering lawns and landscaping around my neighborhood	1021	3.44	1.46	14.6	14.4	18.6	16.9	35.5

Source: Urban Water Values Phase II Onsite Survey
Survey question: How important to you is it to protect lakes and rivers for the following water values or uses?
*Responses based on a 5-point scale from not at all important (1) to extremely important (5)
[a]SD=Standard deviation
[b]Percent

Table J10. Respondents' familiarity with local water issues

N	Mean*	SD[a]	Not familiar at all[b]	Slightly familiar	Moderately familiar	Very familiar	Extremely familiar
1045	2.46	1.10	21.7	31.7	29.9	12.1	4.7

Source: Urban Water Values Phase II Onsite Survey
Survey question: How familiar are you with water issues in or near your community?
*Responses based on a 5-point scale from not familiar at all (1) to extremely familiar (5)
[a]SD=Standard deviation
[b]Percent

Table J11. Respondents' reported importance of learning more about local water issues

N	Mean*	SD[a]	Not at all important[b]	Slightly important	Moderately important	Very important	Extremely important
1037	3.65	1.05	2.8	12.8	23.7	38.4	22.3

Source: Urban Water Values Phase II Onsite Survey
Survey question: How important is it to you that you learn more about water issues in your community?
*Responses based on a 5-point scale from not at all important (1) to extremely important (5)
[a]SD=Standard deviation
[b]Percent

Table J12. Respondents' reported concern about local water issues

	N	Mean*	SD[a]	Not at all concerned[b]	Slightly concerned	Moderately concerned	Very concerned	Extremely concerned
Climate change impacts to water	1017	4.16	1.08	2.8	6.8	14.2	24.4	51.9
Lead pipes or lead exposure in my community's drinking water	1027	3.8	1.20	4.5	12.9	19.1	25.8	37.8
Water that is not safe for drinking	1017	3.59	1.31	8.8	13.8	20.9	22.3	34.2
Sanitary sewer or septic system problems	1004	3.47	1.34	11.5	13.3	21.8	23.3	30.1
Stormwater runoff	1012	3.43	1.24	8.7	14.2	26.3	26.7	24.1
Adequate water supply at home (e.g. drinking, watering plants)	1017	3.37	1.40	14.7	13.2	20.7	23.1	28.2
Water in my basement or home	1014	3.18	1.44	17.6	16.9	21	18.7	25.8
Flooding in my community	1031	2.81	1.35	22.9	19.3	27.2	15.7	14.9

Source: Urban Water Values Phase II Onsite Survey
Survey question: How concerned are you about the following water issues in your community?
*Responses based on a 5-point scale from not at all concerned (1) to extremely concerned (5)
[a]SD=Standard deviation
[b]Percent

Table J13. Respondents' reported intention to take water protection actions in the next 12 months

	N	Mean*	SD[a]	Most certainly not[b]	Probably not	Not sure/uncertain	Probably will	Most certainly will
Take actions to support environmental justice.	1017	3.72	1.069	3.6	9.4	25.1	35.3	26.5
Talk to others in my community about water issues or water protection activities.	1016	3.52	1.063	3.3	15.1	26.8	35.9	18.9
Work with other community members to protect water in my community.	1013	3.4	1.079	4.3	15.9	31.9	30.7	17.2
Attend meetings or public hearings about water.	1014	3.31	1.094	5.6	17	33.5	28.6	15.3
Volunteer for a community organization or a water protection event.	1029	3.16	1.117	7	21.8	32.9	25.3	13

Source: Urban Water Values Phase II Onsite Survey
Survey question: How likely are you to take the following water protection actions in the next 12 months? In the next 12 months, I intend to…
*Responses based on a 5-point scale from most certainly not (1) to most certainly will (5)
[a]SD=Standard deviation
[b]Percent

Appendix K. Subgroup comparisons

Table K1. Comparisons of drinking water treatment across race and ethnicity

	Water treatment		No water treatment		
Race[a]	**N**	**%**	**N**	**%**	**X^2**
White	145	48.0	157	52.0	
Hispanic, Latino, or Spanish heritage	49	72.1	19	27.9	
Black or African American	107	69.5	47	30.5	54.29*
Asian	114	81.4	26	18.6	
American Indian or Alaska Native	23	62.2	14	37.8	

Source: Urban Water Values Phase II Onsite Survey
[a]Based on an aggregate of survey question: Do you treat or filter your water at home?
[b]Based on an aggregate of survey question: Which category best describes you?
*significance level of $p \leq 0.01$

Table K2. Differences across race and ethnicity subgroups in their concern and trust in their drinking water.

	Race[a]	N	Mean[b]	SD	F
I like the way the drinking water out of my tap tastes	White	328	3.96[x]	0.067	19.99*
	Hispanic, Latino, or Spanish heritage	85	3.29[y]	0.147	
	Black or African American	191	3.01[y]	0.106	
	Asian	175	3.22[y]	0.092	
	American Indian or Alaska Native	49	3.29[y]	0.206	
I trust that my tap water is safe to drink	White	325	3.95[x]	0.066	16.97*
	Hispanic, Latino, or Spanish heritage	82	3.43[y]	0.146	
	Black or African American	184	3.05[y]	0.108	
	Asian	175	3.27[y]	0.099	
	American Indian or Alaska Native	49	3.29[y]	0.184	
I have reliable access to drinking water (i.e., water always flows when I turn on my tap)	White	323	4.65[x]	0.050	18.35*
	Hispanic, Latino, or Spanish heritage	82	4.24[y]	0.126	
	Black or African American	185	3.86[y]	0.097	
	Asian	175	4.03[y]	0.086	
	American Indian or Alaska Native	49	4.04[y]	0.165	
I am concerned about contaminants in my drinking water	White	326	3.28[x]	0.072	1.92
	Hispanic, Latino, or Spanish heritage	81	3.54[x]	0.145	
	Black or African American	184	3.43[x]	0.106	
	Asian	175	3.57[x]	0.100	
	American Indian or Alaska Native	49	3.65[x]	0.195	

Source: Urban Water Values Phase II Onsite Survey
Survey question: To what extent do you agree or disagree with the following?
[a]Based on an aggregate of survey question: Which category best describes you?
F = statistic in Analysis of Variance (ANOVA) to assess statistically significant differences among race/ethnicity groups
[b]Responses based on a 5-point scale from strongly disagree (1) to strongly agree (5); SD=Standard deviation; Means with different superscripts are statistically different; means with same superscripts are not statistically different.
*Statistically significant differences at p<0.01

Table K3. Differences between White and BIPOC respondents in their concern and trust in their drinking water.

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
I like the way the drinking water out of my tap tastes.	White-Only BIPOC	328 700	3.96 3.15	1.22 1.39	9.60*
I trust that my tap water is safe to drink.	White-Only BIPOC	325 689	3.95 3.19	1.19 1.41	8.90*
I have reliable access to drinking water (i.e., water always flows when I turn on my tap.)	White-Only BIPOC	323 687	4.65 4.01	0.90 1.24	-9.24*
I am concerned about contaminants in my drinking water.	White-Only BIPOC	326 685	3.28 3.52	1.30 1.37	-2.62*

Source: Urban Water Values Phase II Onsite Survey
Survey question: To what extent do you agree or disagree with the following?
[a]Based on an aggregate of survey question: Which category best describes you?
[b]Items measured on a five-point scale from strongly disagree (1) to strongly agree (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$
SD = Standard deviation

Table K4. Differences between homeowners and renters in their concern and trust in their drinking water.

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
I like the way the drinking water out of my tap tastes.	Own Rent	475 474	3.73 3.08	1.29 1.42	7.34*
I trust that my tap water is safe to drink.	Own Rent	471 463	3.66 3.22	1.34 1.41	4.84*
I have reliable access to drinking water (i.e., water always flows when I turn on my tap.)	Own Rent	470 460	4.35 4.09	1.13 1.21	3.35*

Source: Urban Water Values Phase II Onsite Survey
Survey question: To what extent do you agree or disagree with the following?
[a]Based on survey question: do you own or rent your current residence?
[b]Items measured on a five-point scale from strongly disagree (1) to strongly agree (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$;
SD = Standard deviation

Table K5. Differences between subgroups in their concern and trust in their drinking water.

Survey item	Subgroups	N	Mean[c]	SD	t[d]
How much do you worry about the safety of drinking water from your tap at home?	White-Only[a]	328	1.90	0.87	-8.96*
	BIPOC	713	2.45	1.04	
	Own[b]	478	2.15	1.03	-4.32*
	Rent	480	2.43	1.02	

Source: Urban Water Values Phase II Onsite Survey
Survey question: To what extent do you agree or disagree with the following?
[a]Based on an aggregate of survey question: Which category best describes you?
[b]Based on survey question: do you own or rent your current residence?
[c]Items measured on a four-point scale from not at all (1) to a great deal (4)
[d]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$
SD = Standard deviation

Table K6. Differences between race and ethnicity subgroups in concern about local water issues.

Survey Item	Race[a]	N	Mean[b]	SD	F
Flooding in my community	White	327	2.40[x]	1.193	18.85*
	Hispanic, Latino, or Spanish heritage	85	3.06[y]	1.400	
	Black or African American	191	3.33[y]	1.437	
	Asian	178	3.11[y]	1.242	
	American Indian or Alaska Native	49	2.86[xy]	1.354	
Water that is not safe for drinking	White	326	3.30[x]	1.306	9.60*
	Hispanic, Latino, or Spanish heritage	84	3.86[y]	1.272	
	Black or African American	184	3.84[y]	1.239	
	Asian	177	3.86[y]	1.135	
	American Indian or Alaska Native	50	3.86[y]	1.370	
Adequate water supply at home (e.g. drinking, watering plants)	White	325	2.98[x]	1.446	13.36*
	Hispanic, Latino, or Spanish heritage	82	3.57[y]	1.334	
	Black or African American	185	3.76[y]	1.180	
	Asian	178	3.60[y]	1.330	
	American Indian or Alaska Native	49	3.78[y]	1.295	
Sanitary sewer or septic system problems	White	325	3.08[x]	1.357	13.39*
	Hispanic, Latino, or Spanish heritage	80	3.79[y]	1.309	
	Black or African American	182	3.82[y]	1.224	
	Asian	177	3.70[y]	1.264	
	American Indian or Alaska Native	50	3.70[y]	1.313	
Stormwater runoff	White	323	3.34[x]	1.162	2.18
	Hispanic, Latino, or Spanish heritage	83	3.33[x]	1.289	
	Black or African American	185	3.64[x]	1.286	
	Asian	176	3.49[x]	1.200	
	American Indian or Alaska Native	50	3.58[x]	1.247	
Lead pipes or lead exposure in my community's drinking water	White	327	3.69[x]	1.169	2.80
	Hispanic, Latino, or Spanish heritage	84	3.82[xy]	1.282	
	Black or African American	187	4.04[y]	1.126	
	Asian	177	3.83[xy]	1.170	
	American Indian or Alaska Native	50	3.94[xy]	1.168	
Climate change impacts to water	White	327	4.33[x]	0.937	3.13
	Hispanic, Latino, or Spanish heritage	83	4.31[xy]	0.923	
	Black or African American	185	4.10[xy]	1.084	
	Asian	175	4.05[y]	1.116	
	American Indian or Alaska Native	49	4.10[xy]	1.026	
Water in my basement or home	White	324	2.71[x]	1.345	20.54*
	Hispanic, Latino, or Spanish heritage	83	3.71[y]	1.478	
	Black or African American	185	3.58[y]	1.381	
	Asian	178	3.60[y]	1.338	
	American Indian or Alaska Native	50	3.18[xy]	1.395	

Source: Urban Water Values Phase II Onsite Survey
Survey question: How concerned are you about the following water issues in your community?
[a]Based on an aggregate of survey question: Which category best describes you?
F = statistic in Analysis of Variance (ANOVA) to assess statistically significant differences among race/ethnicity groups
[b]Responses based on a 5-point scale from not at all concerned (1) to extremely concerned (5); SD=Standard deviation; Means with different superscripts are statistically different at the 0.05 level; means with same superscripts are not statistically different.
*Statistically significant differences at p<0.01

Table K7. Differences between White and BIPOC respondents in concern about local water issues.

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
Flooding in my community	White-Only	327	2.40	1.19	-7.10*
	BIPOC	704	2.99	1.38	
Water that is not safe for drinking	White	326	3.30	1.31	-5.00*
	BIPOC	691	3.74	1.30	
Adequate water supply at home (e.g. drinking, watering plants)	White-Only	325	2.98	1.45	-6.00*
	BIPOC	692	3.55	1.33	
Sanitary sewer or septic system problems	White-Only	325	3.08	1.36	6.37*
	BIPOC	679	3.66	1.30	
Climate change impacts to water	White-Only	327	4.33	0.94	3.75*
	BIPOC	690	4.08	1.13	
Water in my basement or home	White-Only	324	2.71	1.35	-7.56*
	BIPOC	690	3.41	1.42	

Source: Urban Water Values Phase II Onsite Survey
Survey question: How concerned are you about the following water issues in your community?
[a]Based on an aggregate of survey question: which category best describes you?
[b]Items measured on a five-point scale from not at all concerned (1) to extremely concerned (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Table K8. Differences between owners and renters in concern about local water issues.

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
Flooding in my community	Own	476	2.68	1.29	-2.70*
	Rent	475	2.92	1.40	

Source: Urban Water Values Phase II Onsite Survey
Survey question: How concerned are you about the following water issues in your community?
[a]Based on survey question do you own or rent your current residence?
[b]Items measured on a five-point scale from not at all concerned (1) to extremely concerned (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Table K9. Differences between young and old respondents in concern about local water issues.

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
Water that is not safe for drinking	Young	497	3.77	1.31	4.10*
	Old	520	3.43	1.30	
Adequate water supply at home (e.g. drinking, watering plants)	Young	496	3.53	1.39	3.58*
	Old	521	3.22	1.38	
Sanitary sewer or septic system problems	Young	489	3.64	1.34	3.98*
	Old	515	3.31	1.33	
Stormwater runoff	Young	493	3.63	1.18	4.97*
	Old	519	3.25	1.27	
Lead pipes or lead exposure in my community's drinking water	Young	498	3.96	1.15	4.19*
	Old	529	3.64	1.23	
Climate change impacts to water	Young	496	4.27	1.03	3.23*
	Old	521	4.05	1.11	

Source: Urban Water Values Phase II Onsite Survey
Survey question: How concerned are you about the following water issues in your community?
[a]Based on an aggregate of survey question: in what year were you born; split at the median value of 36 years old
[b]Items measured on a five-point scale from not at all concerned (1) to extremely concerned (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Table K10. Differences between White and BIPOC respondents in their trust in information sources.

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
People in my community	White-Only	326	3.87	0.85	3.52*
	BIPOC	683	3.65	1.03	
My local or city government	White-Only	328	3.79	1.04	7.21*
	BIPOC	690	3.25	1.24	
My county government	White	326	3.72	1.09	6.25*
	BIPOC	685	3.24	1.27	
My local environmental agencies (e.g., conservation districts or watershed management organizations)	White-Only	328	4.34	0.83	10.94*
	BIPOC	700	3.65	1.16	
Regional government (e.g., Metropolitan Council	White-Only	327	3.75	1.02	5.51*
	BIPOC	690	3.36	1.13	
Minnesota state agencies (e.g., Pollution Control Agency, Dept of Natural Resources, Dept of Health)	White-Only	327	4.11	0.98	8.28*
	BIPOC	693	3.52	1.18	
Tribal government	White-Only	319	3.86	0.89	5.39*
	BIPOC	677	3.52	1.05	
Universities and other academic institutions	White-Only	327	4.37	0.76	10.99*
	BIPOC	686	3.72	1.07	
Environmental organizations	White-Only	328	4.41	0.72	11.16*
	BIPOC	684	3.77	1.09	

Source: Urban Water Values Phase II Onsite Survey
Survey question: When it comes to water, to what extent do you trust or distrust the following sources of information?
[a]Based on an aggregate of survey question: which category best describes you?
[b]Items measured on a five-point scale from strongly distrust (1) to strongly trust (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Table K11. Differences between homeowners and renters in their trust in information sources.

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
My local or city government	Own	472	3.56	1.15	3.94*
	Rent	467	3.25	1.25	
My county government	Own	475	3.53	1.17	3.87*
	Rent	457	3.22	1.28	
My local environmental agencies (e.g., conservation districts or watershed management organizations)	Own	476	3.99	1.03	3.24*
	Rent	472	3.75	1.17	
Regional government (e.g., Metropolitan Council	Own	472	3.63	1.08	4.20*
	Rent	464	3.33	1.12	
Minnesota state agencies (e.g., Pollution Control Agency, Dept of Natural Resources, Dept of Health)	Own	473	3.84	1.12	3.58*
	Rent	466	3.57	1.17	
Federal government	Own	464	3.28	1.16	3.27*
	Rent	455	3.02	1.27	
Universities and other academic institutions	Own	474	4.05	0.95	3.63*
	Rent	458	3.81	1.09	
Environmental organizations	Own	473	4.09	0.95	3.23*
	Rent	459	3.88	1.09	

Source: Urban Water Values Phase II Onsite Survey
Survey question: When it comes to water, to what extent do you trust or distrust the following sources of information?
[a]Based on survey question: do you own or rent your current residents?
[b]Items measured on a five-point scale from strongly distrust (1) to strongly trust (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Table K12. Differences between race and ethnicity subgroups in their trust in information sources.

Survey Item	Race[a]	N	Mean[b]	SD	F
My local or city government	White	328	3.79[x]	1.042	17.43*
	Hispanic, Latino, or Spanish heritage	80	3.45[x]	1.042	
	Black or African American	186	3.08[y]	1.342	
	Asian	176	3.68[x]	0.999	
	American Indian or Alaska Native	50	2.84[y]	1.267	
My county government	White	326	3.72[x]	1.092	14.25*
	Hispanic, Latino, or Spanish heritage	82	3.46[x]	1.157	
	Black or African American	183	3.03[y]	1.400	
	Asian	178	3.64[x]	1.000	
	American Indian or Alaska Native	48	2.90[y]	1.242	
My local environmental agencies (e.g., conservation districts or watershed management organizations)	White	328	4.34[x]	0.830	27.23*
	Hispanic, Latino, or Spanish heritage	83	3.93[y]	0.894	
	Black or African American	192	3.49[z]	1.274	
	Asian	176	3.88[y]	0.902	
	American Indian or Alaska Native	50	3.34[z]	1.272	
Regional government (e.g., Metropolitan Council	White	327	3.75[x]	1.015	13.06*
	Hispanic, Latino, or Spanish heritage	81	3.72[x]	0.965	
	Black or African American	184	3.15[y]	1.226	
	Asian	176	3.69[x]	0.899	
	American Indian or Alaska Native	48	3.13[y]	1.104	
Minnesota state agencies (e.g., Pollution Control Agency, Dept of Natural Resources, Dept of Health)	White	327	4.11[x]	0.980	19.31*
	Hispanic, Latino, or Spanish heritage	83	3.82[xy]	0.872	
	Black or African American	184	3.32[z]	1.314	
	Asian	178	3.83[y]	0.892	
	American Indian or Alaska Native	50	3.30[z]	1.233	
Federal government	White	325	3.29[xz]	1.202	7.95*
	Hispanic, Latino, or Spanish heritage	79	3.47[xz]	1.186	
	Black or African American	182	3.05[xz]	1.327	
	Asian	175	3.53[x]	0.927	
	American Indian or Alaska Native	48	2.63[yz]	1.178	
Tribal government	White	319	3.86[xy]	0.890	10.04*
	Hispanic, Latino, or Spanish heritage	80	3.68[xy]	0.868	
	Black or African American	181	3.30[z]	1.224	
	Asian	173	3.54[yz]	0.879	
	American Indian or Alaska Native	50	3.64[xyz]	1.025	
Universities and other academic institutions	White	327	4.37[xy]	0.764	33.13*
	Hispanic, Latino, or Spanish heritage	80	4.19[xy]	0.731	
	Black or African American	182	3.45[z]	1.201	
	Asian	178	3.89[yw]	0.869	

	American Indian or Alaska Native	48	3.73^{zw}	0.939	
Environmental organizations	White	328	4.41^{xy}	0.720	31.81*
	Hispanic, Latino, or Spanish heritage	83	4.16^{xy}	0.904	
	Black or African American	184	3.51^{z}	1.197	
	Asian	176	3.88^{yw}	0.905	
	American Indian or Alaska Native	47	3.72^{zw}	1.097	
Media (e.g., newspaper, tv, internet, and social media)	White	328	3.01^{x}	1.045	4.96*
	Hispanic, Latino, or Spanish heritage	81	3.42^{y}	1.160	
	Black or African American	184	2.96^{x}	1.254	
	Asian	178	3.25^{xy}	0.942	
	American Indian or Alaska Native	49	2.78^{x}	1.006	

Source: Urban Water Values Phase II Onsite Survey
Survey question: When it comes to water, to what extent do you trust or distrust the following sources of information?
F = statistic in Analysis of Variance (ANOVA) to assess statistically significant differences among race/ethnicity groups
[a]Based on an aggregate of survey question: which category best describes you?
[b]Responses based on a 5-point scale from strongly distrust (1) to strongly trust (5); SD=Standard deviation; Means with different superscripts are statistically different at the 0.05 level; means with same superscripts are not statistically different.
*Statistically significant differences at $p<0.01$

Table K13. Differences between White and BIPOC respondents in water values and uses

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
Drinking water that is safe and clean	White	327	4.88	0.33	9.28*
	BIPOC	705	4.52	0.98	
Equitable access to public waters for all Minnesotans	White	327	4.79	0.47	6.78*
	BIPOC	695	4.52	0.82	
Anglers to be able to fish for preferred species	White	326	3.25	1.32	-6.12*
	BIPOC	687	3.78	1.26	
Future generations	White	328	4.88	0.37	8.11*
	BIPOC	685	4.58	0.84	
High quality recreation opportunities for my or my family's use	White	328	3.91	1.06	-4.43*
	BIPOC	690	4.22	1.02	
Habitat for native fish and wildlife to survive	White	323	4.82	0.45	7.96*
	BIPOC	701	4.49	0.85	
Consistent water supply for watering lawns and landscaping around my neighborhood	White	326	2.78	1.47	-10.19*
	BIPOC	695	3.76	1.34	
Avoid costly water treatment expenses	White	325	3.70	1.13	-5.08*
	BIPOC	687	4.08	1.10	
Natural systems and processes are sustained	White	325	4.69	0.58	6.33*
	BIPOC	688	4.39	0.89	
Minnesota not to send water pollution downstream to other states or nations	White	326	4.67	0.67	4.40*
	BIPOC	689	4.45	0.87	
Equitable access to clean drinking water	White	326	4.85	0.39	7.56*
	BIPOC	701	4.56	0.84	
Consistent water supply for watering vegetable gardens	White	328	3.90	1.03	-5.03*
	BIPOC	691	4.24	0.98	
For cultural or religious practices	White	328	3.74	1.26	-4.62*
	BIPOC	693	4.11	1.06	
Consistent water supply to water-dependent industries like energy production and agriculture.	White	326	3.72	1.12	-5.05*
	BIPOC	688	4.09	1.08	

Source: Urban Water Values Phase II Onsite Survey
Survey question: How important to you is it to protect lakes and rivers for the following water values and uses?
[a]Based on an aggregate of survey question: which category best describes you?
[b]Items measured on a five-point scale from not at all important (1) to extremely important (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Table K14. Differences between young and old respondents in water values and uses

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
Drinking water that is safe and clean	Young	503	4.71	0.73	2.90*
	Old	529	4.56	0.87	
Future generations	Young	498	4.76	0.61	3.39*
	Old	515	4.60	0.83	
Equitable access to clean drinking water	Young	500	4.74	0.62	3.74*
	Old	527	4.57	0.84	

Source: Urban Water Values Phase II Onsite Survey
Survey question: How important to you is it to protect lakes and rivers for the following water values and uses?
[a]Based on an aggregate of survey question; in what year were you born; split at the median value of 36 years old
[b]Items measured on a five-point scale from not at all important (1) to extremely important (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Table K15. Differences between homeowners and renters in water values and uses

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
Drinking water that is safe and clean	Own	474	4.77	0.59	4.87*
	Rent	477	4.52	0.93	
Equitable access to public waters for all Minnesotans	Own	473	4.70	0.63	3.62*
	Rent	468	4.53	0.82	
Future generations	Own	472	4.75	0.64	2.99*
	Rent	464	4.61	0.81	
Habitat for native fish and wildlife to survive	Own	473	4.68	0.65	3.01*
	Rent	474	4.54	0.84	
Equitable access to clean drinking water	Own	476	4.75	0.63	3.47*
	Rent	471	4.58	0.80	

Source: Urban Water Values Phase II Onsite Survey
Survey question: How important to you is it to protect lakes and rivers for the following water values and uses?
[a]Based on survey question: do you own or rent your current residence?
[b]Items measured on a five-point scale from not at all important (1) to extremely important (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Table K16. Differences between female and male identifying respondents in water values and uses

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
Habitat for native fish and wildlife to survive	Female	559	4.67	0.67	2.83*
	Male	370	4.52	0.80	
Natural systems and processes are sustained	Female	556	4.56	0.74	2.98*
	Male	364	4.39	0.88	
Minnesota not to send water pollution downstream to other states or nations	Female	557	4.59	0.76	3.14*
	Male	365	4.42	0.86	
Equitable access to clean drinking water	Female	558	4.73	0.63	3.24*
	Male	373	4.57	0.82	

Source: Urban Water Values Phase II Onsite Survey
Survey question: How important to you is it to protect lakes and rivers for the following water values and uses?
[a]Based on survey question: to which gender identity do you most identify?
[b]Items measured on a five-point scale from not at all important (1) to extremely important (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Table K17. Differences between race and ethnicity subgroups in their water values and uses.

Survey Item	Race[a]	N	Mean[b]	SD	F
Drinking water that is safe and clean	White	327	4.88^{x}	0.330	17.77*
	Hispanic, Latino, or Spanish heritage	84	4.65^{xy}	0.736	
	Black or African American	190	4.35^{z}	1.062	
	Asian	178	4.67^{y}	0.653	
	American Indian or Alaska Native	50	4.68^{xy}	0.819	
Equitable access to public waters for all Minnesotans	White	327	4.79^{xy}	0.469	11.20*
	Hispanic, Latino, or Spanish heritage	82	4.71^{xy}	0.509	
	Black or African American	187	4.42^{z}	0.878	
	Asian	178	4.61^{y}	0.639	
	American Indian or Alaska Native	50	4.46^{yz}	0.885	
Anglers to be able to fish for preferred species	White	326	3.25^{x}	1.315	14.70*
	Hispanic, Latino, or Spanish heritage	82	3.88^{y}	1.309	
	Black or African American	183	3.96^{y}	1.150	
	Asian	177	3.93^{y}	1.158	
	American Indian or Alaska Native	50	3.84^{y}	1.251	
Future generations	White	328	4.88^{x}	0.365	15.75*
	Hispanic, Latino, or Spanish heritage	81	4.73 ^{xy}	0.570	
	Black or African American	181	4.43^{w}	0.978	
	Asian	178	4.68^{yz}	0.623	
	American Indian or Alaska Native	49	4.82 ^{xz}	0.565	
High quality recreation opportunities for my or my family's use	White	328	3.91^{x}	1.055	8.28*
	Hispanic, Latino, or Spanish heritage	84	4.40^{y}	0.933	
	Black or African American	185	4.21^{y}	1.075	
	Asian	178	4.36^{y}	0.854	
	American Indian or Alaska Native	49	4.18^{xy}	1.034	
Habitat for native fish and wildlife to survive	White	323	4.82^{x}	0.453	15.89*
	Hispanic, Latino, or Spanish heritage	82	4.70^{xy}	0.560	
	Black or African American	192	4.34^{z}	0.974	
	Asian	177	4.54^{y}	0.691	
	American Indian or Alaska Native	50	4.74^{xy}	0.664	
Consistent water supply for watering lawns and landscaping around my neighborhood	White	326	2.78^{x}	1.472	41.42*
	Hispanic, Latino, or Spanish heritage	82	3.83^{y}	1.359	
	Black or African American	186	4.05^{y}	1.128	
	Asian	178	4.04^{y}	1.183	
	American Indian or Alaska Native	50	3.66^{y}	1.409	
Avoid costly water treatment expenses	White	325	3.70^{x}	1.126	9.15*
	Hispanic, Latino, or Spanish heritage	83	4.22^{y}	1.037	
	Black or African American	182	4.13^{y}	1.084	
	Asian	177	4.18^{y}	1.027	

	American Indian or Alaska Native	50	4.10^{xy}	0.995	
Natural systems and processes are sustained	White	325	4.69^{x}	0.582	8.38*
	Hispanic, Latino, or Spanish heritage	84	4.51^{xy}	0.784	
	Black or African American	183	4.32^{y}	0.925	
	Asian	178	4.42^{y}	0.793	
	American Indian or Alaska Native	49	4.55^{xy}	0.792	
Minnesota not to send water pollution downstream to other states or nations	White	326	4.67^{xy}	0.670	4.73*
	Hispanic, Latino, or Spanish heritage	84	4.63^{xy}	0.617	
	Black or African American	183	4.39^{y}	0.901	
	Asian	177	4.47^{y}	0.798	
	American Indian or Alaska Native	50	4.56^{xy}	0.787	
Equitable access to clean drinking water	White	326	4.85^{x}	0.388	12.33*
	Hispanic, Latino, or Spanish heritage	84	4.67^{xyz}	0.717	
	Black or African American	191	4.43^{yz}	0.975	
	Asian	178	4.67^{y}	0.617	
	American Indian or Alaska Native	50	4.74^{x}	0.723	
Consistent water supply for watering vegetable gardens	White	328	3.90^{xy}	1.028	9.21*
	Hispanic, Latino, or Spanish heritage	82	4.22^{xyz}	1.054	
	Black or African American	183	4.28^{yz}	0.976	
	Asian	178	4.37^{yz}	0.808	
	American Indian or Alaska Native	50	4.34^{yz}	0.961	
For cultural or religious practices	White	328	3.74^{x}	1.257	9.19*
	Hispanic, Latino, or Spanish heritage	83	4.00^{xy}	1.048	
	Black or African American	185	4.22^{y}	1.011	
	Asian	178	4.23^{y}	0.961	
	American Indian or Alaska Native	50	4.34^{y}	1.081	
Consistent water supply to water-dependent industries like energy production and agriculture.	White	326	3.72^{x}	1.115	10.60*
	Hispanic, Latino, or Spanish heritage	85	4.16^{y}	1.163	
	Black or African American	184	4.15^{y}	1.065	
	Asian	173	4.29^{y}	0.820	
	American Indian or Alaska Native	50	4.00^{xy}	1.107	

Source: Urban Water Values Phase II Onsite Survey
Survey question: How important to you is it to protect lakes and rivers for the following water values and uses?
[a]Based on an aggregate of survey question: which category best describes you?
F = statistic in Analysis of Variance (ANOVA) to assess statistically significant differences among race/ethnicity groups
[b]Responses based on a 5-point scale from not at all important (1) to extremely important (5); SD=Standard deviation; Means with different superscripts are statistically different at the 0.05 level; means with same superscripts are not statistically different.
*Statistically significant differences at p<0.01

Table K18. Differences between White and BIPOC respondents in intention to engage in water actions in the next 12 months.

Survey item	Subgroup[a]	N	Mean[b]	SD	t[c]
Volunteer for a community organization or a water protection event.	White-Only BIPOC	328 701	2.98 3.24	1.09 1.12	-3.52*
Work with other community members to protect water in my community.	White-Only BIPOC	326 687	3.21 3.50	1.06 1.08	-4.05*
Attend meetings or public hearings about water.	White-Only BIPOC	328 686	3.06 3.43	1.08 1.08	-5.14*

Source: Urban Water Values Phase II Onsite Survey
Survey question: How likely are you to take the following water protection actions in the next 12 months?
[a]Based on an aggregate of survey question: which category best describes you?
[b]Items measured on a five-point scale from most certainly not (1) to most certainly will (5)
[c]T-test statistic for testing differences in means; *significance level of $p \leq 0.01$; only items with statistical differences reported here
SD = Standard deviation

Appendix L. Photos taken at onsite survey events

Photo by Meredith Keller

Photo by Meredith Keller

Photo by Phil Deering

Photo by Meredith Keller

Photo by Meredith Keller

Appendix M – Onsite Survey Fact Sheet

Urban Water Values in the Twin Cities Metro Area

Findings from community-centered research

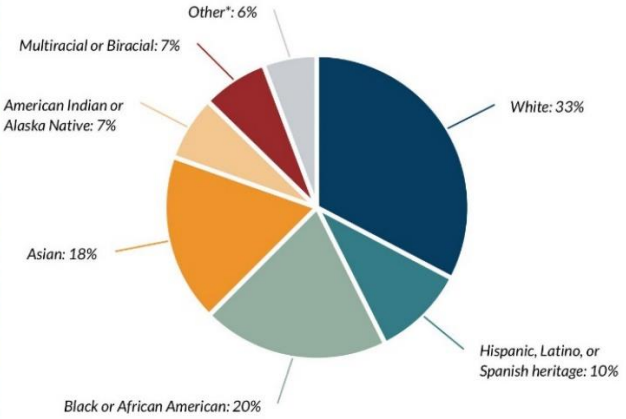
One central goal of this research is to understand and uplift marginalized voices and communities that often are under-represented in water science, policy, and management. In this project, researchers from the University of Minnesota's Center for Changing Landscapes in collaboration with the Metropolitan Council and community partners administered onsite surveys at 14 community events across the Minneapolis-St. Paul Metropolitan Area (MSP) in 2023 to better understand water relationships in socially and culturally diverse communities.

Inclusive research methods

Exploring water relationships in urban areas requires a critical examination of the marginalization of residents and communities across socio-cultural variables such as income, race, and ethnicity. In the 7-county MSP, historical and systemic institutional racism has had cascading social, cultural, and ecological consequences that are still evident and felt today (Davenport et al. 2023, Walker et al. 2023). Water science, policy, and management has the potential to acknowledge and address disparities by centering communities and prioritizing inclusion and representation of socially and culturally diverse voices. Social science research supports representation justice in water policy and management by engaging community members in culturally meaningful ways across diverse water relationships and experiences.

Our team's approach applies multiple participatory research methods to gather water narratives, including this survey of MSP residents' water values, beliefs, concerns, and actions. In this study, we aimed to engage and represent voices of residents who identify as Black, Indigenous, or People of Color (BIPOC) through inclusive research designs. By meeting residents face-to-face in their own communities, hiring multi-lingual field staff, and providing a small cash incentive for participants, our study engaged 1,052 community members, 67% who identify as BIPOC, and documented diverse water relationships.

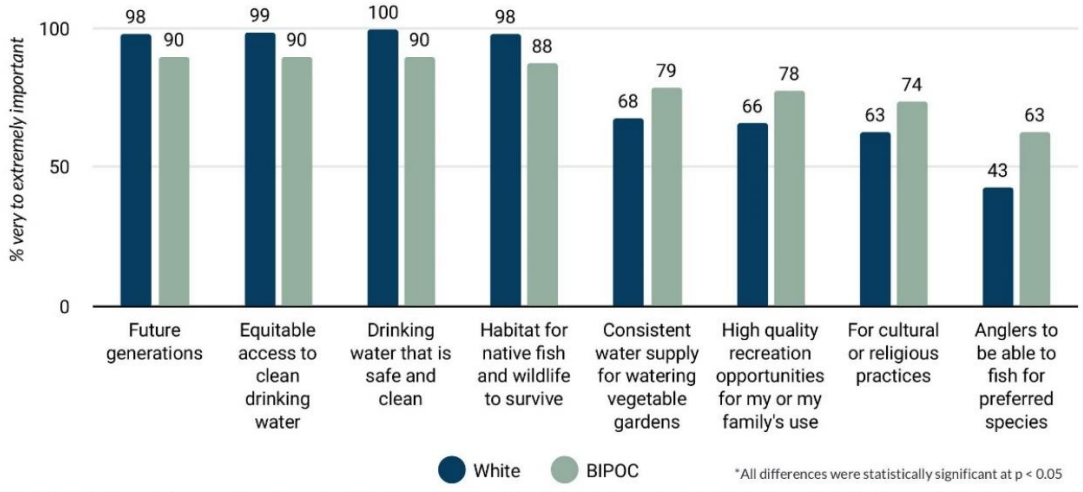
Racial and ethnic identities of survey respondents



*remaining 6% comprised of Middle Eastern or North African, Native Hawaiian or other Pacific Islander, or a race, ethnicity or heritage not listed here

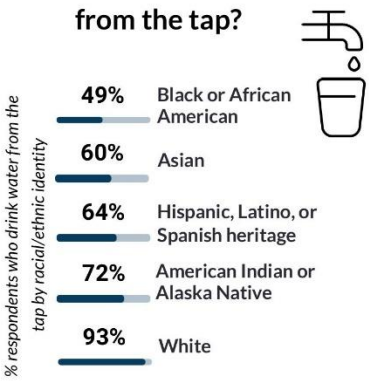
How do MSP residents value water?

*How important to you is it to protect lakes and rivers for the following water values or uses?**

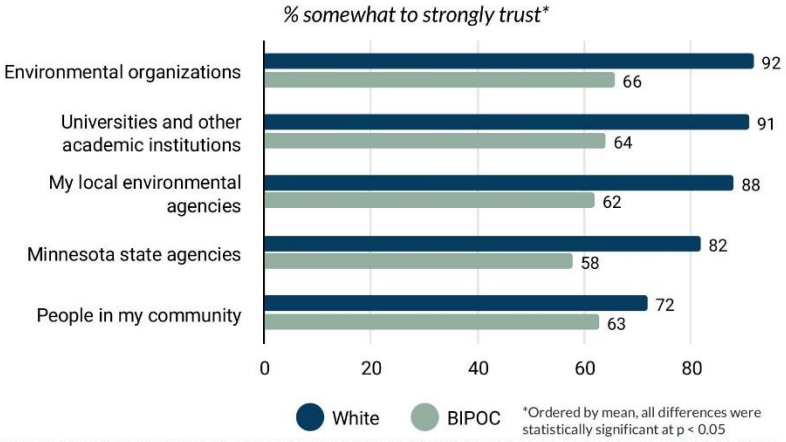


*All differences were statistically significant at $p < 0.05$

Who drinks water from the tap?



Who do MSP residents trust for information about water?



Disparities in water access

49% of BIPOC respondents trust that their tap water is safe to drink (compared to 77% of White respondents)

46% of BIPOC respondents worry about the safety of their drinking water (compared to 19% of White respondents)

75% of BIPOC respondents have reliable access to drinking water (compared to 93% of White respondents)

56% of BIPOC respondents are concerned about adequate water supply at home (compared to 41% of White respondents)

Lessons Learned

Water relationships vary significantly across social and cultural groups in MSP

This awareness and understanding should guide all water planning and projects, including water restoration, protection, and stewardship.

Research methods matter

Community-centered research yields more representative samples and produces more inclusive research findings.

Access to drinking water is an environmental justice issue

Accessing and trusting clean and safe drinking water is more complicated, costly, and challenging overall for Black residents, Indigenous residents, and other residents of color living in MSP than it is for White residents.

Solving the water crisis...

is less about helping communities understand water and more about helping water professionals understand communities and how to work in partnership with communities in ways that acknowledge, include, and represent diverse water relationships, experiences, and values.

Acknowledgements

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For more information about this study contact Mae Davenport at mdaven@umn.edu or 612-624-2721.

Center for Changing Landscapes, University of Minnesota Driven to Discover℠ | Metropolitan Council | Water Resources Center, University of Minnesota Driven to Discover℠ | Clean Water Land & Legacy Amendment

Appendix N - Workshop 1 & 2 Agenda

Equitable Water Policy Development Workshop Agenda
April 26, 2024, 9:30 - 11:30 am
Mississippi Watershed Management Organization

Workshop Objectives: (1) reflect upon recent survey findings related to water equity; and (2) co-create potential policy actions to better address equity concerns in water management in the Twin Cities.

Agenda:

1. *Welcome* (15 minutes)
   - Introduction, Agenda, Roles
   - **Ice Breaker:** Tell us your name, the organization you are representing today, and briefly what the words "water equity" mean to you.

2. *Survey interpretation* (35 minutes)

3. *Break* (5 minutes)

4. *ORCA discussion* (20 minutes)
   - Observe
   - Reflect
   - Contemplate
   - Act

5. *Policy development discussion* (30 minutes)
   - Goal
   - Expected practices or behaviors
   - Processes to achieve it

6. *Share out and closing discussion* (10 minutes)

Reminder:
Workshop #2 on Monday May 13th, 1:00 - 3:00 pm
Rondo Library in St. Paul (461 Dale Street N)

Appendix O - Policy Co-Development Worksheet

Policy Development Worksheet

Definition: a written or unwritten principle intended to attain a goal
Components:

- A clear goal
- Expected practices or behaviors
- Processes for how to achieve it

Goal #1:

Expected practice / behavior 1:

Expected practice / behavior 2:

Expected practice / behavior 3:

Potential processes:

Policy #1:

Goal #2:

Expected practice / behavior 1:

Expected practice / behavior 2:

Expected practice / behavior 3:

Potential processes:

Policy #2:

Goal #3:

Expected practice / behavior 1:

Expected practice / behavior 2:

Expected practice / behavior 3:

Potential processes:

Policy #3:

Appendix P - Workshop 3 Agenda

Co-Developing Equitable Water Policy
Workshop #2 Agenda

May 13, 2024, 1:00 - 3:00 pm
Rondo Library, St. Paul

Workshop Objectives: (1) prioritize equitable water policy ideas and (2) co-develop action steps and implementation plan.

Agenda:

1. *Welcome & recap* (15 minutes)

2. *Policy prioritization - Parts I and II* (30 minutes)
   - Individual
   - Small group

3. *Group share out* (10 minutes)
   - Top 3 actions and why
   - 1 group discussion highlight

4. *Break* (5 minutes)

5. *Policy co-development - Part III* (30 minutes)
   - Action steps / Implementation

6. *Group share out and closing discussion* (25 minutes)
   - Action steps
   - Barriers
   - Opportunities
   - Next steps

Appendix Q - Equitable Water Policy Action Planning Worksheet

Water Equity Policy Co-Development Worksheet

Water Equity and Policy Workgroup #	
Member names:	
Instructions: Choose one policy idea to discuss and co-develop. Answer the questions below as a group and turn in one copy to the facilitators.	
Questions	**Responses**
What is the policy idea statement?	
What is the policy's primary goal?	
What new or different practices/behaviors (i.e., changes) are needed to achieve this goal?	
What are 3-5 specific action steps needed to achieve the policies goals?	
Action step 1.	
Action step 2.	
Action step 3.	
Action step 4.	
Action step 5.	
How do we implement or apply this policy?	

Water Equity Policy Co-Development Worksheet

Who are the policy actors (e.g., government, NGOs, social groups, communities, private businesses or corporatations)?	
What are their roles and responsibilities?	
Where and **when** will the policy have an impact (e.g., geographies, communities, timelines)?	
How will we learn and adapt as we go?	
What resources are needed (e.g., human, financial, infrastructure)	
What are **uncertainties** or potential **barriers** to success?	
Notes:	