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# Climate Adaptation Planning Survey

Minnesota Pollution Control Agency  
Interagency Climate Adaptation  
Team September 12, 2019

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# Executive summary

## Background

The Minnesota Pollution Control Agency (MPCA) leads and participates as a member of the Minnesota Interagency Climate Adaptation Team (ICAT). In 2015, ICAT identified a set of five statewide indicators to help track progress toward achieving a resilient, economically thriving, and healthy Minnesota that is prepared for both short- and long-term climate changes and weather extremes. To measure one of the indicators, MPCA asked Management Analysis and Development (MAD) to develop, administer, and analyze an online survey of Minnesota cities, counties, watershed districts, soil and water conservation districts, tribal governments, and relevant state agencies. MAD completed the first survey in 2016 and replicated the effort in 2019 to measure progress.

MAD worked with experts from MPCA to update the survey and conduct analyses that will be useful to ICAT.

The primary purposes of the survey were:

- Estimate the percentage of governmental agencies in Minnesota that have climate adaptation planning efforts, to serve as an ICAT indicator.
- Learn more about climate adaptation and resilience planning efforts by governmental organizations in Minnesota.
- Learn about the climate adaptation actions being taken by governmental organizations in Minnesota.
- Gain information about what types of resources might be useful to governmental organizations engaged in climate adaptation and resilience planning in Minnesota.

Additionally, MPCA hoped that the survey introduction email and the survey itself would increase general awareness of climate adaptation and resilience issues among survey recipients.

## Key findings

This is the second statewide survey of climate adaptation and resilience planning in Minnesota. More than one thousand Minnesota cities, counties, tribal governments, watershed districts, soil and water conservation districts, and key state agencies received the survey, with about 33 percent responding (358 of 1,088). Though the responding organizations may not be completely reflective of the state as a whole, the data from the survey can provide useful information to ICAT.

## Statewide indicator

A realistic indicator of statewide planning efforts can be calculated using survey data: 24.5 percent of organizations invited to participate in the survey (a better indicator than organizations that took the survey)

report that they have at least one type of plan or planning effort with content that specifically addresses climate adaptation and resilience. This is an increase from 17.5 percent in 2016.

**Figure 1: Statewide indicator of climate adaptation and resilience**



## Respondents' planning and actions

Responding governmental organizations are engaged in a wide range of planning efforts. Three-quarters of responding organizations have one or more plans or are engaged in planning efforts that specifically address climate adaptation and resilience in some way. A much larger percentage of the responding governmental organizations report being engaged in planning that addresses climate adaptation and resilience in the 2019 survey (75 percent) than in the 2016 survey (57 percent).

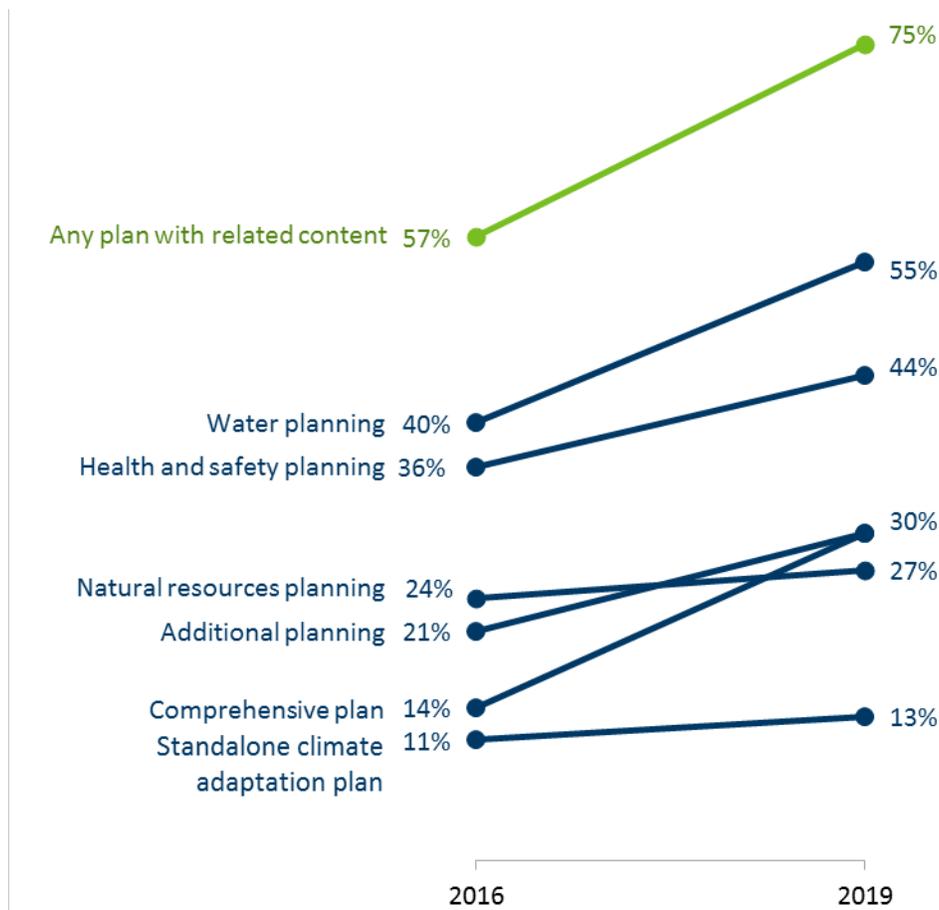
On average, organizations selected 4.6 of the 38 planning options listed. Relatively few are engaged in many different types of plans or planning efforts related to climate adaptation and resilience. Although the 2019 average was only 4.6 items, it is still an increase of more than one plan, up from an average of 3.3 in 2016.

As shown in Figure 2, specific survey results regarding planning include:

- More than half of responding organizations are engaged in water plans or planning efforts with climate adaptation and resilience content. This increased from 40 percent in 2016.
- Nearly 45 percent of responding organizations indicated that they are engaged in health and safety planning efforts that include content on climate adaptation and resilience. This increased from 36 percent in 2016.
- Almost one-third of respondents have engaged in comprehensive planning efforts that include content on climate adaptation and resilience. This increased from 14 percent in 2016.

- Almost one-third of respondents indicated that they are engaged in some additional type of planning effort that includes climate adaptation and resilience. This increased from 21 percent in 2016.
- Relatively few responding organizations are engaged in standalone climate adaptation planning efforts.
- Within each question about broad types of planning (standalone, health and safety, natural resources, etc.), with multiple options for answers, the most common response was “none of the above.”

**Figure 2: Trends in types of planning**



When asked about actions their organizations have taken in the past three years to increase resilience in their community or environment, 65 percent of respondents selected at least one listed action. Most often respondents said their organizations have planted more community trees and/or more resilient tree species (35 percent). Nearly as many said they had increased the community’s walkability, bikability, public gathering spaces, or pedestrian safety (34 percent).

## Resources and assistance needed

Responding organizations provided input on the types of resources or assistance that would be helpful to their organization for climate adaptation and resilience planning. More than half of respondents (54 percent) chose “financial assistance.” While 64 percent of respondents in 2016 selected “best practices for climate adaptation and resilience,” only 46 percent of respondents made the same choice in 2019. “Model policies or ordinances”

(45 percent) and “planning toolkit and guides” (44 percent) remained near the top of the list in 2019. “Local (downscaled) climate change projection data,” added as an option in the 2019 survey, was selected by 38 percent of respondents.

## Experience with events or trends associated with the changing climate

Respondents were asked to select from a list of events or trends associated with the changing climate that have affected their organization or community in the past few years. Overall, the vast majority of respondents selected at least one option (87 percent). Most often respondents selected extreme rainfall events (65 percent), which is down slightly from 74 percent in 2016. “High winds following heavy precipitation event(s)” was a new choice in 2019. It became the second most popular option, with 38 percent of respondents selecting it.

Organizations that experienced one or more climate-related events or trends far more frequently identified plans or planning activities than those organizations that did not.

## Recommendations for future surveys

MAD’s role in this project was survey development, administration, and analysis, with the expectation that ICAT will identify implications from the survey data and develop next steps. Advice on survey issues may be useful, however, so MAD offers the following recommendations for future surveys.

**Continue with planned survey timing:** MAD continues to recommend that ICAT conduct the survey on a roughly two-to-three-year cycle. This will provide relatively up-to-date information for measuring progress while simultaneously avoiding survey fatigue and allowing time for changes to take place. The 2019 results show that the prevalence of planning has changed since 2016.

**Add or expand on questions, but use restraint:** MAD recommends that the group consider adding or refining questions or topics to address certain issues (such as expansion of planning efforts or additional resource needs). Detailed recommendations are on page 28.

**Use the survey as an opportunity to educate:** On the question about resources and partnerships usage, only one-third of respondents indicated that they had used one of the listed options. The respondents that had not used the resources, and even some of those that had, may be curious about those resources. ICAT could include links to those programs in the survey to help agencies find existing resources.

**Use restraint on survey expansion:** Although there are benefits to adding questions and collecting additional information, MAD suggests that ICAT be cautious. Maintaining a brief survey with narrow scope will minimize the burden on respondents, and maintaining the survey’s focus on climate adaptation and resilience planning will make it easier to repeat the survey and have consistent data over time.

# Background and methodology

The Minnesota Pollution Control Agency (MPCA) leads and participates as a member of the Minnesota Interagency Climate Adaptation Team (ICAT). In 2015, ICAT developed a set of five statewide indicators to help track progress toward achieving a resilient, economically thriving, and healthy Minnesota that is prepared for both short- and long-term climate changes and weather extremes.

One of these five indicators focuses on climate adaptation planning by state agencies, local governments, and tribal governments. MPCA has the lead role in data collection for this indicator, and staff asked Management Analysis and Development (MAD) to develop, administer, and analyze an online survey of Minnesota cities, counties, watershed districts, soil and water conservation districts, tribal governments, and relevant state agencies. MAD completed the first survey in 2016 and replicated the effort in 2019 to measure progress.

In 2016, MAD worked with a team of experts from MPCA to design the survey and conduct analyses that would be useful to ICAT. In 2019, MAD again worked with MPCA to update the survey and identify additional analyses. A detailed description of survey methods is in Appendix A (page 30), and the full survey is in Appendix B (page 32).

The primary purposes of the survey were:

- Estimate the percentage of governmental agencies in Minnesota that have climate adaptation planning efforts, to serve as an ICAT indicator.
- Learn more about climate adaptation and resilience planning efforts by governmental organizations in Minnesota.
- Learn about the climate adaptation actions being taken by governmental organizations in Minnesota.
- Gain information about what types of resources might be useful to governmental organizations engaged in climate adaptation and resilience planning in Minnesota.

Additionally, MPCA hoped that the survey introduction email and the survey itself would increase general awareness of climate adaptation and resilience issues among survey recipients.

This report is organized so that the body of the report provides information relevant to the primary purposes of the survey. Appendices C–I provide more detailed survey results for categories of respondents.

## Response rate

Overall, 358 organizations responded to the survey, representing 33 percent of all survey recipients. Table 1 shows the response rates by type of organization and the proportion of all survey responses represented by each group. Cities, the largest group of survey recipients, had a 25 percent response rate but comprised 57 percent of all responses. (Cities comprised 62 percent of all responses in 2016). State agencies had the highest response rate of 83 percent but only comprised 7 percent of respondents.

The 2019 response rate was slightly better than the 30 percent response rate in 2016. Of the 358 responding organizations in 2019, 41 percent also participated in the 2016 survey.

**Table 1: Responses by organization type**

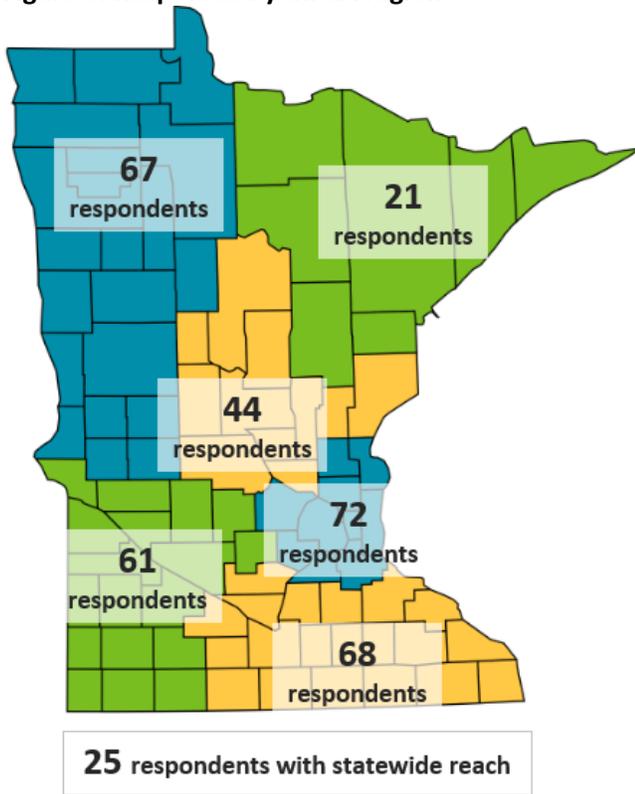
| Organization type                    | Responses | Response rate | Percent of survey responses |
|--------------------------------------|-----------|---------------|-----------------------------|
| City                                 | 205       | 25%           | 57%                         |
| Soil and water conservation district | 57        | 64%           | 16%                         |
| County                               | 34        | 40%           | 9%                          |
| Watershed district                   | 30        | 57%           | 8%                          |
| State agency                         | 25        | 83%           | 7%                          |
| Tribal government                    | 7         | 58%           | 2%                          |

Table 2, Figure 3, and Figure 4 show the response figures from each MPCA region of Minnesota. The northeast region made up only 6 percent of respondents, but it has fewer organizations than other regions; their regional response rate was similar to other regions'. This distribution of responses by region is largely similar to the 2016 survey results.

**Table 2: Responses by region**

| MPCA region       | Responses | Response rate | Percent of survey responses |
|-------------------|-----------|---------------|-----------------------------|
| Twin Cities Metro | 72        | 33%           | 20%                         |
| Southeast         | 68        | 32%           | 19%                         |
| Northwest         | 67        | 29%           | 19%                         |
| Southwest         | 61        | 31%           | 17%                         |
| Central           | 44        | 30%           | 12%                         |
| Statewide         | 25        | 81%           | 7%                          |
| Northeast         | 21        | 36%           | 6%                          |

**Figure 3: Responses by MPCA region**



**Figure 4: Response rate by MPCA region**

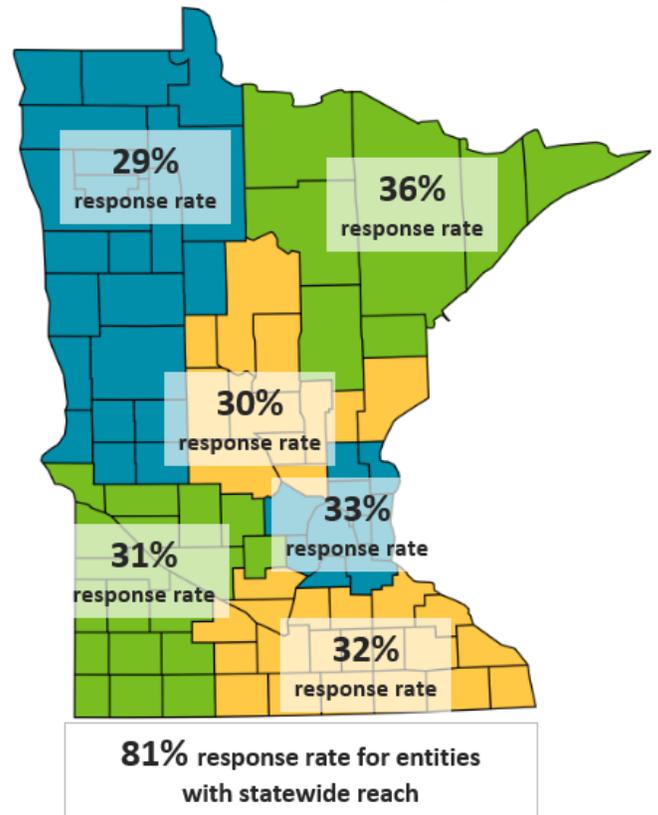


Table 3 shows the 2019 distribution of responses by size of organization based on number of employees, which closely aligns with the 2016 distribution. Most survey respondents continue to be relatively small organizations.

**Table 3: Responses by organization size (employees)**

| Org. size  | Responses | Percent of survey responses |
|------------|-----------|-----------------------------|
| 0–10       | 185       | 52%                         |
| 11–50      | 60        | 17%                         |
| 51–200     | 41        | 11%                         |
| 201–500    | 25        | 7%                          |
| 501–1,000  | 6         | 2%                          |
| over 1,000 | 17        | 5%                          |

# Statewide indicator of climate adaptation and resilience planning

A primary purpose of this survey was to measure the statewide indicator of government planning efforts related to climate adaptation and resilience. One option for this indicator would be to look solely at survey responses—the proportion of respondents that selected planning options, for example. It is necessary to put the survey results in context, however. The 33 percent response rate was good for a survey of this kind, but the organizations responding to the survey may not be reflective of all governmental organizations in Minnesota, so survey results alone would not be a realistic indicator of statewide planning efforts.<sup>1</sup>

A reasonable (and likely conservative) estimate of statewide planning efforts can be calculated by examining survey data in the context of all surveyed organizations. MAD took the total number of responding organizations that indicated they are engaged in any type of planning efforts with content specifically related to climate adaptation or resilience (267) and divided that by the total number of organizations invited to participate in the survey (1,088).<sup>2</sup> Using this calculation, 24.5 percent of organizations invited to take the survey report that they have at least one plan or planning effort with content that specifically addresses climate adaptation and resilience. This is an increase from the 2016 result of 17.5 percent and can serve as an indicator for evaluating progress in ICAT’s ongoing work to advance climate adaptation in Minnesota.

**Figure 5: Statewide indicator of climate adaptation and resilience**



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<sup>1</sup> Organizations that chose to complete the survey may be more interested or engaged in climate adaptation and resilience planning than governmental organizations in general, which could drive up the number of affirmative responses to survey questions. Conversely, since the survey typically was sent to a generic contact in city or county government, it is possible that the recipient was unfamiliar with existing planning efforts, which could mean the number of affirmative responses in the survey is not reflective of actual planning efforts.

<sup>2</sup> A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any response to questions in the survey about climate adaptation or resilience planning efforts. In a few cases, respondents were designated as being engaged in planning if they did not select a planning option from the listed options but described a specific relevant plan or planning effort in an open-ended response.

# Survey respondents' planning efforts

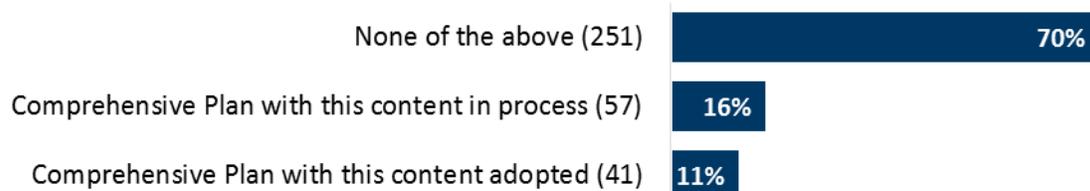
The sections below show the results of the survey by type of plan or planning effort. The survey asked respondents to review lists of types of plans and planning efforts, and to identify which of the plans or planning efforts their organization engaged in that included content specifically addressing climate adaptation and resilience.

The charts in the next sections show the proportion of responses for each detailed type of plan or planning activities. For many questions, totals may not equal 100 percent because respondents could select multiple options, or because not all respondents answered the question.

## Comprehensive planning

In 2019, 11 percent of respondents said they had adopted a comprehensive plan with content that specifically addresses climate adaptation and resilience, up from 3 percent in 2016. Additionally, 16 percent of respondents reported being in the process of developing a comprehensive plan with this content, as shown in Figure 6. The percent of respondents who said they did not have a comprehensive plan with climate adaptation and resilience content dropped to 70 percent from 86 percent in 2016.

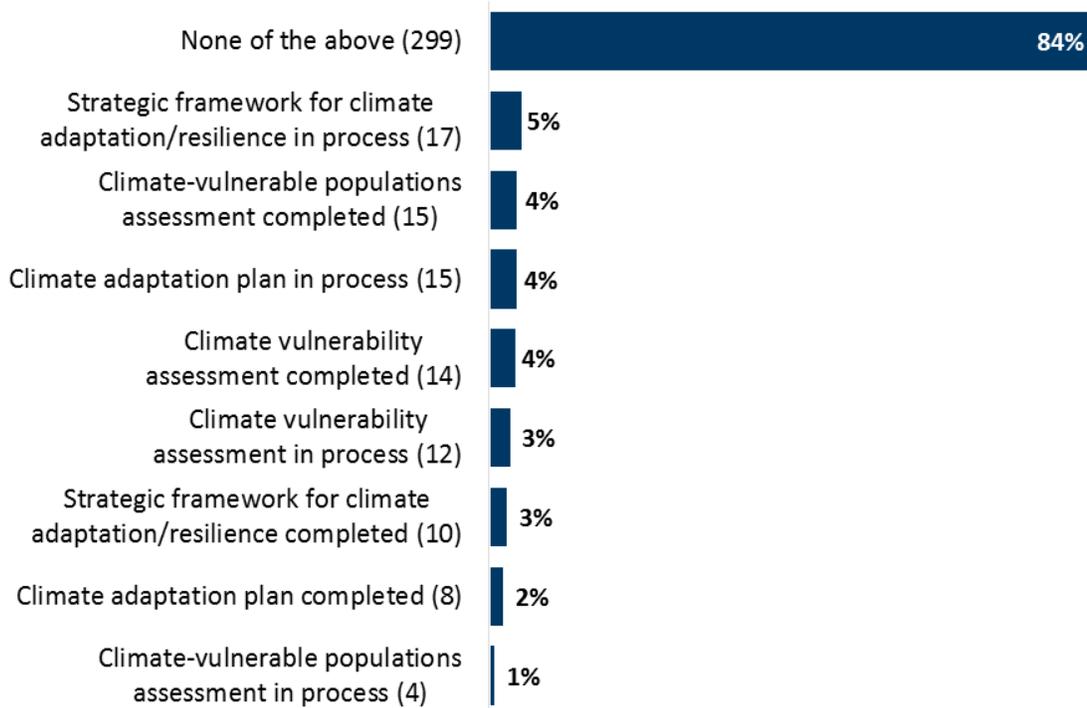
**Figure 6: Does your organization have a comprehensive plan with content that specifically addresses climate adaptation and resilience?**



## Standalone planning

In the 2019 survey, standalone planning efforts specifically to address climate adaptation and resilience still were not very common, but had increased among different types of plans. As shown in Figure 7, the percentage of respondents who said they had not engaged in any standalone planning efforts had dropped to 84 percent in 2019. This compares with 89 percent reporting no standalone planning efforts in 2016.

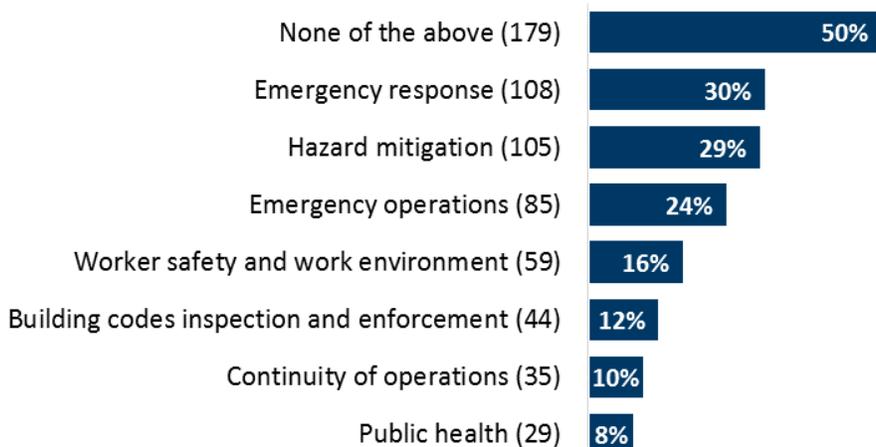
**Figure 7: Has your organization engaged in any of the following standalone planning efforts specifically to address climate adaptation and resilience? Please check all that apply.**



## Health and safety planning

In 2019, only 50 percent of respondents indicated that they did not have health and safety plans or planning efforts with content that specifically addresses climate adaptation and resilience. In 2016, 63 percent said they did not have these plans. Figure 8 shows that among health and safety plans, most often respondents chose emergency response plans (at 30 percent, up from 25 percent in 2016) and hazard mitigation plans (at 29 percent, up from 19 percent in 2016).

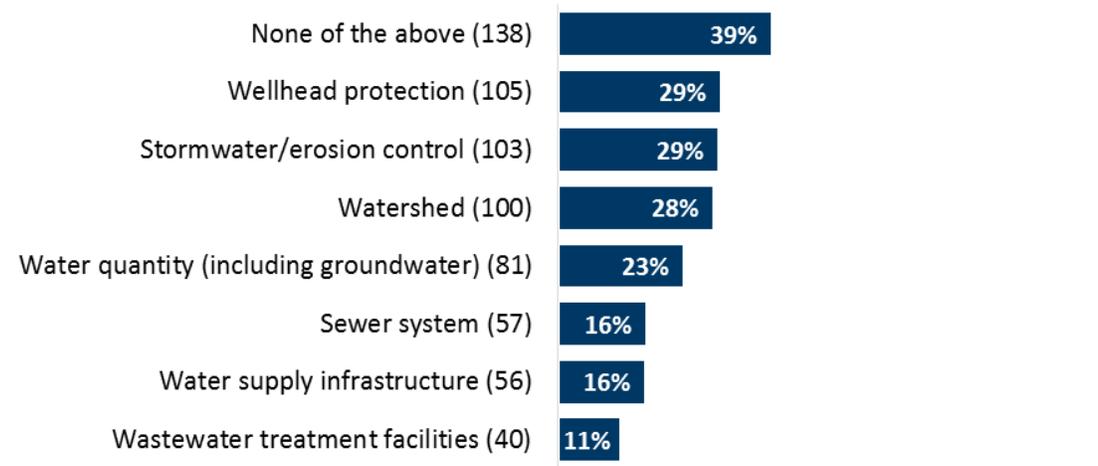
**Figure 8: Does your organization have any health and safety plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**



## Water planning

Compared with 2016 results, more organizations in 2019 said they have water plans with climate adaptation and resilience content. Only 39 percent chose “none of the above” in 2019 compared with 59 percent in 2019. The three most common types of plan stayed consistent from 2016 to 2019: stormwater (up to 29 percent from 22 percent), wellhead protection (up to 29 percent from 21 percent), and watershed (up to 28 percent from 21 percent). Figure 9 details the 2019 results.

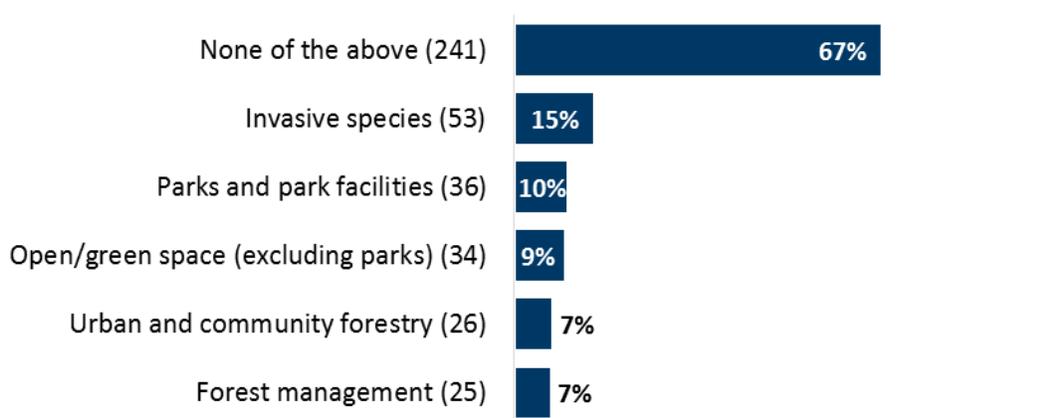
**Figure 9: Does your organization have any water plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**



## Natural resources planning

Compared with 2016, slightly more organizations have natural resources plans that specifically address climate adaptation and resilience. Invasive species planning and parks and facilities planning remained the most commonly selected options. The “none of the above” rate decreased from 76 percent to 67 percent between 2016 and 2019. Figure 10 details the 2019 results.

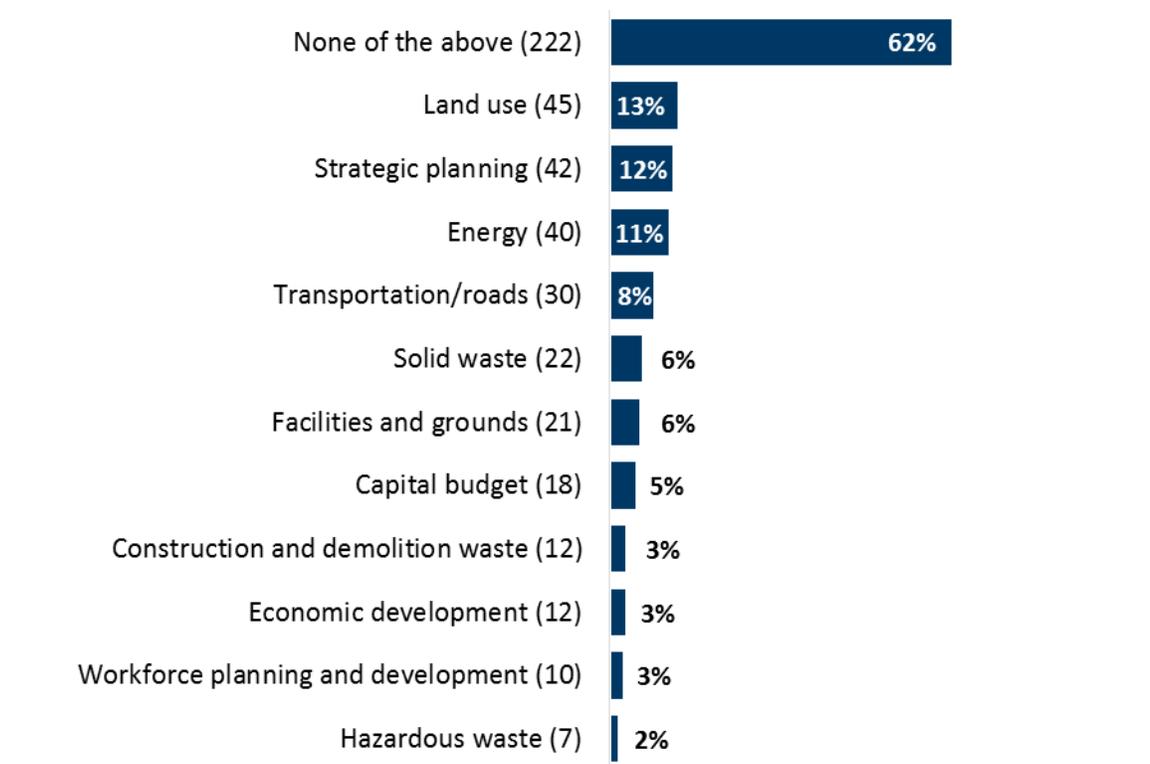
**Figure 10: Does your organization have any natural resources plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**



## Additional planning efforts

More organizations reported having engaged in specific types of additional planning efforts (not covered in previous categories) that specifically address climate adaptation and resilience. In 2019, 62 percent of respondents said they were not engaged in any of these types of additional planning, compared with 78 percent in 2016. In both years, strategic planning and land use were the most common selections for types of additional planning. The 2019 survey added a new option, Energy, and 11 percent of respondents said they have engaged in this type of planning. Figure 11 details the 2019 results.

**Figure 11: Has your organization engaged in any additional planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**



## Other types of planning

Another survey question asked respondents, “Has your organization engaged in any other planning with content specifically related to climate adaptation and resilience? Please provide a description below or click next.” About 15 percent of survey respondents offered some comments (excluding responses like “none” or “not applicable”). As in 2016, over half of the 2019 commenters offered more detail about their planning efforts or explained why their organization had not taken additional action.

About one-quarter of the comments described relevant actions their organization had taken that did not involve planning. Among other things, they said their organizations:

- Adopted energy codes.
- Offered resilience workshops.
- Had their staff attend relevant workshops and conferences.
- Changed landscaping to native grasses.
- Changed shorelines to better withstand storms.

Most of the remaining comments described additional types of planning that involved climate adaptation and resilience content. Among other topics, they mentioned:

- Pedestrian and bicycle master plans.
- Flood plans.
- Resource management plans
- Sustainability plans.

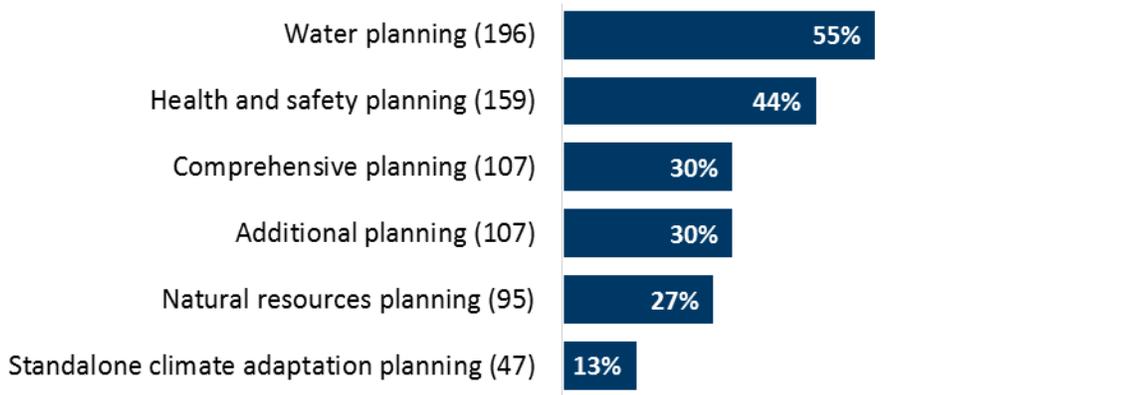
## **A broader view of planning efforts**

### **Planning efforts by type of plan**

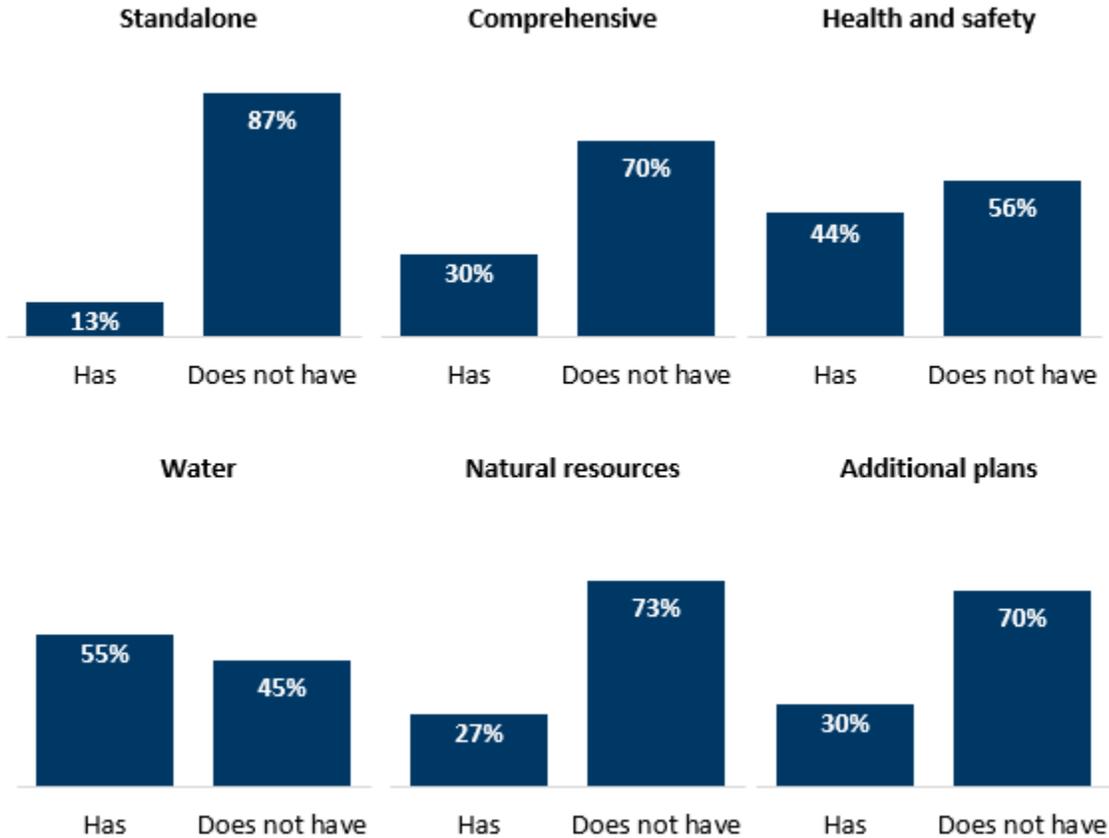
Reviewing survey results by type of plan can provide a broader view of the survey respondents' planning efforts. For the first time, a category passed the 50 percent threshold. Figure 12 and Figure 13 below provides an overview of planning efforts by type of plan:

- More than half of responding organizations are engaged in water plans or planning efforts with climate adaptation and resilience content.
- Health and safety planning efforts that include content on climate adaptation and resilience was the second most common among responding organizations.
- The percentage of respondents that have engaged in comprehensive planning efforts that include content on climate adaptation and resilience more than doubled from 2016.
- Relatively few responding organizations are engaged in standalone climate adaptation planning efforts.

**Figure 12: Climate adaptation or resilience content in planning efforts by type of plan – unified<sup>3</sup>**



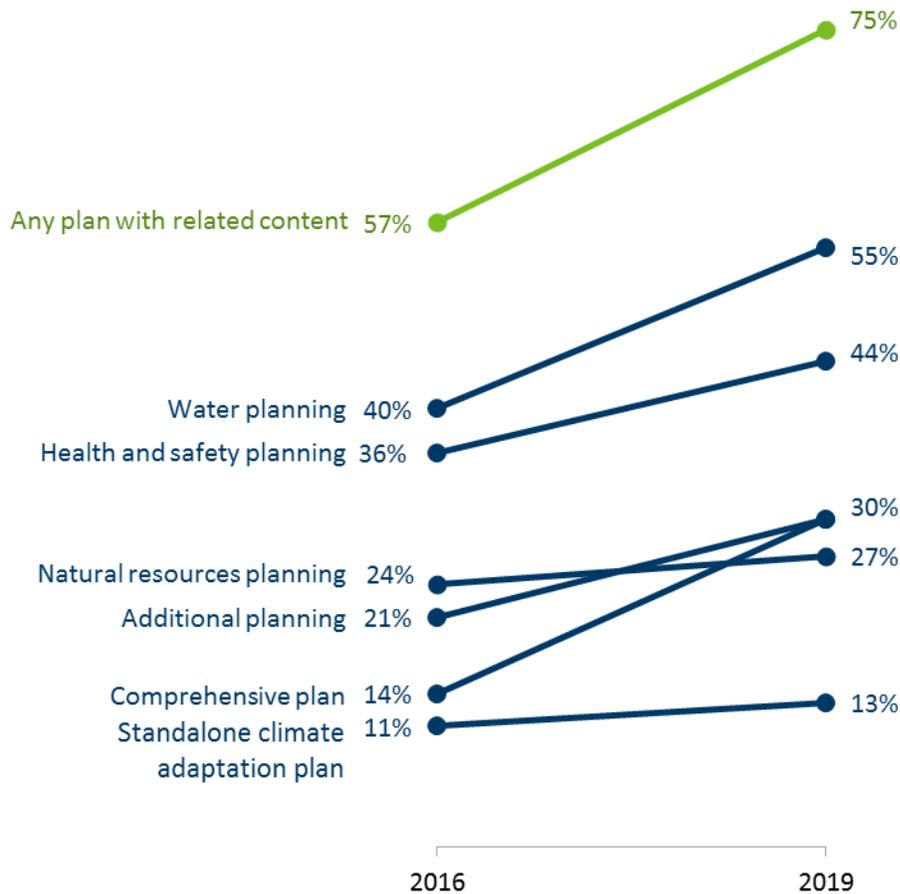
**Figure 13: Climate adaptation or resilience content in planning efforts by type of plan – split**



<sup>3</sup> The values in Figures 12 and 13 are calculated by designating a respondent as “has” for a type of plan if they selected any option under the broad question about that type of plan. These totals when compared with previous tables may not add up to 100 percent because respondents may select more than one answer and some respondents did not provide any answer. To review the detailed survey questions for each type of plan, see the preceding section.

Figure 14 shows how the prevalence of these planning types changed between the 2016 and 2019 surveys. The percent of every plan type increased at least somewhat between the two surveys. The percent of organizations with any plan with related content increased the most, to 75 percent (267 respondents) from 57 percent (189 respondents).<sup>4</sup> Natural resources planning and standalone climate adaptation plans increased the least.

**Figure 14: Trends in types of planning**



## Extent of planning efforts

Another data point provides useful insights from the survey regarding planning efforts: the average number of planning activities for individual organizations.

Respondents could choose from a maximum of 38 options related to planning. The highest number anyone chose was 22, and the lowest was 0. On average, respondents selected 4.6 items. This is an increase from an

<sup>4</sup> A respondent who answered affirmatively to any planning option was designated as being engaged in relevant planning. Respondents were counted once, regardless of whether they selected one, two, or many of the specific planning efforts listed.

average of 3.3 in 2016.<sup>5</sup> The median number of planning efforts per organization was three. As shown in Table 4, larger organizations had a higher average and median number of plans. Small organizations of fewer than-10 employees averaged 4.0 plans, compared to 9.3 and 10.6, respectively, for organizations of 501-1,000 employees or over 1,000 employees.

**Table 4. Number of plans, by organization size**

| <b>Org. size</b> | <b>Average number of plans</b> | <b>Median number of plans</b> | <b>Number of responses</b> |
|------------------|--------------------------------|-------------------------------|----------------------------|
| 0-10             | 4.0                            | 2                             | 185                        |
| 11-50            | 4.4                            | 3                             | 60                         |
| 51-200           | 4.9                            | 4                             | 41                         |
| 201-500          | 6.7                            | 4                             | 25                         |
| 501-1,000        | 9.3                            | 9                             | 6                          |
| over 1,000       | 10.6                           | 9                             | 17                         |

The responses suggest a wide range of planning efforts among surveyed organizations. The vast majority of responding organizations have plans or are engaged in planning efforts that specifically address climate adaptation and resilience. Overall, relatively few governmental organizations in Minnesota are engaged in many different types of plans or planning efforts related to climate adaptation and resilience. There are many possible reasons and the design of the survey does not provide sufficient information to determine why. This could be a potential line of questioning to consider for future surveys.

## Other survey results

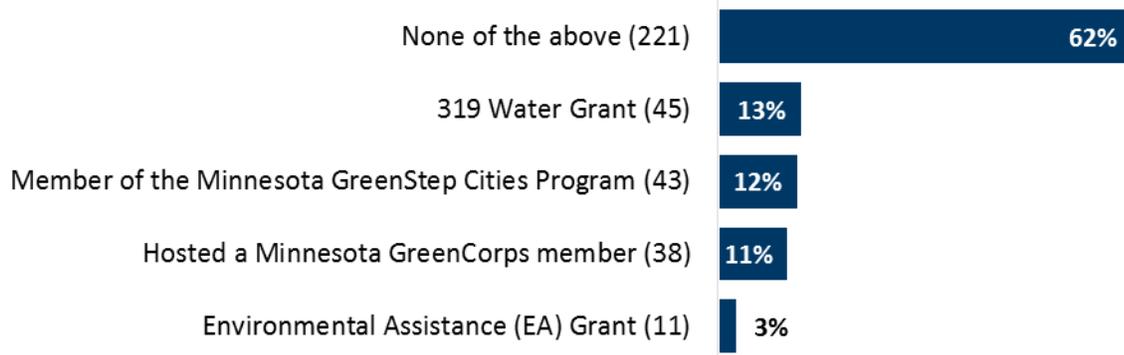
### Utilized resources

The 2019 survey added a new question about resources and partnerships organizations had used. Overall, more than one-third of respondents said they had used one of the listed resources or partnerships. Figure 15 shows that most often organizations had made use of the 319 Water Grant, the Minnesota GreenStep cities program, and/or hosted a Minnesota GreenCorps member. Appendix H on page 66 explores survey results based on whether respondents had used any of these resources. Appendix I on page 68 further explores survey results for respondents who participated in the Minnesota GreenStep cities program, respondents who hosted a Minnesota GreenCorps member, and respondents who participated in the 319 Water Grant Program.

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<sup>5</sup> MAD counted all of the planning options selected by each respondent and then derived the average for all respondents.

**Figure 15: Has your organization made use of the following resources or partnerships? Please check all that apply.**

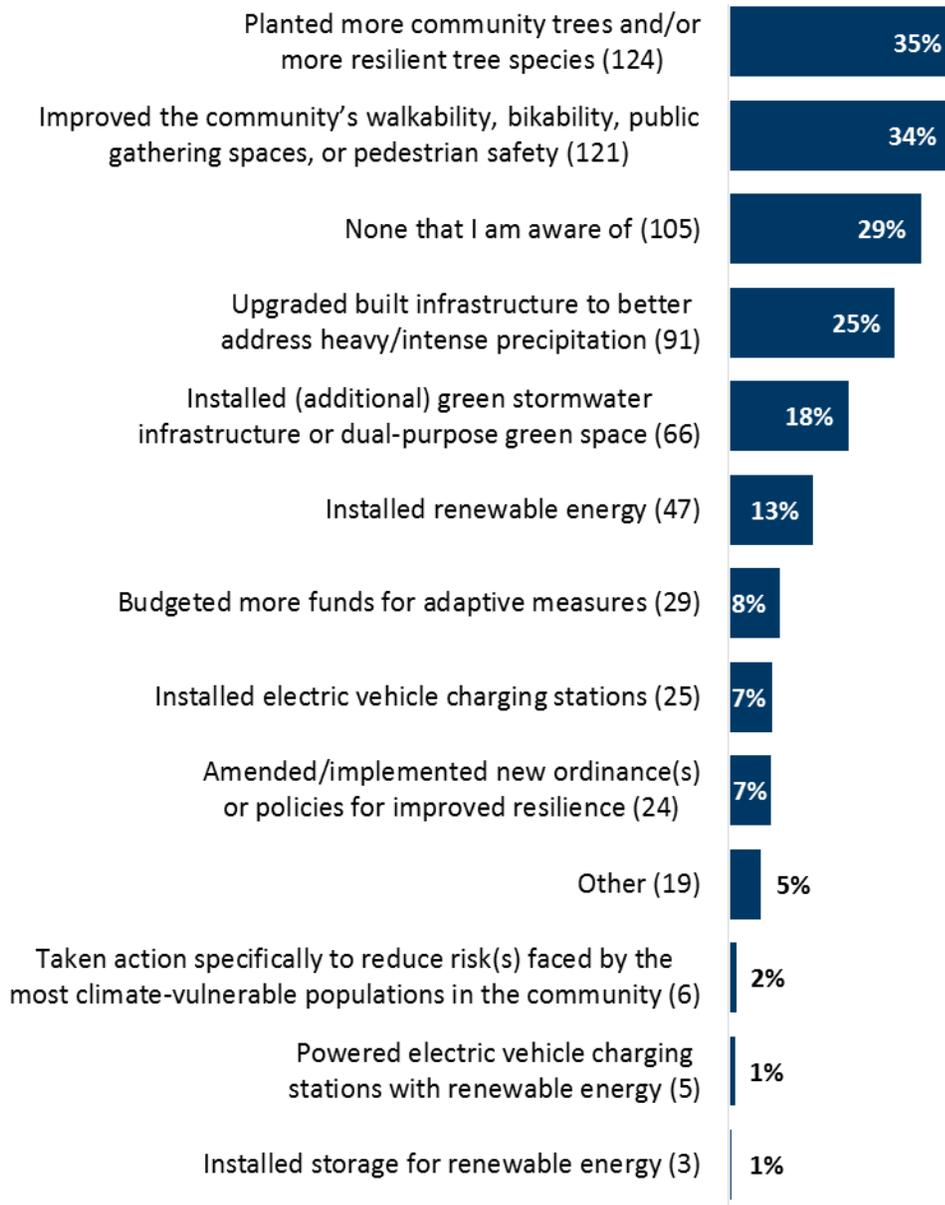


## Actions taken

The 2019 survey also added a question about actions their organizations have taken in the past three years to increase resilience in their community or environment. Figure 16 shows the results. Most often respondents said their organizations have planted more community trees and/or more resilient tree species (35 percent). Nearly as many said they had increased the community’s walkability, bikability, public gathering spaces, or pedestrian safety (34 percent). Almost 30 percent said they were not aware of any actions to increase resilience.

Some organizations have taken these actions without doing related planning that addresses climate adaptation and resilience. Of the organizations that said they have planted more trees or more resilient trees, 56 percent did not say they had a natural resources plan.

**Figure 16: In the past three years, what actions that you are aware of has your organization taken to increase the resiliency of the community or environment? Check all that apply.**



The survey asked respondents that selected “Taken action specifically to reduce the risk(s) faced by the most climate-vulnerable populations in the community” to describe the type of action their organization had taken. Of the six respondents that chose the option, five provided a response. They discussed flood control structures, building renovations, tree removal and replanting, and walking paths. They also described work within their organizations and communities to examine and highlight equity.

If respondents selected “Other,” the survey asked them to describe those actions. Of the 19 respondents that chose this option, 18 wrote a response. Comments included these actions:

- Planted a pollinator garden with plans for more.

- Considered impacts from climate change when developing conservation practice plans.
- Subscribed to solar energy and upgraded facilities to improve energy efficiency.
- Obtained a contract for solar renewable energy.
- Created an Urban Conservation program.
- Partnered with the county to convert home buy-out acreage to pollinator habitat.
- Outreached to community members.
- Invested in solar energy.
- Working on a Stormwater Retrofit Project.
- Promoted soil health practices for more resiliency
- Converted to LED lights in buildings and street lights
- Increased maintenance of conveyance systems adjacent to and downstream from flood prone areas and decreased maintenance of upstream conveyance facilities to encourage retention and detention of storm water.
- Began a water study.
- Passed an ordinance that requires land put in permanent conservation to achieve desired land use approvals.
- Reduced energy and water use, increased recycling and reduced waste, sustainable procurement, electrified the fleet.
- Participated in solar gardens.

On an earlier question about other planning (see page 16), many organizations described relevant actions their organization had taken that did not involve planning, including:

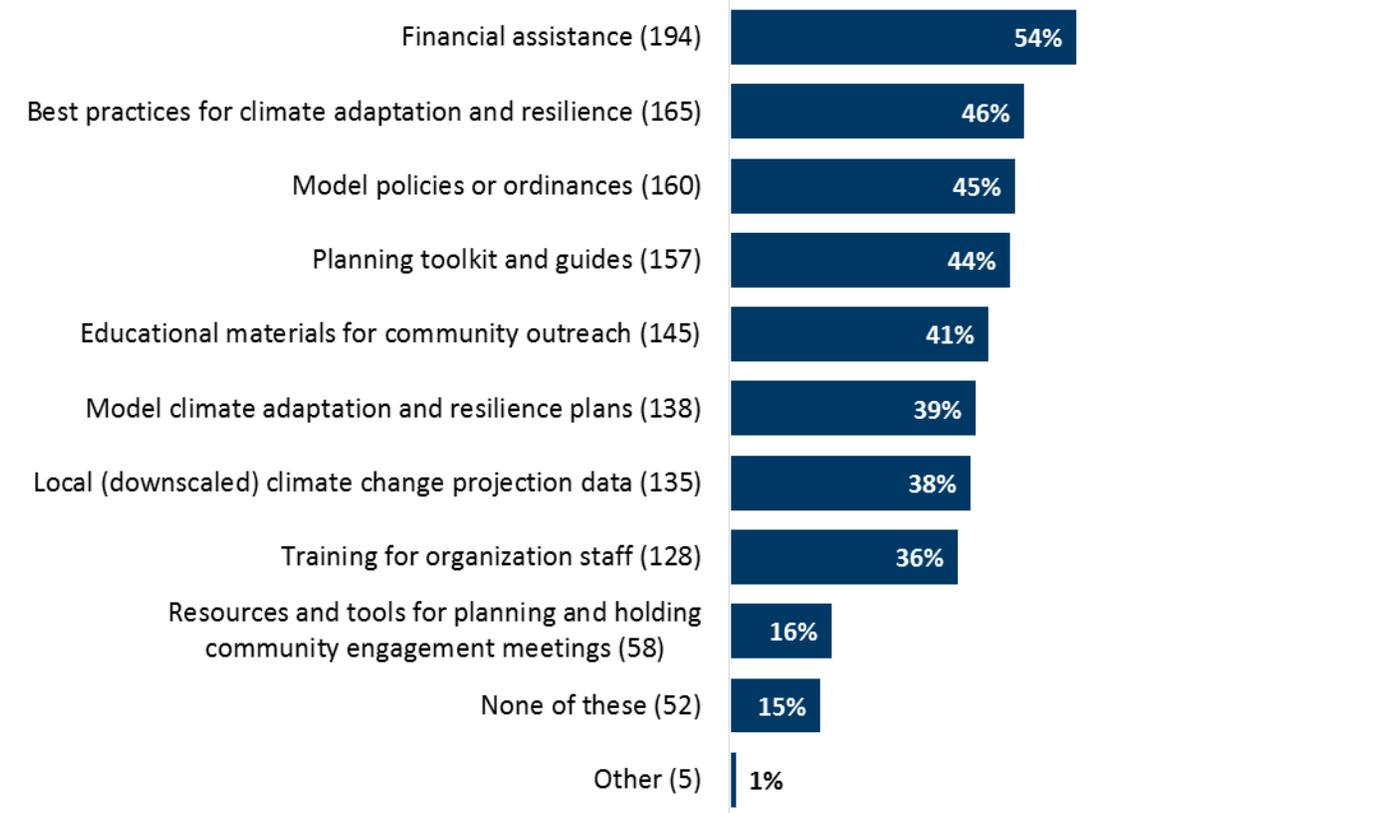
- Adopted energy codes.
- Offered resilience workshops.
- Had their staff attend relevant workshops and conferences.
- Changed landscaping to native grasses.
- Changed shorelines to better withstand storms.

## Identified resources or assistance

The survey sought information from respondents regarding what kind of resources or assistance would be most helpful to their organization for climate adaptation and resilience planning. In 2016, the most commonly selected option was “best practices for climate adaptation and resilience” (64 percent of respondents). While 46 percent of respondents chose this again in 2019, Figure 17 shows that the top option this year was “financial assistance” (54 percent of respondents). “Model policies or ordinances” and “planning toolkit and guides” remained near the top of the list in 2019.

Based on a response from the 2016 survey, this survey included “local (downscaled) climate change projection data” as a new option. More than one-third of respondents (38 percent) selected it.

**Figure 17: What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please check all that apply.**



If the respondent selected “Other,” the survey asked them to describe the resources or assistance that would be helpful. All five respondents that chose this option provided an answer:

- *Training for City Council members so they better understand the need to address climate change.*
- *Solar energy information (renewable energy).*
- *Increased staff capacity.*
- *We need a GreenStep Counties structure!*
- *USDN has a lot of best practices and toolkits. We best learn from other local cities. Met Council is building a resiliency team; how can MPCA, Met Council, and Admin Dept. at the state work to show model ways for cities?*

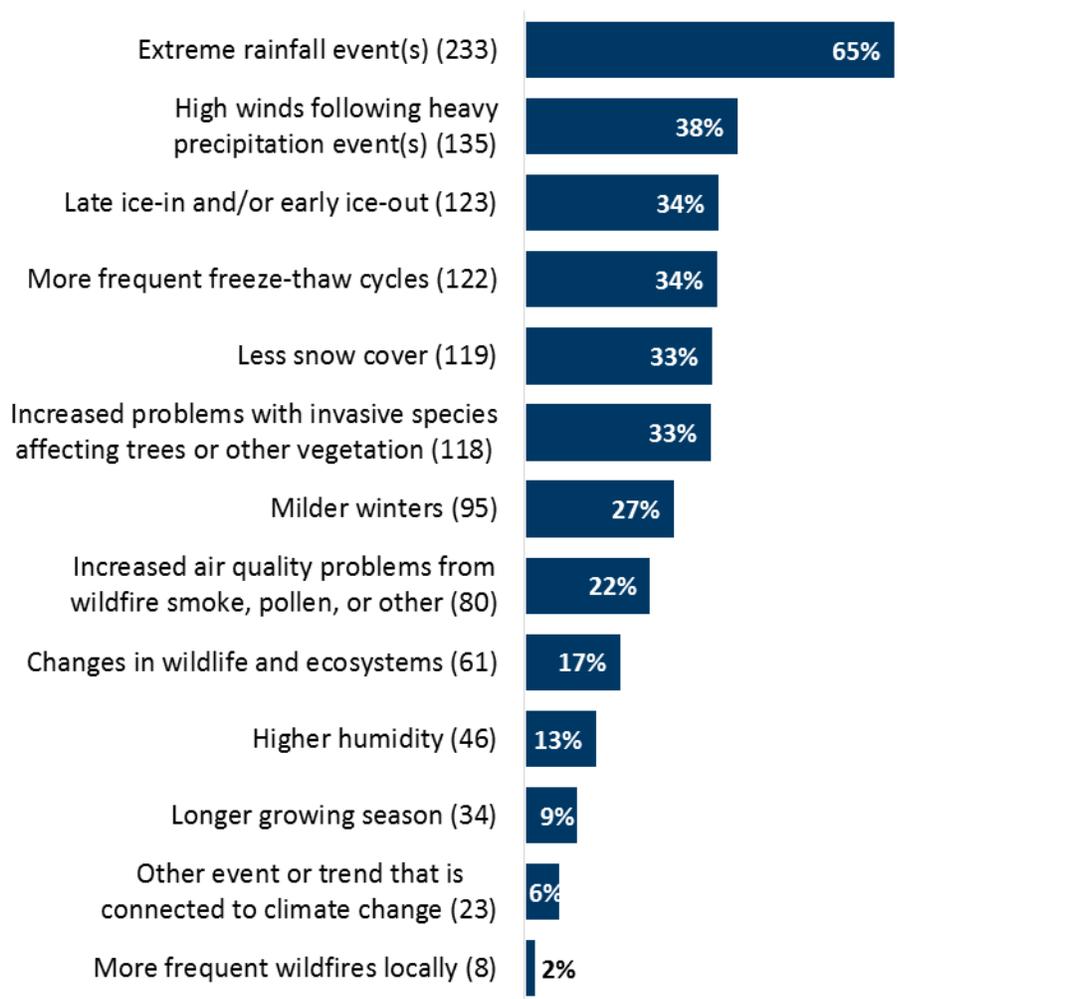
## Experience with events or trends associated with the changing climate

In an opening question to help set the context for the survey, respondents were asked to select from a list of events or trends associated with the changing climate that have affected their organization or community in the

past few years.<sup>6</sup> The list was not intended to be exhaustive. This question was designed to frame the issue for survey respondents and gather general ideas and impressions from respondents to potentially better understand organizational planning regarding climate adaptation and resilience.

Figure 18 shows the 2019 results. Overall, the vast majority of respondents (87 percent) selected at least one option. Most often respondents selected extreme rainfall events (65 percent), which is down slightly from 74 percent in 2016. “High winds following heavy precipitation event(s)” was a new choice in 2019. It became the second most popular option, with 38 percent of respondents selecting it.

**Figure 18: The following types of events and longer-term trends are associated with the changing climate. During the past few years, which of the following have affected your community (i.e., residents, economy, infrastructure, natural resources, etc.)? Please check all that apply.**



<sup>6</sup> The 2016 survey asked about events or trends within the past decade; the 2019 survey instead asked about the past few years.

Organizations that experienced one or more climate-related events or trends far more frequently identified plans or planning activities than those organizations that did not (see Appendix G on page 63).

If the respondent selected “other event or trend,” the survey asked them to describe the event or trend. About 5 percent of survey respondents offered comments. Several discussed increased snowfall, colder winters, and later or more erratic spring transitions. Several others said they had seen changes in rainfall and storm patterns, noting that the storms are now more extreme than they used to be.

A few respondents mentioned atypical flooding. The remaining comments discussed changes in lakes such as invasive species and temperature changes, crop rotation and selection, and extreme temperatures.

## Other comments from survey respondents

At the end of the survey, respondents were offered the opportunity to provide any additional thoughts, ideas, questions, or comments. About 10 percent of survey respondents provided some response to this question. Several were complimentary of the survey itself and the state’s prioritization of this topic, while others provided more detail on their earlier responses. A few survey respondents noted that they are small organizations, explaining that their limited staff capacity means they do not have the time or resources to do this sort of planning.

Several other respondents offered ideas for assistance that would be helpful. Example comments include:

- *Facilitate communication regarding the interrelationships between the various planning efforts that address components of climate change, e.g. watershed plans, hazard mitigation plans (flooding in particular), DNR land stewardship plans, county comprehensive plans.*
- *State leadership and guidance on this would go a long way to help communities plan and prepare for the future climate of Minnesota. Otherwise individual communities are left to trying to figure it out on their own; however, what are they planning for? What are the agreed upon future models, what should the regulations be, etc.?*
- *There are a lot of best practices out there. My [city’s] biggest issue is having the capacity to do this with all [the] other things on my plate. MN GreenCorps and other resources that build capacity are helpful. Before starting on an endeavor to support cities (for example, creating heat maps or adding to Regional Indicators), create a city taskforce that can inform you on needs.*

The general themes and relative proportions of them were largely similar to those in 2016. The 2016 results had more respondents stating that they are a small organization with limited capacity, and had more comments stating that climate adaptation and resilience should not be a priority.

# Key survey findings and recommendations for future surveys

## Key survey findings

Although the responding organizations may not be completely reflective of the state as a whole, the data from the survey can provide useful information to ICAT.

### Statewide indicator

A realistic indicator of statewide planning efforts can be calculated using survey data: 24.5 percent of organizations invited to participate in the survey (a better indicator than organizations that took the survey) report that they have at least one type of plan or planning effort with content that specifically addresses climate adaptation and resilience. This is an increase from 17.5 percent in 2016.

### Respondents' planning and actions

Responding governmental organizations are engaged in a wide range of planning efforts. Three-quarters of responding organizations have plans or are engaged in planning efforts that specifically address climate adaptation and resilience in some way. Many more organizations report being engaged in planning that addresses climate adaptation and resilience in the 2019 survey (75 percent) than in the 2016 survey (57 percent).

On average, organizations selected 4.6 of the 38 planning options listed. Relatively few are engaged in many different types of plans or planning efforts related to climate adaptation and resilience. Although the 2019 average was only 4.6 items, this is still an increase of more than one plan, up from an average of 3.3 in 2016.

Specific survey results regarding planning include:

- More than half of responding organizations are engaged in water plans or planning efforts with climate adaptation and resilience content. This increased from 40 percent in 2016.
- Nearly 45 percent of responding organizations indicated that they are engaged in health and safety planning efforts that include content on climate adaptation and resilience. This increased from 36 percent in 2016.
- Almost one-third of respondents have engaged in comprehensive planning efforts that include content on climate adaptation and resilience. This increased from 14 percent in 2016.
- Almost one-third of respondents indicated that they are engaged in some additional type of planning effort that includes climate adaptation and resilience. This increased from 21 percent in 2016.
- Relatively few responding organizations are engaged in standalone climate adaptation planning efforts.

- Within each question about broad types of planning (standalone, health and safety, natural resources, etc.), the most common response was “none of the above.”

When asked about actions their organizations have taken in the past three years to increase resilience in their community or environment, 65 percent of respondents selected at least one listed action. Most often respondents said their organizations have planted more community trees and/or more resilient tree species (35 percent). Nearly as many said they had increased the community’s walkability, bikability, public gathering spaces, or pedestrian safety (34 percent).

## Resources and assistance needed

Responding organizations provided input on the types of resources or assistance that would be helpful to their organization for climate adaptation and resilience planning. More than half of respondents (54 percent) chose “financial assistance.” While 64 percent of respondents in 2016 selected “best practices for climate adaptation and resilience,” only 46 percent of respondents made the same choice in 2019. “Model policies or ordinances” (45 percent) and “planning toolkit and guides” (44 percent) remained near the top of the list in 2019.

## Experience with events or trends associated with the changing climate

When asked whether different events or trends associated with the changing climate have affected their organization or community in the past few years, the vast majority of respondents (87 percent) selected at least one option. Respondents most often selected extreme rainfall events (65 percent), down slightly from 74 percent in 2016. Organizations that experienced one or more climate-related events or trends far more frequently identified plans or planning activities than those organizations that did not.

The largest change between the 2016 and 2019 results related to winter changes. While 51 percent of respondents chose “milder winters” in 2016, only 27 percent selected it in 2019. Less drastically, “increased air quality problems” was selected more often in 2019 (22 percent) compared with 2016 (13 percent).

## Recommendations for future surveys

MAD’s role in this project was survey development, administration, and analysis, with the expectation that ICAT would identify implications from the survey data and develop next steps. Advice on survey issues may be useful, however, so MAD offers the following recommendations for future surveys.

**Continue with planned survey timing:** MAD continues to recommend that ICAT conduct the survey on a roughly two-to-three-year cycle. This will provide relatively up-to-date information for measuring progress while simultaneously avoiding survey fatigue and allowing time for changes to take place. The 2019 results show that the prevalence of planning has changed since 2016.

**Review and potentially revise survey questions:** MAD recommends that the group consider adding or refining questions or topics:

- Review open-ended survey responses to the “other” options. These may offer additional options for questions in future surveys (or may suggest the need for clarification of options): for example, on this

survey multiple respondents commented about flooding as a climate event or trend affecting their communities.

- Explore different ways to ask about actions taken. The 2019 survey had a new question on this topic, but in most of the open-ended fields available on the survey—related to the question or not—respondents described the action they had taken. This may indicate the need to ask about actions earlier on in the survey or in a different way.
- Adjust question language where it makes sense. For instance, the question about climate-related events and trends had an option of “milder winters” in both survey years. However, when the survey launched in February 2019, Minnesota was undergoing the fourth-snowiest month on record. Significantly fewer respondents chose this option than in 2016. Shifting the language options to more variable choices rather than pre-designating a direction (e.g., “changes in winter severity” instead of “milder winters”) may more accurately gauge trends between surveys.

**Use the survey as an opportunity to educate:** On the question about resources and partnerships usage, only one-third of respondents indicated that they had used one of the listed options. The respondents that had not used the resources, and even some of those that had, may be curious about those resources. ICAT could provide links to those programs in the survey to help agencies find existing resources.

**Use restraint on survey expansion:** Although there are benefits to adding questions and collecting additional information, MAD suggests that ICAT be cautious. Maintaining a brief survey with narrow scope will minimize the burden on respondents, and maintaining the survey’s focus on climate adaptation and resilience planning will make it easier to repeat the survey and have consistent data over time.

# Appendix A: Methods detail

## Overview

**Number of survey recipients:** 1,088

**Survey in the field:** February 21, 2019, through March 13, 2019

**Distribution:** Contacts in city, county, and tribal governments; contacts for soil and water conservation districts, watershed districts, and selected state agencies (additional description below in *Survey recipients* section)

**Data collection:** Management Analysis and Development (MAD)

**Analysis/report:** MAD, with input from MPCA

**Design/sampling:** Attempt at a 100 percent census of the governmental organizations selected

## Survey recipients

MPCA obtained email lists of cities and counties from the League of Minnesota Cities and the Association of Minnesota Counties, respectively. The contacts for city governments were typically the city administrator, city clerk, city clerk/treasurer, or some combination of those titles. The contacts for counties were typically the county administrator or coordinator.

MPCA obtained lists for soil and water conservation districts, watershed districts, and water management organizations from the Minnesota Board of Water and Soil Resources. In these organizations, the survey typically went to the district manager or administrator.

MPCA supplied contact information for key state agencies, including ICAT contacts and leaders in large state agencies, and for tribal governments.

Tribal government contacts were typically in natural resources, environmental, or planning departments.

MAD sent an introductory email addressed from MPCA climate adaptation staff to these individuals to explain the survey, identify any outdated email addresses, and offer to change the contact person for the organization. MAD updated the original list to reflect changes in contact details.

## Survey development

The MPCA and MAD research team developed the survey questions based on the previous survey. They focused on questions that would facilitate the development of an overall indicator for climate adaptation and resilience planning and provide information about the extent of planning efforts across the state. The team intentionally did not include questions about barriers to implementation or attitudes regarding climate change.

MAD tested the questionnaire with its internal survey team and with MPCA staff.

## Survey administration and analysis

MAD administered the survey online using Snap Survey Software, which records data as questionnaires are completed. The survey invitation from MPCA climate adaptation staff indicated that MAD was conducting the survey for ICAT, and that MAD would maintain private data from survey respondents.

The survey was open from February 21, 2019, through March 13, 2019.

To increase response rates, MAD's survey software sent three reminder emails to nonrespondents during the course of the survey addressed from the MPCA Commissioner (first two) and MPCA climate adaptation staff (final); the final email indicated that the survey deadline was extended. When MAD received information from its system indicating that a message was not delivered to an email address, MAD attempted to obtain a valid address.

**Partial responses and data cleaning:** The survey dataset includes partial responses, but only those where the respondent advanced past the first question in the survey. MAD did not clean survey data.

**Precision of estimates and representativeness:** Researchers can provide information on precision of estimates (level of confidence or margin of sampling error) when survey respondents are selected randomly from a population and when survey response rates are sufficiently high. This survey was designed to collect information from as many representatives of Minnesota local, regional, tribal, and state governmental organizations as possible. Because this was not a truly random sample, it would not be appropriate to calculate measures such as margin of error.

The tables and charts in this report present the information provided by individual organizations that responded to the survey. Some surveys are designed to gauge the attitudes or behaviors of an entire population or group, and the results can be said to be representative. As noted above, this survey was designed to collect input from as many organizations as possible. The organizations that responded to this survey may not be representative of all governmental organizations—the survey respondents may be particularly interested in climate adaptation and resilience or may be more inclined to affirm that they are engaged in planning activities with content specifically related to climate adaptation or resilience.

# Appendix B: 2019 Climate Adaptation and Resilience Planning Survey

## Introductory text

**Thank you** for taking this survey! It will take about 5–10 minutes to complete.

The Minnesota Pollution Control Agency (MPCA) is conducting this survey to assess progress since its first survey in 2016 on efforts by Minnesota’s governmental entities to plan and prepare for the impacts of our changing climate. This survey has been sent to you as the contact for your organization. Please respond for your organization to the best of your ability, and feel free to ask others for input as well.

### **What is climate adaptation?**

*Climate adaptation* is developing and implementing strategies, initiatives and measures to help human and natural systems respond and become more resilient to the impacts of our changing climate. Observed and projected climate change in Minnesota includes: increasing intensity and frequency of heavy rainfall, decline in severity and frequency of extreme cold, and future increased incidence of heat waves and possibly drought.

### **Data privacy**

Management Analysis and Development (MAD) is conducting this survey. MAD is a division in Minnesota Management and Budget, which is a separate agency from the MPCA. Any potentially identifying information that you provide is considered private data under the Minnesota Data Practices Act (Minnesota Statutes §13.64). MAD will share summary reports and anonymized open-ended responses with the MPCA.

MAD will use methods such as rounding, aggregation, and data suppression to make sure no individual can be identified by their responses. For example, if there are only a few survey respondents in a group, MAD will combine that grouping with a larger group of respondents to ensure confidentiality.

### **Accessibility**

The MPCA is committed to providing access to everyone who wishes to participate in the survey. If you would prefer a text-based version of the survey (for example, if you use a screen reader), you can click on the link at the top of the page. If you need other accommodations in order to complete the survey, please contact Kristina Krull at [Kristina.Krull@state.mn.us](mailto:Kristina.Krull@state.mn.us).

### **Questions?**

If you have any questions about climate adaptation or resilience, please contact Laura Millberg at the MPCA at [laura.millberg@state.mn.us](mailto:laura.millberg@state.mn.us) or 651-757-2568.

If you have any technical problems with this survey, or if you received a link to the survey without receiving the email explaining the survey's purpose, please contact Kristina Krull at Kristina.Krull@state.mn.us or 651-259-3813.

### **If you cannot complete the survey at one time**

You can click "Save" at the bottom of the page to save your answers, and return to complete the survey later by using the survey link you received in your invitation.

**Thank you for your time!**

## **Questions**

**The following types of events and longer-term trends are associated with the changing climate. During the past few years, which of the following have affected your community (i.e., residents, economy, infrastructure, natural resources, etc.)? Please check all that apply.**

- Late ice-in and/or early ice-out
- More frequent freeze-thaw cycles
- Less snow cover
- Milder winters
- Extreme rainfall event(s)
- High winds following heavy precipitation event(s)
- Higher humidity
- More frequent wildfires locally
- Increased air quality problems from wildfire smoke, pollen, or other
- Increased problems with invasive species affecting trees or other vegetation
- Changes in wildlife and ecosystems
- Longer growing season
- Other event or trend that is connected to climate change

If you selected "other event or trend," please describe below:

Planning for climate change, including adaptation and resilience measures, is one approach that governmental organizations can take. The next series of questions asks for information about the types of plans your organization may have in place.

Each type of plan or planning effort does not apply to every organization—please check only those items that apply.

**Does your organization have a comprehensive plan with content that specifically addresses climate adaptation and resilience?**

- Comprehensive Plan with this content *adopted*
- Comprehensive Plan with this content *in process*
- None of the above

**Has your organization engaged in any of the following standalone planning efforts specifically to address climate adaptation and resilience? Please check all that apply.**

- Climate adaptation plan *completed*
- Climate adaptation plan *in process*
- Strategic framework for climate adaptation/resilience *completed*
- Strategic framework for climate adaptation/resilience *in process*
- Climate vulnerability assessment *completed*
- Climate vulnerability assessment *in process*
- Climate-vulnerable populations assessment *completed*
- Climate-vulnerable populations assessment *in process*
- None of the above

**Does your organization have any health and safety plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**

- Hazard mitigation (i.e. FEMA-related)
- Emergency response
- Continuity of operations
- Emergency operations
- Worker safety and work environment
- Public health (vector-borne diseases, extreme heat, asthma/air quality, etc.)
- Building codes inspection and enforcement
- None of the above

**Does your organization have any water plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**

- Sewer system
- Stormwater/erosion control
- Wastewater treatment facilities
- Water quantity (including groundwater)
- Water supply infrastructure
- Watershed
- Wellhead protection
- None of the above

**Does your organization have any natural resources plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**

- Parks and park facilities
- Open/green space (excluding parks)
- Forest management
- Invasive species
- Urban and community forestry
- None of the above

**Has your organization engaged in any additional planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**

- Capital budget
- Economic development
- Facilities and grounds (excluding parks and water systems)
- Energy
- Land use
- Solid waste
- Hazardous waste
- Construction and demolition waste
- Transportation/roads
- Workforce planning and development
- Strategic planning
- None of the above

**Has your organization engaged in any other planning with content specifically related to climate adaptation and resilience? Please provide a description below or click next.**

**In the past three years, what actions that you are aware of has your organization taken to increase the resiliency of the community or environment? Check all that apply.**

- Installed (additional) green stormwater infrastructure or dual-purpose green space
- Planted more community trees and/or more resilient tree species
- Upgraded built infrastructure to better address heavy/intense precipitation
- Installed renewable energy
- Installed storage for renewable energy
- Installed electric vehicle charging stations
- Powered electric vehicle charging stations with renewable energy
- Improved the community's walkability, bikability, public gathering spaces, or pedestrian safety
- Taken action specifically to reduce risk(s) faced by the most climate-vulnerable populations in the community
- Amended/implemented new ordinance(s) or policies for improved resilience
- Budgeted more funds for adaptive measures
- Other
- None that I am aware of

If you selected "Taken action specifically to reduce the risk(s) faced by the most climate-vulnerable populations in the community," please describe the type of action your organization has taken.

If you selected "Other," please describe what other actions your organization has taken.

**Has your organization made use of the following resources or partnerships? Please check all that apply.**

- Member of the Minnesota GreenStep Cities Program
- 319 Water Grant
- Environmental Assistance (EA) Grant
- Hosted a Minnesota GreenCorps member
- None of the above

**What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please check all that apply.**

- Best practices for climate adaptation and resilience
- Planning toolkit and guides
- Local (downscaled) climate change projection data
- Educational materials for community outreach
- Resources and tools for planning and holding community engagement meetings
- Financial assistance
- Model climate adaptation and resilience plans
- Model policies or ordinances
- Training for organization staff
- Other
- None of these

If you selected “other,” please describe the resources or assistance that would be helpful:

Please provide information about your organization and geographic area:

**Organization type**

- City
- County
- State
- Tribal government
- Watershed district
- Soil and water conservation district

**Number of employees in your organization**

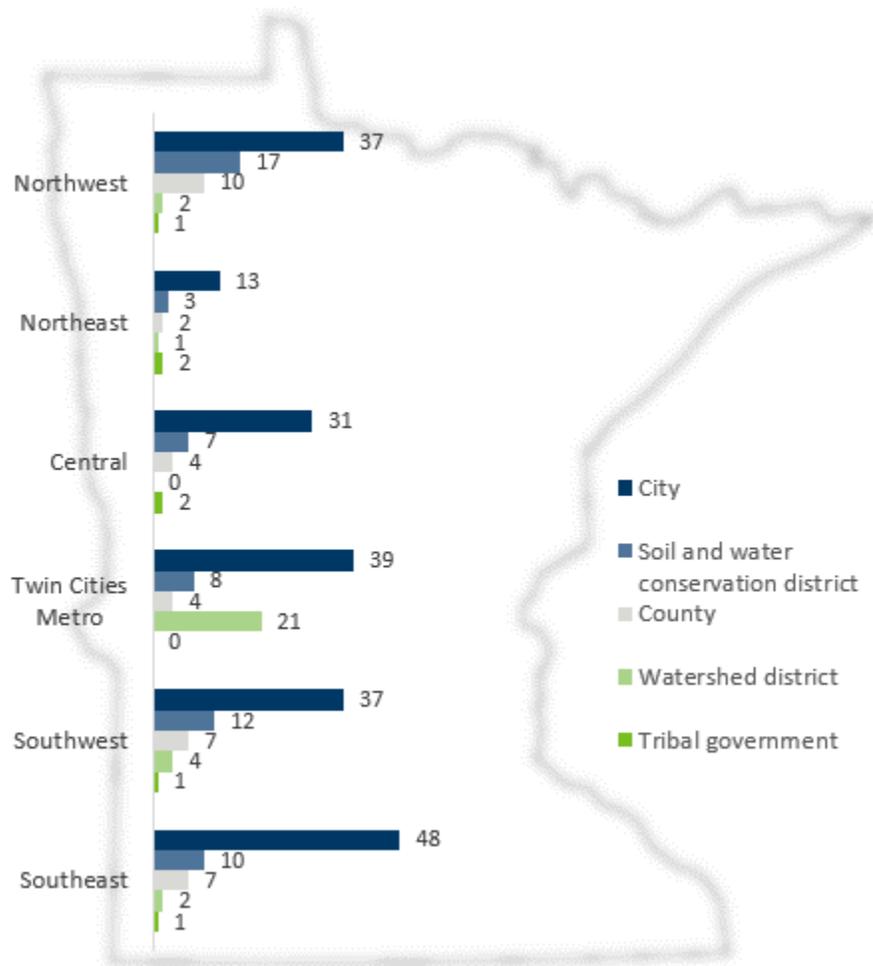
- 0–10
- 11–50
- 51–200
- 201–500
- 501–1,000
- over 1,000

**Please share any additional thoughts, ideas, questions, or comments below.**

Thank you for completing the survey! Please click “Submit” below to finish.

# Appendix C: Survey respondents by region and organization type

The figure and table below show the number of responses within each MPCA region by organization type. Statewide agencies are excluded.



| Region            | City | Soil and water conservation district | County | Watershed district | Tribal government |
|-------------------|------|--------------------------------------|--------|--------------------|-------------------|
| Northwest         | 37   | 17                                   | 10     | 2                  | 1                 |
| Northeast         | 13   | 3                                    | 2      | 1                  | 2                 |
| Central           | 31   | 7                                    | 4      | 0                  | 2                 |
| Twin Cities Metro | 39   | 8                                    | 4      | 21                 | 0                 |
| Southwest         | 37   | 12                                   | 7      | 4                  | 1                 |
| Southeast         | 48   | 10                                   | 7      | 2                  | 1                 |

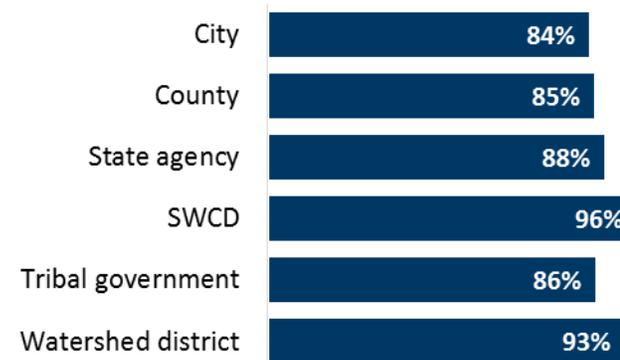
# Appendix D: Survey results—by broad categories

Selected survey results for respondents by organization type, size of organization, and region.

## Organization type

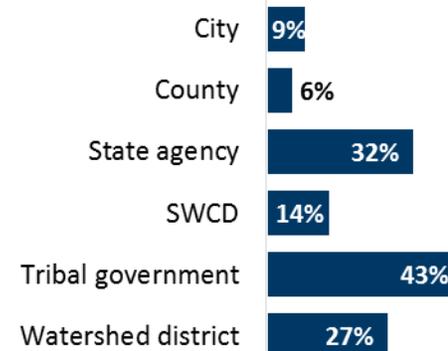
### Experienced any event or trend connected to climate change

| Org. type                            | None      | One or more | Total      | One or more % |
|--------------------------------------|-----------|-------------|------------|---------------|
| City                                 | 33        | 172         | 205        | 84%           |
| County                               | 5         | 29          | 34         | 85%           |
| State agency                         | 3         | 22          | 25         | 88%           |
| Soil and water conservation district | 2         | 55          | 57         | 96%           |
| Tribal government                    | 1         | 6           | 7          | 86%           |
| Watershed district                   | 2         | 28          | 30         | 93%           |
| <b>Total</b>                         | <b>46</b> | <b>312</b>  | <b>358</b> | <b>87%</b>    |



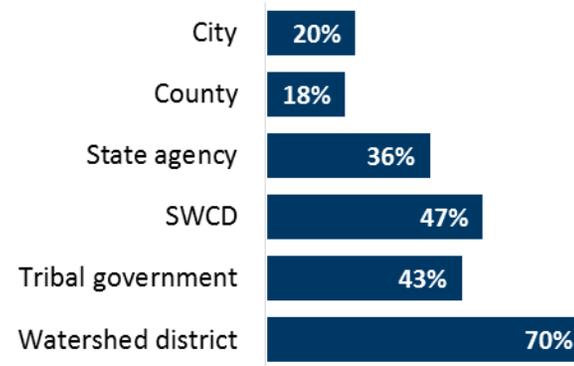
### Engaged in standalone planning activity specifically to address climate adaptation and resilience

| Org. type                            | None       | One or more | Total      | One or more % |
|--------------------------------------|------------|-------------|------------|---------------|
| City                                 | 187        | 18          | 205        | 9%            |
| County                               | 32         | 2           | 34         | 6%            |
| State agency                         | 17         | 8           | 25         | 32%           |
| Soil and water conservation district | 49         | 8           | 57         | 14%           |
| Tribal government                    | 4          | 3           | 7          | 43%           |
| Watershed district                   | 22         | 8           | 30         | 27%           |
| <b>Total</b>                         | <b>311</b> | <b>47</b>   | <b>358</b> | <b>13%</b>    |



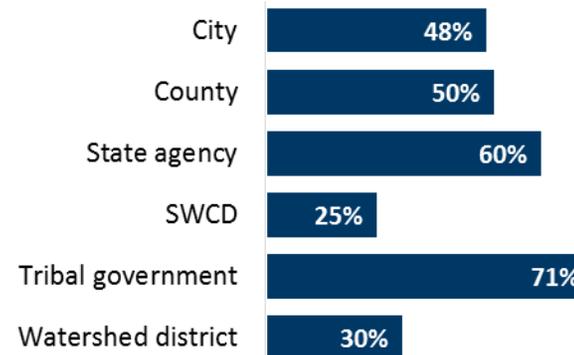
**Engaged in comprehensive planning with content specifically addressing climate adaptation and resilience**

| Org. type                            | None       | One or more | Total      | One or more % |
|--------------------------------------|------------|-------------|------------|---------------|
| City                                 | 164        | 41          | 205        | 20%           |
| County                               | 28         | 6           | 34         | 18%           |
| State agency                         | 16         | 9           | 25         | 36%           |
| Soil and water conservation district | 30         | 27          | 57         | 47%           |
| Tribal government                    | 4          | 3           | 7          | 43%           |
| Watershed district                   | 9          | 21          | 30         | 70%           |
| <b>Total</b>                         | <b>251</b> | <b>107</b>  | <b>358</b> | <b>30%</b>    |



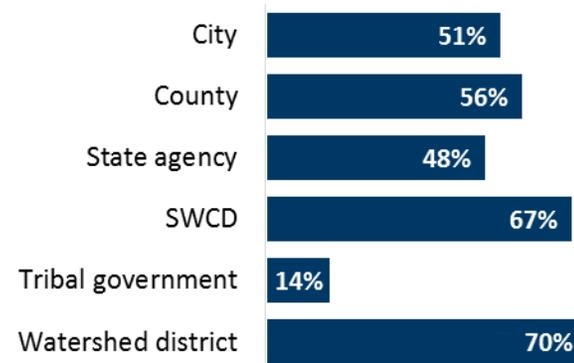
**Engaged in health/safety planning with content specifically addressing climate adaptation and resilience**

| Org. type                            | None       | One or more | Total      | One or more % |
|--------------------------------------|------------|-------------|------------|---------------|
| City                                 | 106        | 99          | 205        | 48%           |
| County                               | 17         | 17          | 34         | 50%           |
| State agency                         | 10         | 15          | 25         | 60%           |
| Soil and water conservation district | 43         | 14          | 57         | 25%           |
| Tribal government                    | 2          | 5           | 7          | 71%           |
| Watershed district                   | 21         | 9           | 30         | 30%           |
| <b>Total</b>                         | <b>199</b> | <b>159</b>  | <b>358</b> | <b>44%</b>    |



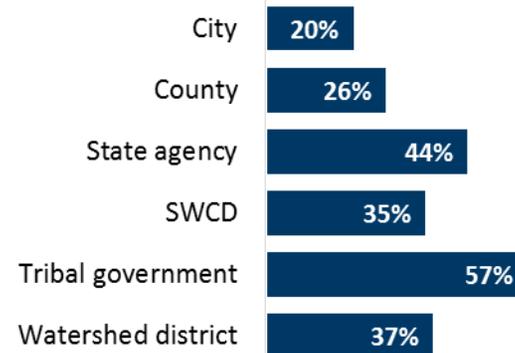
**Engaged in water planning with content specifically addressing climate adaptation and resilience**

| Org. type                            | None       | One or more | Total      | One or more % |
|--------------------------------------|------------|-------------|------------|---------------|
| City                                 | 100        | 105         | 205        | 51%           |
| County                               | 15         | 19          | 34         | 56%           |
| State agency                         | 13         | 12          | 25         | 48%           |
| Soil and water conservation district | 19         | 38          | 57         | 67%           |
| Tribal government                    | 6          | 1           | 7          | 14%           |
| Watershed district                   | 9          | 21          | 30         | 70%           |
| <b>Total</b>                         | <b>162</b> | <b>196</b>  | <b>358</b> | <b>55%</b>    |



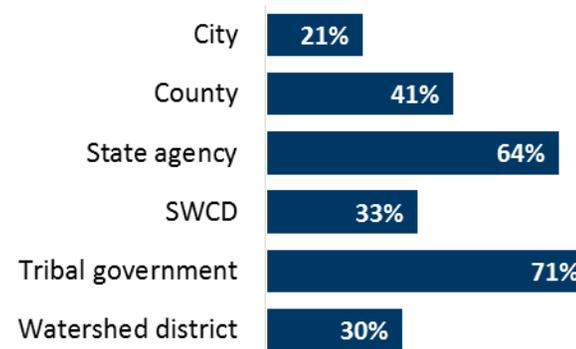
**Engaged in natural resources planning with content specifically addressing climate adaptation and resilience**

| Org. type                            | None       | One or more | Total      | One or more % |
|--------------------------------------|------------|-------------|------------|---------------|
| City                                 | 165        | 40          | 205        | 20%           |
| County                               | 25         | 9           | 34         | 26%           |
| State agency                         | 14         | 11          | 25         | 44%           |
| Soil and water conservation district | 37         | 20          | 57         | 35%           |
| Tribal government                    | 3          | 4           | 7          | 57%           |
| Watershed district                   | 19         | 11          | 30         | 37%           |
| <b>Total</b>                         | <b>263</b> | <b>95</b>   | <b>358</b> | <b>27%</b>    |



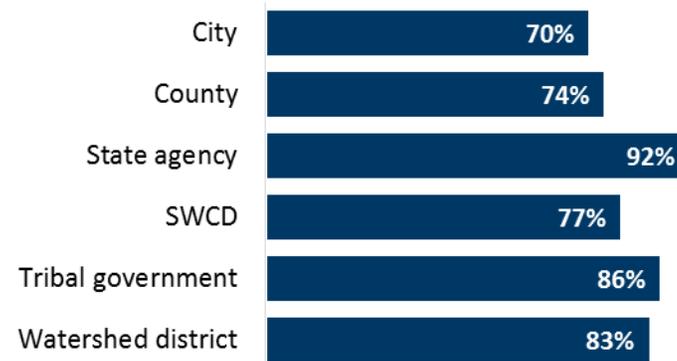
**Engaged in any additional planning with content specifically addressing climate adaptation and resilience**

| Org. type                            | None       | One or more | Total      | One or more % |
|--------------------------------------|------------|-------------|------------|---------------|
| City                                 | 161        | 44          | 205        | 21%           |
| County                               | 20         | 14          | 34         | 41%           |
| State agency                         | 9          | 16          | 25         | 64%           |
| Soil and water conservation district | 38         | 19          | 57         | 33%           |
| Tribal government                    | 2          | 5           | 7          | 71%           |
| Watershed district                   | 21         | 9           | 30         | 30%           |
| <b>Total</b>                         | <b>251</b> | <b>107</b>  | <b>358</b> | <b>30%</b>    |



**Engaged in any type of relevant planning activity (respondents who selected plans or planning efforts in any category)**

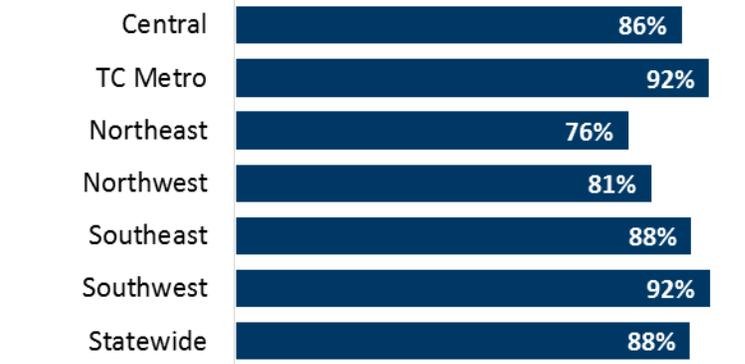
| Org. type                            | None      | One or more | Total      | One or more % |
|--------------------------------------|-----------|-------------|------------|---------------|
| City                                 | 61        | 144         | 205        | 70%           |
| County                               | 9         | 25          | 34         | 74%           |
| State agency                         | 2         | 23          | 25         | 92%           |
| Soil and water conservation district | 13        | 44          | 57         | 77%           |
| Tribal government                    | 1         | 6           | 7          | 86%           |
| Watershed district                   | 5         | 25          | 30         | 83%           |
| <b>Total</b>                         | <b>91</b> | <b>267</b>  | <b>358</b> | <b>75%</b>    |



# Region

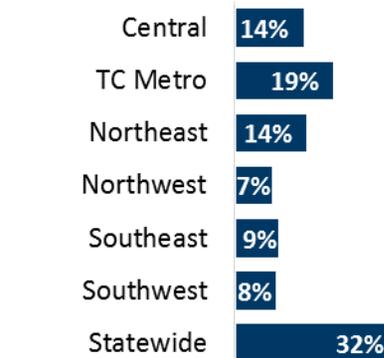
## Experienced any event or trend connected to climate change

| Region       | None      | One or more | Total      | One or more % |
|--------------|-----------|-------------|------------|---------------|
| Central      | 6         | 38          | 44         | 86%           |
| TC Metro     | 6         | 66          | 72         | 92%           |
| Northeast    | 5         | 16          | 21         | 76%           |
| Northwest    | 13        | 54          | 67         | 81%           |
| Southeast    | 8         | 60          | 68         | 88%           |
| Southwest    | 5         | 56          | 61         | 92%           |
| Statewide    | 3         | 22          | 25         | 88%           |
| <b>Total</b> | <b>46</b> | <b>312</b>  | <b>358</b> | <b>87%</b>    |



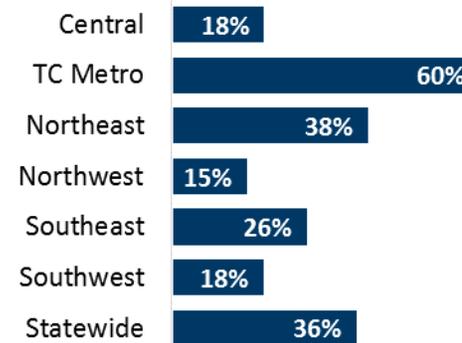
## Engaged in standalone planning activity specifically to address climate adaptation and resilience

| Region       | None       | One or more | Total      | One or more % |
|--------------|------------|-------------|------------|---------------|
| Central      | 38         | 6           | 44         | 14%           |
| TC Metro     | 58         | 14          | 72         | 19%           |
| Northeast    | 18         | 3           | 21         | 14%           |
| Northwest    | 62         | 5           | 67         | 7%            |
| Southeast    | 62         | 6           | 68         | 9%            |
| Southwest    | 56         | 5           | 61         | 8%            |
| Statewide    | 17         | 8           | 25         | 32%           |
| <b>Total</b> | <b>311</b> | <b>47</b>   | <b>358</b> | <b>13%</b>    |



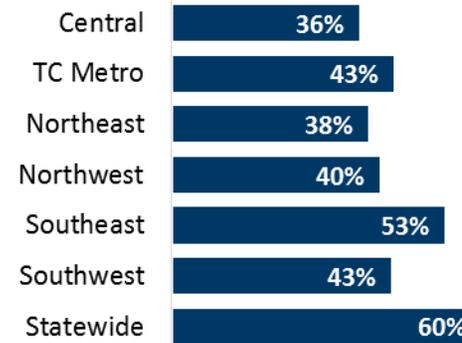
Engaged in comprehensive planning with content specifically addressing climate adaptation and resilience

| Region       | None       | One or more | Total      | One or more % |
|--------------|------------|-------------|------------|---------------|
| Central      | 36         | 8           | 44         | 18%           |
| TC Metro     | 29         | 43          | 72         | 60%           |
| Northeast    | 13         | 8           | 21         | 38%           |
| Northwest    | 57         | 10          | 67         | 15%           |
| Southeast    | 50         | 18          | 68         | 26%           |
| Southwest    | 50         | 11          | 61         | 18%           |
| Statewide    | 16         | 9           | 25         | 36%           |
| <b>Total</b> | <b>251</b> | <b>107</b>  | <b>358</b> | <b>30%</b>    |



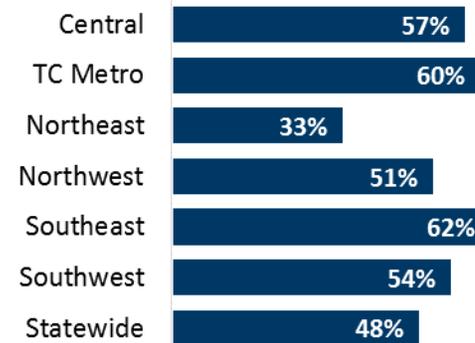
Engaged in health/safety planning with content specifically addressing climate adaptation and resilience

| Region       | None       | One or more | Total      | One or more % |
|--------------|------------|-------------|------------|---------------|
| Central      | 28         | 16          | 44         | 36%           |
| TC Metro     | 41         | 31          | 72         | 43%           |
| Northeast    | 13         | 8           | 21         | 38%           |
| Northwest    | 40         | 27          | 67         | 40%           |
| Southeast    | 32         | 36          | 68         | 53%           |
| Southwest    | 35         | 26          | 61         | 43%           |
| Statewide    | 10         | 15          | 25         | 60%           |
| <b>Total</b> | <b>199</b> | <b>159</b>  | <b>358</b> | <b>44%</b>    |



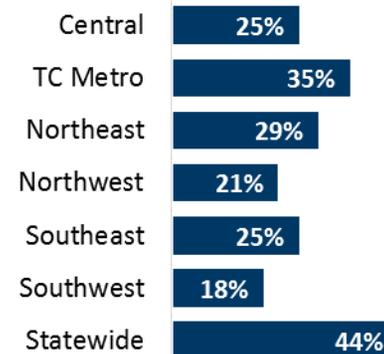
Engaged in water planning with content specifically addressing climate adaptation and resilience

| Region       | None       | One or more | Total      | One or more % |
|--------------|------------|-------------|------------|---------------|
| Central      | 19         | 25          | 44         | 57%           |
| TC Metro     | 29         | 43          | 72         | 60%           |
| Northeast    | 14         | 7           | 21         | 33%           |
| Northwest    | 33         | 34          | 67         | 51%           |
| Southeast    | 26         | 42          | 68         | 62%           |
| Southwest    | 28         | 33          | 61         | 54%           |
| Statewide    | 13         | 12          | 25         | 48%           |
| <b>Total</b> | <b>162</b> | <b>196</b>  | <b>358</b> | <b>55%</b>    |



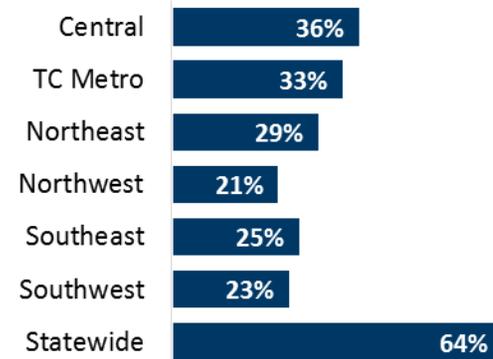
Engaged in natural resources planning with content specifically addressing climate adaptation and resilience

| Region       | None       | One or more | Total      | One or more % |
|--------------|------------|-------------|------------|---------------|
| Central      | 33         | 11          | 44         | 25%           |
| TC Metro     | 47         | 25          | 72         | 35%           |
| Northeast    | 15         | 6           | 21         | 29%           |
| Northwest    | 53         | 14          | 67         | 21%           |
| Southeast    | 51         | 17          | 68         | 25%           |
| Southwest    | 50         | 11          | 61         | 18%           |
| Statewide    | 14         | 11          | 25         | 44%           |
| <b>Total</b> | <b>263</b> | <b>95</b>   | <b>358</b> | <b>27%</b>    |



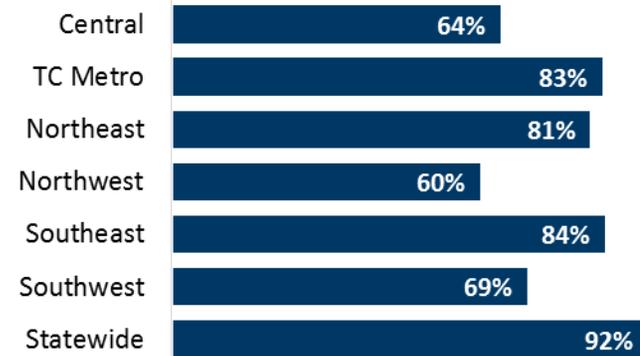
**Engaged in any additional planning with content specifically addressing climate adaptation and resilience**

| Region       | None       | One or more | Total      | One or more % |
|--------------|------------|-------------|------------|---------------|
| Central      | 28         | 16          | 44         | 36%           |
| TC Metro     | 48         | 24          | 72         | 33%           |
| Northeast    | 15         | 6           | 21         | 29%           |
| Northwest    | 53         | 14          | 67         | 21%           |
| Southeast    | 51         | 17          | 68         | 25%           |
| Southwest    | 47         | 14          | 61         | 23%           |
| Statewide    | 9          | 16          | 25         | 64%           |
| <b>Total</b> | <b>251</b> | <b>107</b>  | <b>358</b> | <b>30%</b>    |



**Engaged in any type of relevant planning activity (respondents who selected plans or planning efforts in any category)**

| Region       | None      | One or more | Total      | One or more % |
|--------------|-----------|-------------|------------|---------------|
| Central      | 16        | 28          | 44         | 64%           |
| TC Metro     | 12        | 60          | 72         | 83%           |
| Northeast    | 4         | 17          | 21         | 81%           |
| Northwest    | 27        | 40          | 67         | 60%           |
| Southeast    | 11        | 57          | 68         | 84%           |
| Southwest    | 19        | 42          | 61         | 69%           |
| Statewide    | 2         | 23          | 25         | 92%           |
| <b>Total</b> | <b>91</b> | <b>267</b>  | <b>358</b> | <b>75%</b>    |



# Greater Minnesota/Metro

Total rows represent the full survey set, including statewide agencies.

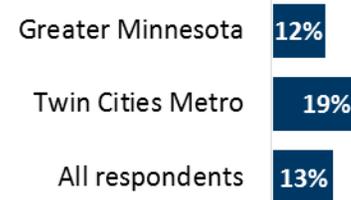
## Experienced any event or trend connected to climate change

| Region            | None      | One or more | Total      | One or more % |
|-------------------|-----------|-------------|------------|---------------|
| Greater Minnesota | 40        | 246         | 286        | 86%           |
| Twin Cities Metro | 6         | 66          | 72         | 92%           |
| <b>Total</b>      | <b>46</b> | <b>312</b>  | <b>358</b> | <b>87%</b>    |



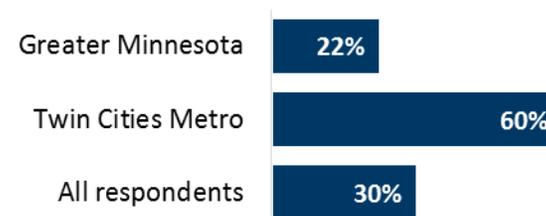
## Engaged in standalone planning activity specifically to address climate adaptation and resilience

| Region            | None       | One or more | Total      | One or more % |
|-------------------|------------|-------------|------------|---------------|
| Greater Minnesota | 253        | 33          | 286        | 12%           |
| Twin Cities Metro | 58         | 14          | 72         | 19%           |
| <b>Total</b>      | <b>311</b> | <b>47</b>   | <b>358</b> | <b>13%</b>    |



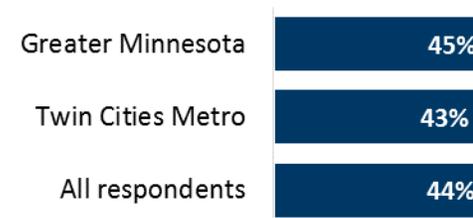
## Engaged in comprehensive planning with content specifically addressing climate adaptation and resilience

| Region            | None       | One or more | Total      | One or more % |
|-------------------|------------|-------------|------------|---------------|
| Greater Minnesota | 222        | 64          | 286        | 22%           |
| Twin Cities Metro | 29         | 43          | 72         | 60%           |
| <b>Total</b>      | <b>251</b> | <b>107</b>  | <b>358</b> | <b>30%</b>    |



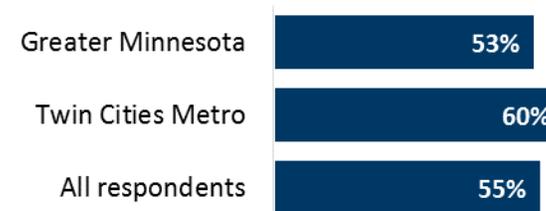
**Engaged in health/safety planning with content specifically addressing climate adaptation and resilience**

| Region            | None       | One or more | Total      | One or more % |
|-------------------|------------|-------------|------------|---------------|
| Greater Minnesota | 158        | 128         | 286        | 45%           |
| Twin Cities Metro | 41         | 31          | 72         | 43%           |
| <b>Total</b>      | <b>199</b> | <b>159</b>  | <b>358</b> | <b>44%</b>    |



**Engaged in water planning with content specifically addressing climate adaptation and resilience**

| Region            | None       | One or more | Total      | One or more % |
|-------------------|------------|-------------|------------|---------------|
| Greater Minnesota | 133        | 153         | 286        | 53%           |
| Twin Cities Metro | 29         | 43          | 72         | 60%           |
| <b>Total</b>      | <b>162</b> | <b>196</b>  | <b>358</b> | <b>55%</b>    |



**Engaged in natural resources planning with content specifically addressing climate adaptation and resilience**

| Region            | None       | One or more | Total      | One or more % |
|-------------------|------------|-------------|------------|---------------|
| Greater Minnesota | 216        | 70          | 286        | 24%           |
| Twin Cities Metro | 47         | 25          | 72         | 35%           |
| <b>Total</b>      | <b>263</b> | <b>95</b>   | <b>358</b> | <b>27%</b>    |



**Engaged in any additional planning with content specifically addressing climate adaptation and resilience**

| Region            | None       | One or more | Total      | One or more % |
|-------------------|------------|-------------|------------|---------------|
| Greater Minnesota | 203        | 83          | 286        | 29%           |
| Twin Cities Metro | 48         | 24          | 72         | 33%           |
| <b>Total</b>      | <b>251</b> | <b>107</b>  | <b>358</b> | <b>30%</b>    |



**Engaged in any type of relevant planning activity (respondents who selected plans or planning efforts in any category)**

| Region            | None      | One or more | Total      | One or more % |
|-------------------|-----------|-------------|------------|---------------|
| Greater Minnesota | 79        | 207         | 286        | 72%           |
| Twin Cities Metro | 12        | 60          | 72         | 83%           |
| <b>Total</b>      | <b>91</b> | <b>267</b>  | <b>358</b> | <b>75%</b>    |



# Number of employees

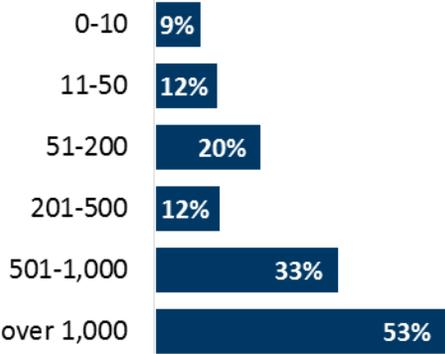
## Experienced any event or trend connected to climate change

| Org. employees | None      | One or more | Total      | One or more % |
|----------------|-----------|-------------|------------|---------------|
| 0-10           | 26        | 159         | 185        | 86%           |
| 11-50          | 7         | 53          | 60         | 88%           |
| 51-200         | 4         | 37          | 41         | 90%           |
| 201-500        | 3         | 22          | 25         | 88%           |
| 501-1,000      | 0         | 6           | 6          | 100%          |
| over 1,000     | 3         | 14          | 17         | 82%           |
| <b>Total</b>   | <b>46</b> | <b>312</b>  | <b>358</b> | <b>87%</b>    |



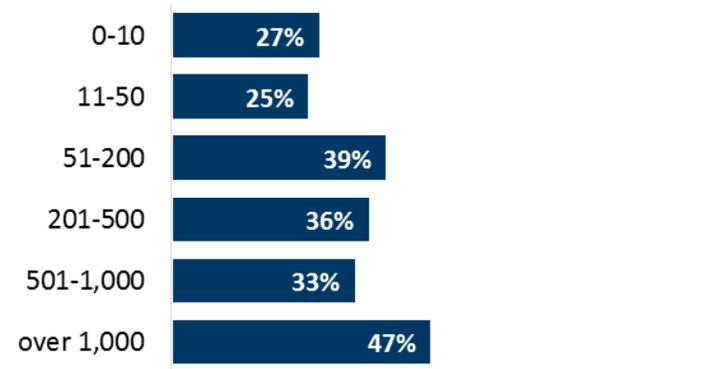
## Engaged in standalone planning activity specifically to address climate adaptation and resilience

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 169        | 16          | 185        | 9%            |
| 11-50          | 53         | 7           | 60         | 12%           |
| 51-200         | 33         | 8           | 41         | 20%           |
| 201-500        | 22         | 3           | 25         | 12%           |
| 501-1,000      | 4          | 2           | 6          | 33%           |
| over 1,000     | 8          | 9           | 17         | 53%           |
| <b>Total</b>   | <b>311</b> | <b>47</b>   | <b>358</b> | <b>13%</b>    |



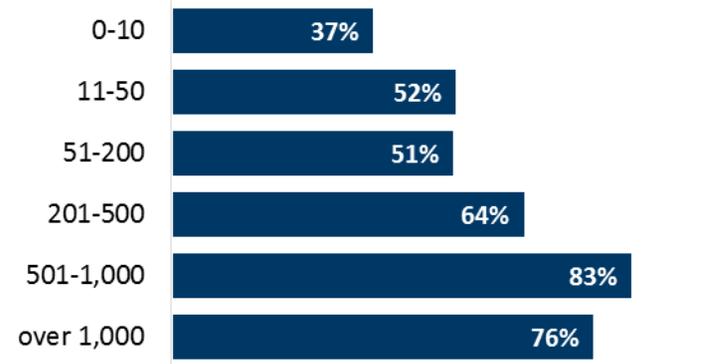
**Engaged in comprehensive planning with content specifically addressing climate adaptation and resilience**

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 135        | 50          | 185        | 27%           |
| 11-50          | 45         | 15          | 60         | 25%           |
| 51-200         | 25         | 16          | 41         | 39%           |
| 201-500        | 16         | 9           | 25         | 36%           |
| 501-1,000      | 4          | 2           | 6          | 33%           |
| over 1,000     | 9          | 8           | 17         | 47%           |
| <b>Total</b>   | <b>251</b> | <b>107</b>  | <b>358</b> | <b>30%</b>    |



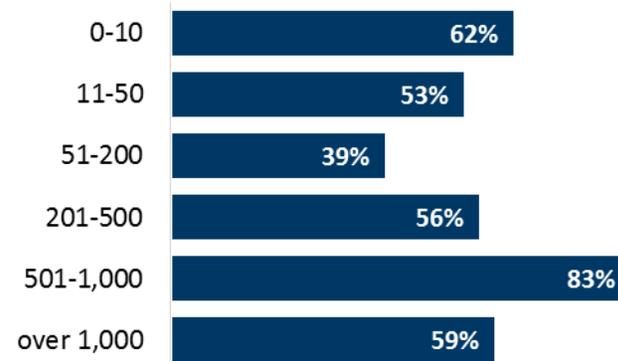
**Engaged in health/safety planning with content specifically addressing climate adaptation and resilience**

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 117        | 68          | 185        | 37%           |
| 11-50          | 29         | 31          | 60         | 52%           |
| 51-200         | 20         | 21          | 41         | 51%           |
| 201-500        | 9          | 16          | 25         | 64%           |
| 501-1,000      | 1          | 5           | 6          | 83%           |
| over 1,000     | 4          | 13          | 17         | 76%           |
| <b>Total</b>   | <b>199</b> | <b>159</b>  | <b>358</b> | <b>44%</b>    |



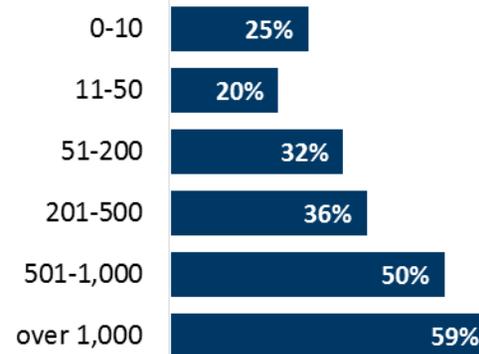
**Engaged in water planning with content specifically addressing climate adaptation and resilience**

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 70         | 115         | 185        | 62%           |
| 11-50          | 28         | 32          | 60         | 53%           |
| 51-200         | 25         | 16          | 41         | 39%           |
| 201-500        | 11         | 14          | 25         | 56%           |
| 501-1,000      | 1          | 5           | 6          | 83%           |
| over 1,000     | 7          | 10          | 17         | 59%           |
| <b>Total</b>   | <b>162</b> | <b>196</b>  | <b>358</b> | <b>55%</b>    |



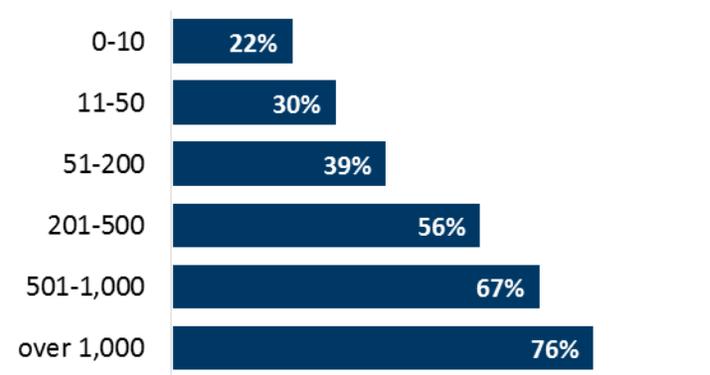
**Engaged in natural resources planning with content specifically addressing climate adaptation and resilience**

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 138        | 47          | 185        | 25%           |
| 11-50          | 48         | 12          | 60         | 20%           |
| 51-200         | 28         | 13          | 41         | 32%           |
| 201-500        | 16         | 9           | 25         | 36%           |
| 501-1,000      | 3          | 3           | 6          | 50%           |
| over 1,000     | 7          | 10          | 17         | 59%           |
| <b>Total</b>   | <b>263</b> | <b>95</b>   | <b>358</b> | <b>27%</b>    |



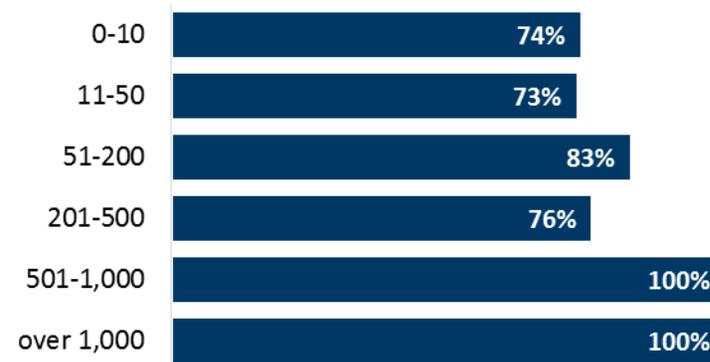
**Engaged in any additional planning with content specifically addressing climate adaptation and resilience**

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 144        | 41          | 185        | 22%           |
| 11-50          | 42         | 18          | 60         | 30%           |
| 51-200         | 25         | 16          | 41         | 39%           |
| 201-500        | 11         | 14          | 25         | 56%           |
| 501-1,000      | 2          | 4           | 6          | 67%           |
| over 1,000     | 4          | 13          | 17         | 76%           |
| <b>Total</b>   | <b>251</b> | <b>107</b>  | <b>358</b> | <b>30%</b>    |



**Engaged in any type of relevant planning activity (respondents who selected plans or planning efforts in any category)**

| Org. employees | None      | One or more | Total      | One or more % |
|----------------|-----------|-------------|------------|---------------|
| 0-10           | 48        | 137         | 185        | 74%           |
| 11-50          | 16        | 44          | 60         | 73%           |
| 51-200         | 7         | 34          | 41         | 83%           |
| 201-500        | 6         | 19          | 25         | 76%           |
| 501-1,000      | 0         | 6           | 6          | 100%          |
| over 1,000     | 0         | 17          | 17         | 100%          |
| <b>Total</b>   | <b>91</b> | <b>267</b>  | <b>358</b> | <b>75%</b>    |



# Appendix E: Survey results—cities by size and region

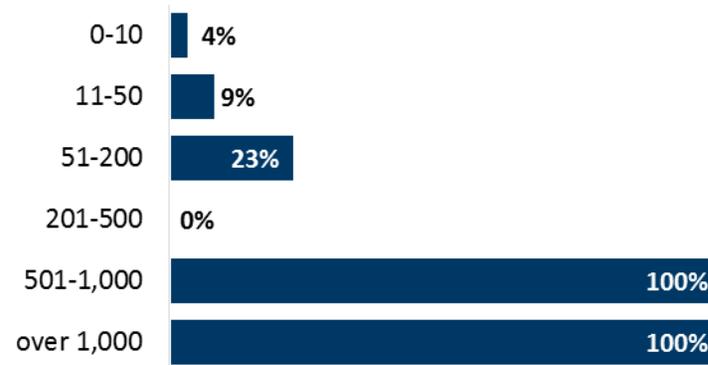
## Experienced any event or trend connected to climate change

| Org. employees | None      | One or more | Total      | One or more % |
|----------------|-----------|-------------|------------|---------------|
| 0–10           | 22        | 89          | 111        | 80%           |
| 11–50          | 7         | 40          | 47         | 85%           |
| 51–200         | 2         | 20          | 22         | 91%           |
| 201–500        | 0         | 6           | 6          | 100%          |
| 501–1,000      | 0         | 1           | 1          | 100%          |
| over 1,000     | 0         | 2           | 2          | 100%          |
| <b>Total</b>   | <b>33</b> | <b>172</b>  | <b>205</b> | <b>84%</b>    |



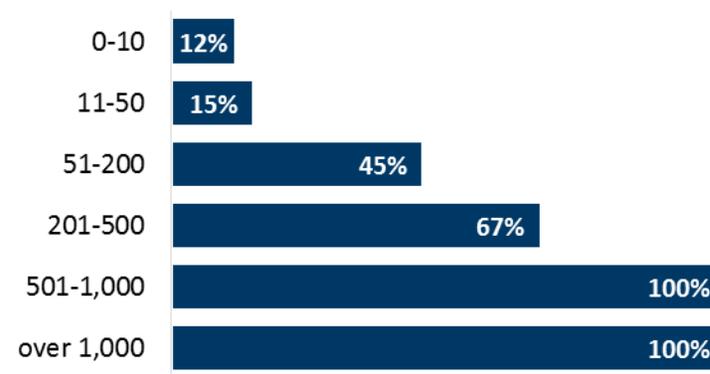
## Engaged in standalone planning activity specifically to address climate adaptation and resilience

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0–10           | 107        | 4           | 111        | 4%            |
| 11–50          | 43         | 4           | 47         | 9%            |
| 51–200         | 17         | 5           | 22         | 23%           |
| 201–500        | 6          | 0           | 6          | 0%            |
| 501–1,000      | 0          | 1           | 1          | 100%          |
| over 1,000     | 0          | 2           | 2          | 100%          |
| <b>Total</b>   | <b>187</b> | <b>18</b>   | <b>205</b> | <b>9%</b>     |



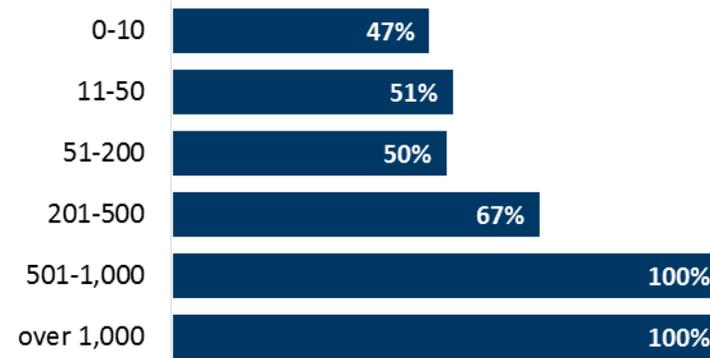
**Engaged in comprehensive planning with content specifically addressing climate adaptation and resilience**

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 98         | 13          | 111        | 12%           |
| 11-50          | 40         | 7           | 47         | 15%           |
| 51-200         | 12         | 10          | 22         | 45%           |
| 201-500        | 2          | 4           | 6          | 67%           |
| 501-1,000      | 0          | 1           | 1          | 100%          |
| over 1,000     | 0          | 2           | 2          | 100%          |
| <b>Total</b>   | <b>164</b> | <b>41</b>   | <b>205</b> | <b>20%</b>    |



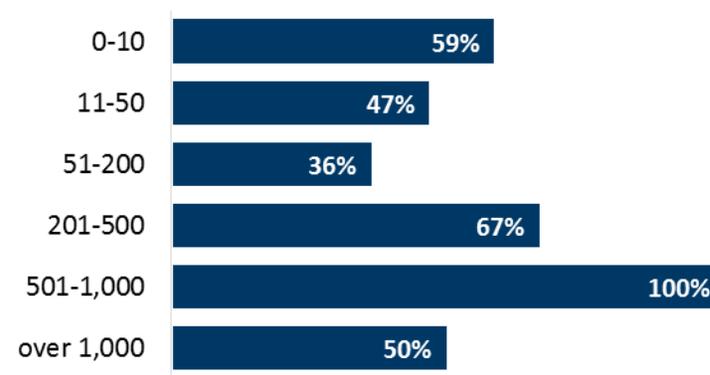
**Engaged in health/safety planning with content specifically addressing climate adaptation and resilience**

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 59         | 52          | 111        | 47%           |
| 11-50          | 23         | 24          | 47         | 51%           |
| 51-200         | 11         | 11          | 22         | 50%           |
| 201-500        | 2          | 4           | 6          | 67%           |
| 501-1,000      | 0          | 1           | 1          | 100%          |
| over 1,000     | 0          | 2           | 2          | 100%          |
| <b>Total</b>   | <b>106</b> | <b>99</b>   | <b>205</b> | <b>48%</b>    |



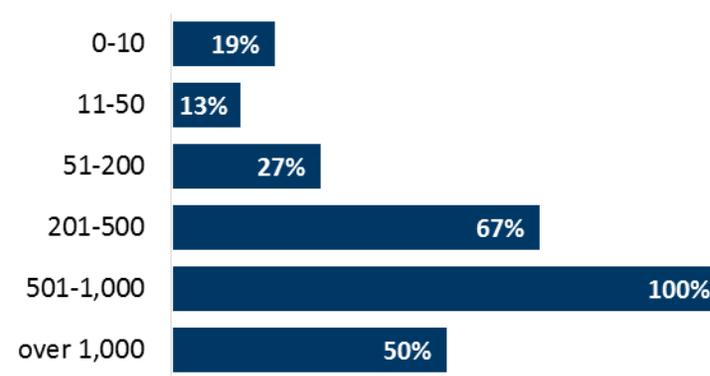
Engaged in water planning with content specifically addressing climate adaptation and resilience

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 46         | 65          | 111        | 59%           |
| 11-50          | 25         | 22          | 47         | 47%           |
| 51-200         | 14         | 8           | 22         | 36%           |
| 201-500        | 2          | 4           | 6          | 67%           |
| 501-1,000      | 0          | 1           | 1          | 100%          |
| over 1,000     | 1          | 1           | 2          | 50%           |
| <b>Total</b>   | <b>100</b> | <b>105</b>  | <b>205</b> | <b>51%</b>    |



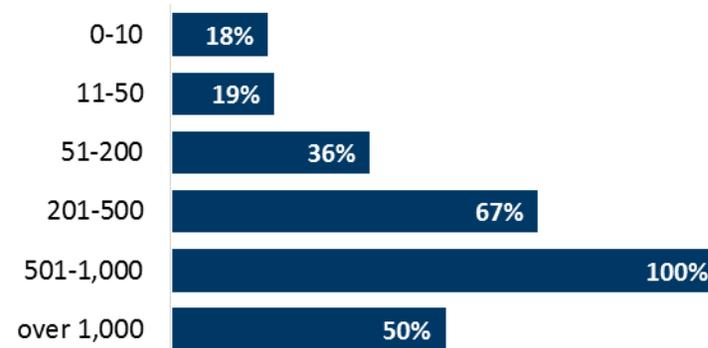
Engaged in natural resources planning with content specifically addressing climate adaptation and resilience

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 90         | 21          | 111        | 19%           |
| 11-50          | 41         | 6           | 47         | 13%           |
| 51-200         | 16         | 6           | 22         | 27%           |
| 201-500        | 2          | 4           | 6          | 67%           |
| 501-1,000      | 0          | 1           | 1          | 100%          |
| over 1,000     | 1          | 1           | 2          | 50%           |
| <b>Total</b>   | <b>165</b> | <b>40</b>   | <b>205</b> | <b>20%</b>    |



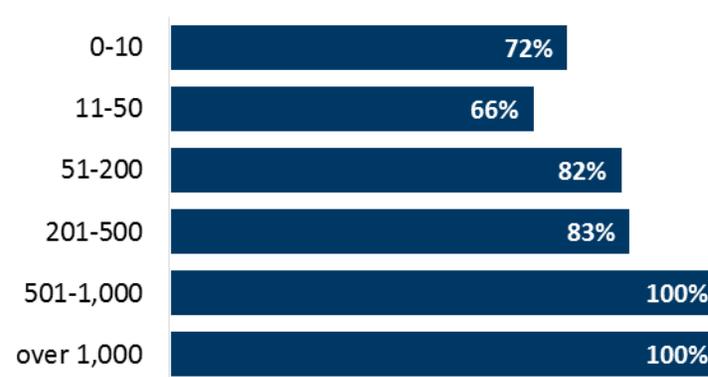
**Engaged in any additional planning with content specifically addressing climate adaptation and resilience**

| Org. employees | None       | One or more | Total      | One or more % |
|----------------|------------|-------------|------------|---------------|
| 0-10           | 91         | 20          | 111        | 18%           |
| 11-50          | 38         | 9           | 47         | 19%           |
| 51-200         | 14         | 8           | 22         | 36%           |
| 201-500        | 2          | 4           | 6          | 67%           |
| 501-1,000      |            | 1           | 1          | 100%          |
| over 1,000     | 1          | 1           | 2          | 50%           |
| <b>Total</b>   | <b>161</b> | <b>44</b>   | <b>205</b> | <b>21%</b>    |



**Engaged in any type of relevant planning activity (respondents who selected plans or planning efforts in any category)**

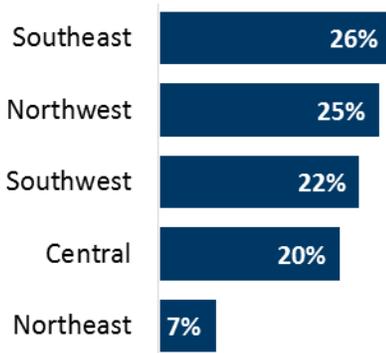
| Org. employees | None      | One or more | Total      | One or more % |
|----------------|-----------|-------------|------------|---------------|
| 0-10           | 31        | 80          | 111        | 72%           |
| 11-50          | 16        | 31          | 47         | 66%           |
| 51-200         | 4         | 18          | 22         | 82%           |
| 201-500        | 1         | 5           | 6          | 83%           |
| 501-1,000      | 0         | 1           | 1          | 100%          |
| over 1,000     | 0         | 2           | 2          | 100%          |
| <b>Total</b>   | <b>61</b> | <b>144</b>  | <b>205</b> | <b>70%</b>    |



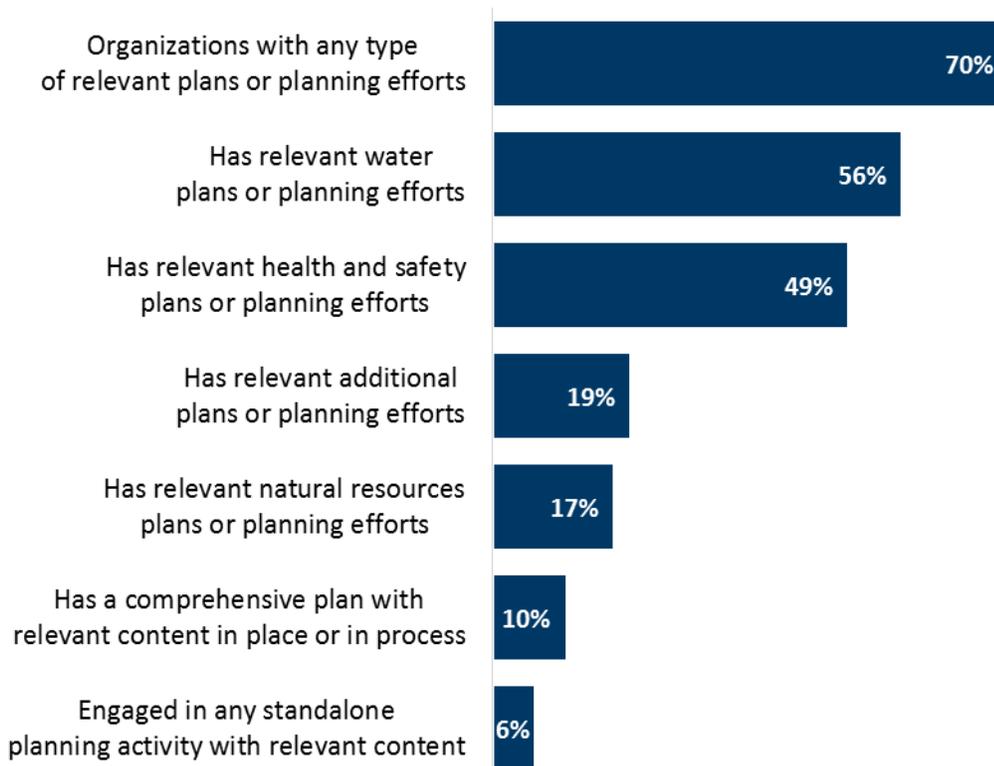
# Appendix F: Survey results—small cities in Greater Minnesota

A large and potentially interesting subset of organizations that responded to the survey is the set of small cities in Greater Minnesota. This appendix provides the survey results for cities that indicated that they have 0–10 or 11–50 employees and are located in the Northeast, Northwest, Central, Southwest, or Southeast region.

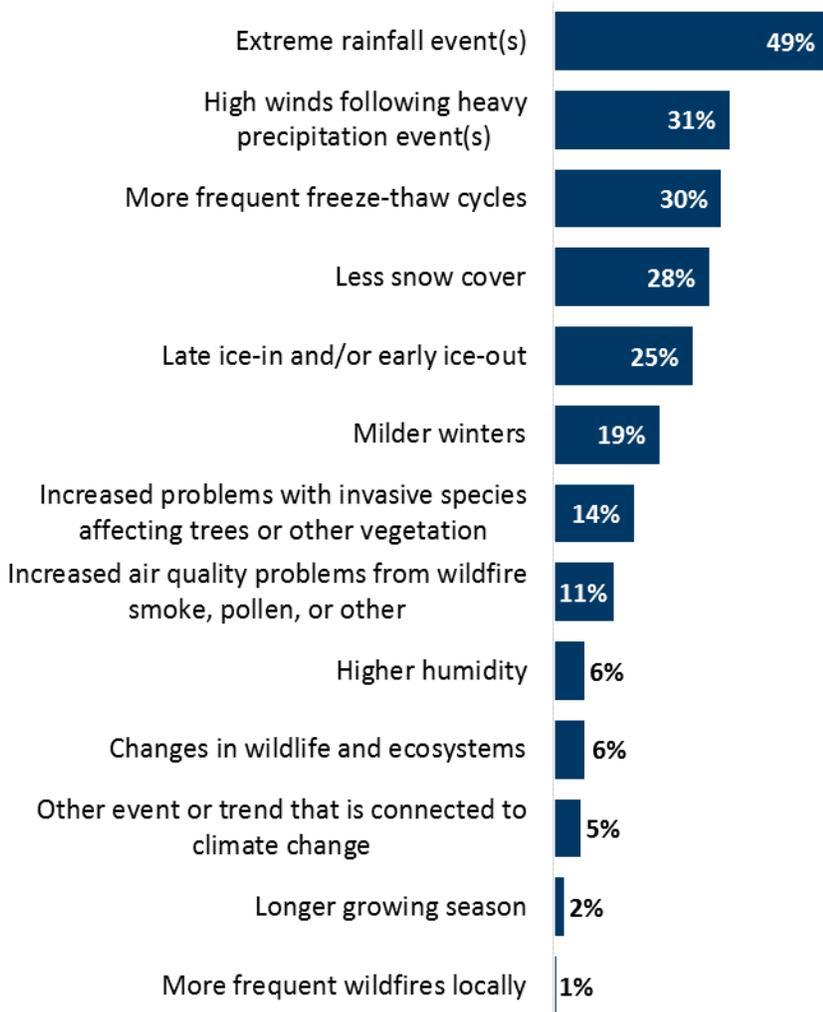
## Small cities by region (n=138)



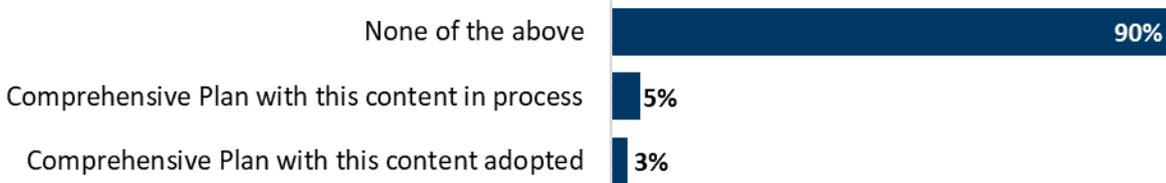
## Overview: small cities' planning efforts by type of plan (n=138)



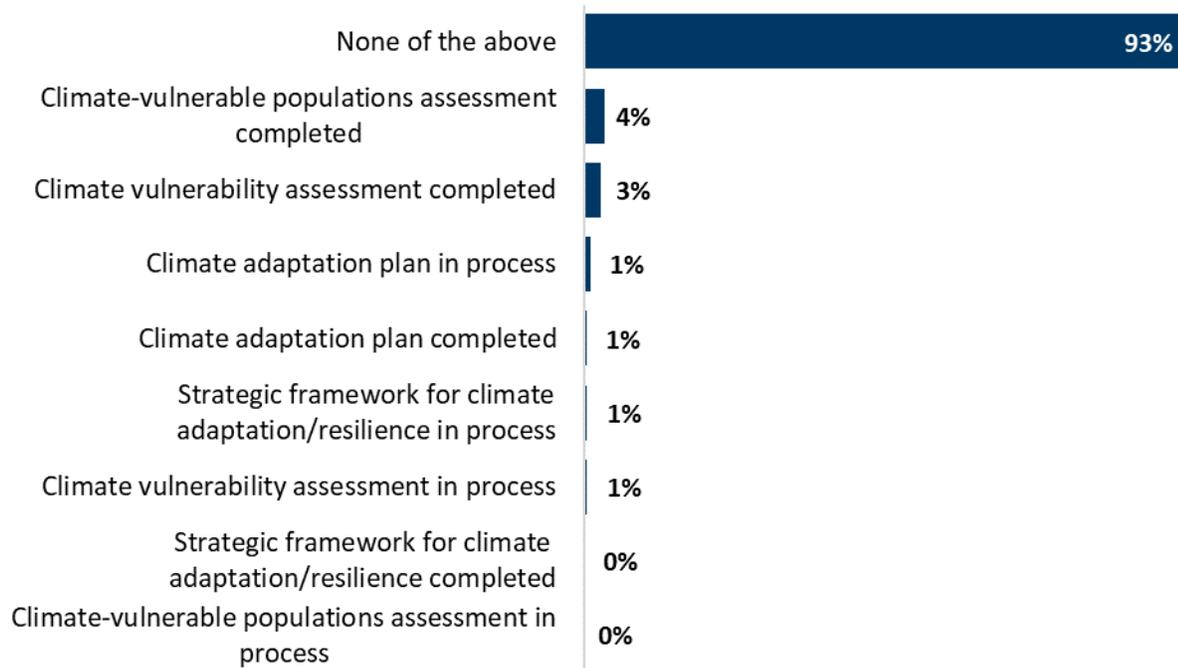
**Small cities: The following types of events and longer-term trends are associated with the changing climate. During the past few years, which of the following have affected your community (i.e., residents, economy, infrastructure, natural resources, etc.)? Please check all that apply.**



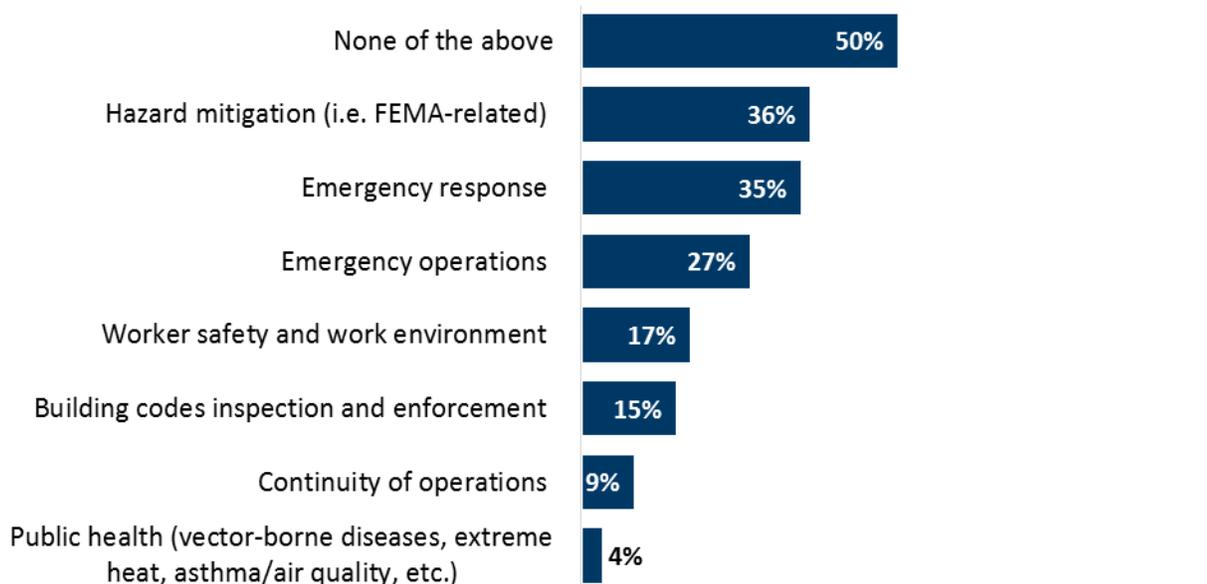
**Small cities: Does your organization have a comprehensive plan with content that specifically addresses climate adaptation and resilience?**



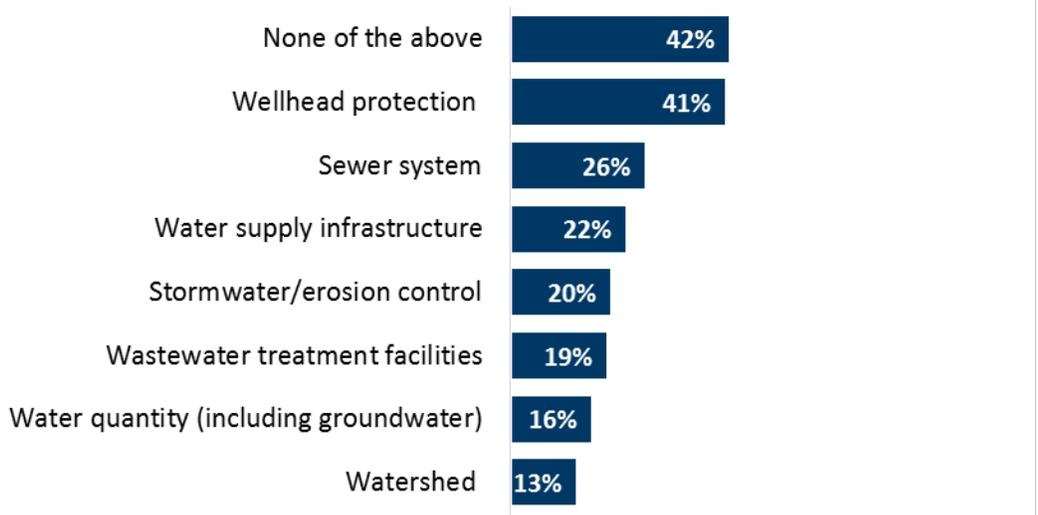
**Small cities: Has your organization engaged in any of the following standalone planning efforts specifically to address climate adaptation and resilience? Please check all that apply.**



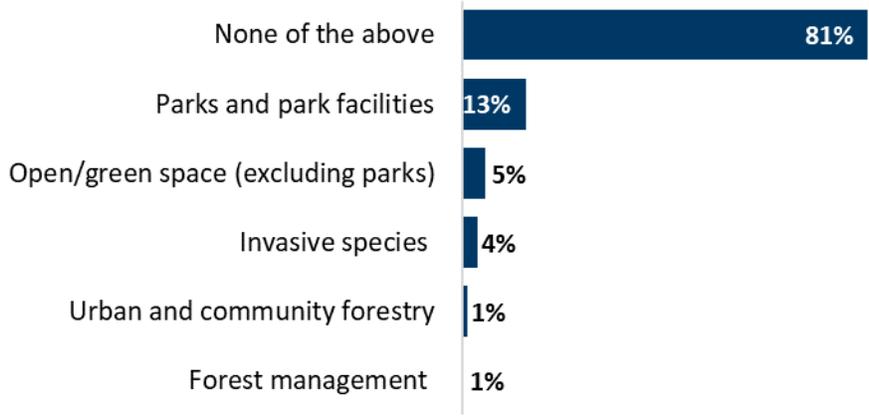
**Small cities: Does your organization have any health and safety plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**



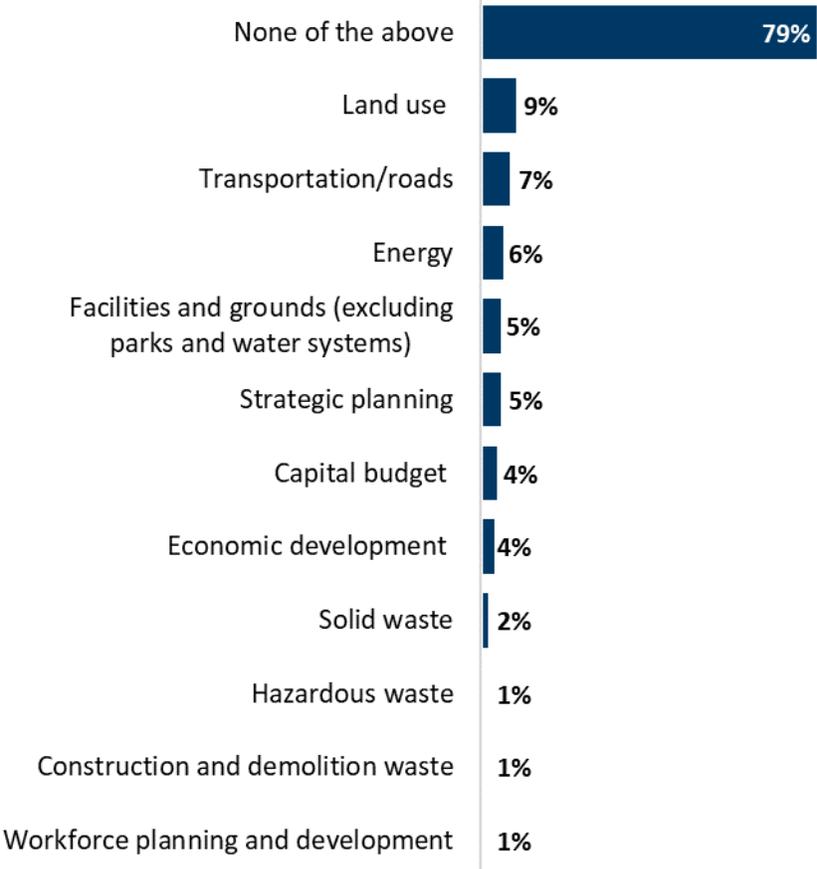
**Small cities: Does your organization have any water plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**



**Small cities: Does your organization have any natural resources plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**



**Small cities: Has your organization engaged in any additional planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply.**



**Small cities: What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please check all that apply.**



# Appendix G: Survey results—by experience with climate-related event or trend

This appendix explores organizations that have experienced climate-related events or trends and those that have not. In the tables below, the percent column represents the percentage of responding organizations of that characteristic (e.g., 84 percent of responding cities have experienced a climate-related event or trend).

## Organizations that experienced one or more climate-related event/trend (n=312)

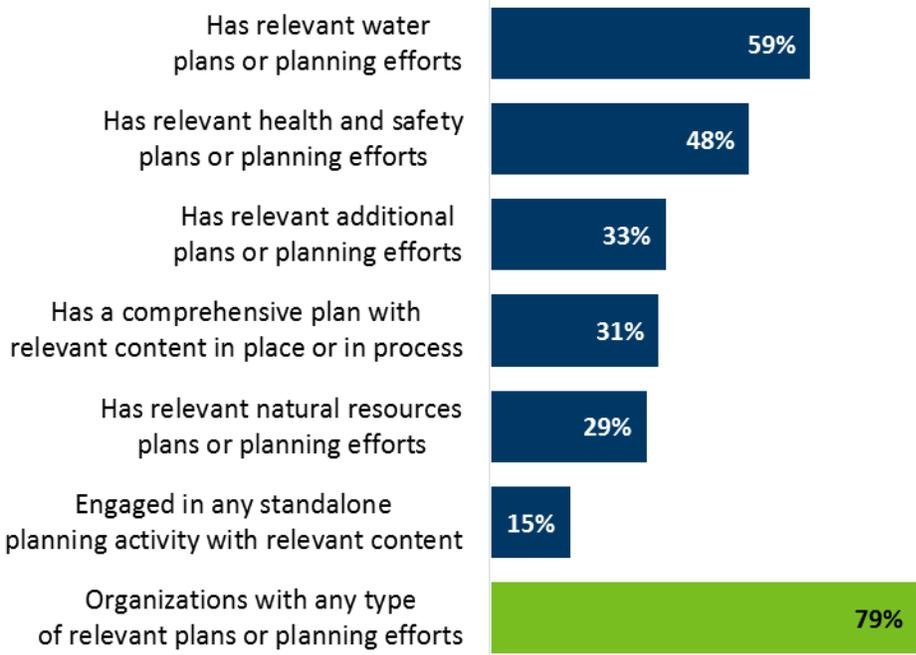
| Organization type                    | #   | %   |
|--------------------------------------|-----|-----|
| Soil and water conservation district | 55  | 96% |
| Watershed district                   | 28  | 93% |
| State agency                         | 22  | 88% |
| Tribal government                    | 6   | 86% |
| County                               | 29  | 85% |
| City                                 | 172 | 84% |

| Region            | #  | %   |
|-------------------|----|-----|
| Southwest         | 56 | 92% |
| Twin Cities Metro | 66 | 92% |
| Southeast         | 60 | 88% |
| Statewide         | 22 | 88% |
| Central           | 38 | 86% |
| Northwest         | 54 | 81% |
| Northeast         | 16 | 76% |

| Number of employees | #   | %    |
|---------------------|-----|------|
| 0–10                | 159 | 86%  |
| 11–50               | 53  | 88%  |
| 51–200              | 37  | 90%  |
| 201–500             | 22  | 88%  |
| 501–1,000           | 6   | 100% |
| over 1,000          | 14  | 82%  |

Figure 19 and Figure 20 show how many organizations have different types of plans, split based on whether or not they had experienced a climate-related event or trend within the past few years.

**Figure 19: Planning efforts of organizations that experienced climate-related event/trend (n=312)**



The trends in Figure 19 are similar to those from 2016. Water planning remained the most popular type of plan in 2019, and increased to 59 percent from 45 percent. The overall number of organizations with relevant plans or planning efforts also increased, to 79 percent from 64 percent.

**Figure 20: Planning efforts of organizations that DID NOT identify climate-related event/trend (n=46)**



The relative frequencies of plan types in Figure 20 are also similar to the results from 2016. Most often these organizations have a water plan with relevant content, and the number increased to 24 percent from 17 percent. Comprehensive plans with relevant content increased to 20 percent from 0 percent, and health and safety plans grew to 20 percent from 11 percent. The number with no standalone plan stayed at 0 percent, but the number with additional plans rose to 11 percent from 0 percent.

The number of organizations that did not identify a climate-related event/trend but that had a plan increased substantially, to 43 percent from 23 percent.

# Appendix H: Survey results—by resource usage

In total, 30 percent of respondents (107) said their organization had used one of the following resources:

- 319 Water Grant
- Member of the Minnesota GreenStep Cities Program
- Hosted a Minnesota GreenCorps member
- Environmental Assistance (EA) Grant

Those who had used at least one resource had a higher average number of plans (6.7) than those who had not used a resource (3.7). They also more often had taken at least one of the actions listed (85 percent) than those who had not used one of the resources (56 percent). Those who had used a resource had a higher average number of actions taken (2.7) than those who had not used these resources (1.1).

Those who had used a resource had different preferences for the types of assistance they would like. They more often chose every option listed, especially best practices and educational materials for community outreach.

| Desired assistance   | % of those who had used a listed resource | % of those who had NOT used a listed resource | % of all respondents |
|--|---|---|----------------------|
| Financial assistance   | 73%                                       | 46%   | 54%                  |
| Best practices for climate adaptation and resilience                       | 67%                                       | 37%   | 46%                  |
| Model policies or ordinances   | 50%                                       | 42%   | 45%                  |
| Planning toolkit and guides  | 54%                                       | 39%   | 44%                  |
| Educational materials for community outreach                               | 62%                                       | 31%   | 41%                  |
| Model climate adaptation and resilience plans                              | 55%                                       | 31%   | 39%                  |
| Local (downscaled) climate change projection data                          | 58%                                       | 29%   | 38%                  |
| Training for organization staff  | 51%                                       | 29%   | 36%                  |
| Resources and tools for planning and holding community engagement meetings | 29%                                       | 11%   | 16%                  |

Those who had used a resource more frequently reported taking the listed actions. The largest difference was for the action, “Planted more community trees and/or more resilient tree species.” About 60 percent of those who had used a resource reported that they had taken this action, compared with less than one-fourth of those who had not used a resource.

| <b>Action taken</b>   | <b>% of those who had used a listed resource</b> | <b>% of those who had NOT used a listed resource</b> | <b>% of all respondents</b> |
|---|--|--|-----------------------------|
| Planted more community trees and/or more resilient tree species   | 60%  | 24%  | 35%                         |
| Improved the community’s walkability, bikability, public gathering spaces, or pedestrian safety               | 49%  | 27%  | 34%                         |
| None that I am aware of   | 15%  | 35%  | 29%                         |
| Upgraded built infrastructure to better address heavy/intense precipitation                                   | 37%  | 20%  | 25%                         |
| Installed (additional) green stormwater infrastructure or dual-purpose green space                            | 39%  | 10%  | 18%                         |
| Installed renewable energy  | 31%  | 6%   | 13%                         |
| Budgeted more funds for adaptive measures   | 16%  | 5%   | 8%                          |
| Installed electric vehicle charging stations  | 13%  | 4%   | 7%                          |
| Amended/implemented new ordinance(s) or policies for improved resilience                                      | 9%   | 6%   | 7%                          |
| Other   | 7%   | 5%   | 5%                          |
| Taken action specifically to reduce risk(s) faced by the most climate-vulnerable populations in the community | 4%   | 1%   | 2%                          |
| Powered electric vehicle charging stations with renewable energy  | 5%   | 0%   | 1%                          |
| Installed storage for renewable energy  | 2%   | 0%   | 1%                          |

# Appendix I: Resources and partnerships

MPCA has a particular interest in how three programs may be affecting organizations’ climate adaptation planning: Minnesota GreenStep Cities Program members, organizations that hosted Minnesota GreenCorps members, and organizations that were Clean Water Act Section 319 Water Grant Program recipients (319 Water Grant). MAD analyzed survey responses among these three groups of respondents.

## Minnesota GreenStep Cities

The tables and charts below illustrate the responses of organizations that identified themselves as members of the Minnesota GreenStep Cities Program and those who did not. The majority of the 43 organizations identified as GreenStep Cities are city governments, but several are other types of organizations (state agencies, districts, or tribal government). For ease of analysis and comparison across the survey report, the data below show GreenStep Cities and all Non-GreenStep Cities organizations of all types. Responses are listed in the same order as they appear in the body of the report (sorted by highest proportion of responses in the whole data set).

### Planning activities

The figures below show the types of planning activities GreenStep Cities and Non-GreenStep Cities take. In general, participants in GreenStep Cities engage in more planning efforts than their counterparts. The two groups were most closely matched in water planning efforts—the majority of both groups had some type of water plan or planning effort.

**Figure 21. Overview of planning efforts**

|   | Non-GreenStep Cities<br>(n=315) |     | GreenStep Cities (n=43) |     | % compare |
|---|---------------------------------|-----|-------------------------|-----|-----------|
|   | #                               | %   | #                       | %   |           |
| Has a comprehensive plan with relevant content in place or in process | 83                              | 26% | 24                      | 56% |           |
| Engaged in any standalone planning activity with relevant content     | 43                              | 14% | 16                      | 37% |           |
| Has relevant health and safety plans or planning efforts              | 153                             | 49% | 26                      | 60% |           |
| Has relevant water plans or planning efforts                          | 194                             | 62% | 26                      | 60% |           |
| Has relevant natural resource plans or planning efforts               | 98                              | 31% | 19                      | 44% |           |
| Has additional relevant plans or planning efforts                     | 112                             | 36% | 24                      | 56% |           |
| Organizations with any type of relevant plans or planning efforts     | 230                             | 73% | 37                      | 86% |           |

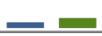
**Figure 22. Comprehensive planning**

| Does your organization have a comprehensive plan with content that specifically addresses climate adaptation and resilience? | Non-GreenStep Cities (n=315) |     | GreenStep Cities (n=43) |     | % compare |
|--|------------------------------|-----|-------------------------|-----|-----------|
|  | #                            | %   | #                       | %   |           |
| None of the above  | 232                          | 74% | 19                      | 44% |           |
| Comprehensive Plan with this content <i>in process</i>   | 39                           | 12% | 18                      | 42% |           |
| Comprehensive Plan with this content <i>adopted</i>  | 35                           | 11% | 6                       | 14% |           |

**Figure 23. Standalone planning**

| Has your organization engaged in any of the following standalone planning efforts specifically to address climate adaptation and resilience? Please check all that apply. | Non-GreenStep Cities (n=315) |     | GreenStep Cities (n=43) |     | % compare |
|---|------------------------------|-----|-------------------------|-----|-----------|
|   | #                            | %   | #                       | %   |           |
| None of the above   | 272                          | 86% | 27                      | 63% |           |
| Strategic framework for climate adaptation/resilience <i>in process</i>   | 10                           | 3%  | 7                       | 16% |           |
| Climate-vulnerable populations assessment completed   | 6                            | 2%  | 9                       | 21% |           |
| Climate adaptation plan in process  | 10                           | 3%  | 5                       | 12% |           |
| Climate vulnerability assessment completed  | 9                            | 3%  | 5                       | 12% |           |
| Climate vulnerability assessment in process   | 8                            | 3%  | 4                       | 9%  |           |
| Strategic framework for climate adaptation/resilience completed   | 8                            | 3%  | 2                       | 5%  |           |
| Climate adaptation plan completed   | 8                            | 3%  | 0                       | 0%  |           |
| Climate-vulnerable populations assessment in process  | 3                            | 1%  | 1                       | 2%  |           |

**Figure 24. Health and safety planning**

| Does your organization have any health and safety plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-GreenStep Cities<br>(n=315) |     | GreenStep Cities<br>(n=43) |     | % compare   |
|--|---------------------------------|-----|----------------------------|-----|---|
|  | #                               | %   | #                          | %   |   |
| None of the above  | 162                             | 51% | 17                         | 40% |  |
| Emergency response   | 89                              | 28% | 19                         | 44% |  |
| Hazard mitigation  | 88                              | 28% | 17                         | 40% |  |
| Emergency operations   | 70                              | 22% | 15                         | 35% |  |
| Worker safety and work environment   | 50                              | 16% | 9                          | 21% |  |
| Building codes inspection and enforcement  | 33                              | 10% | 11                         | 26% |  |
| Continuity of operations   | 28                              | 9%  | 7                          | 16% |  |
| Public health  | 22                              | 7%  | 7                          | 16% |  |

**Figure 25. Water planning**

| Does your organization have any water plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-GreenStep Cities<br>(n=315) |     | GreenStep Cities<br>(n=43) |     | % compare   |
|--|---------------------------------|-----|----------------------------|-----|---|
|  | #                               | %   | #                          | %   |   |
| None of the above  | 121                             | 38% | 17                         | 40% |  |
| Wellhead protection  | 93                              | 30% | 12                         | 28% |  |
| Stormwater/erosion control   | 86                              | 27% | 17                         | 40% |  |
| Watershed  | 92                              | 29% | 8                          | 19% |  |
| Water quantity (including groundwater)   | 67                              | 21% | 14                         | 33% |  |
| Sewer system   | 50                              | 16% | 7                          | 16% |  |
| Water supply infrastructure  | 47                              | 15% | 9                          | 21% |  |
| Wastewater treatment facilities  | 34                              | 11% | 6                          | 14% |  |

**Figure 26. Natural resource planning**

| Does your organization have any natural resources plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-GreenStep Cities (n=315) |     | GreenStep Cities (n=43) |     | % compare   |
|--|------------------------------|-----|-------------------------|-----|---|
|  | #                            | %   | #                       | %   |   |
| None of the above  | 217                          | 69% | 24                      | 56% |  |
| Invasive species   | 42                           | 13% | 11                      | 26% |  |
| Parks and park facilities  | 30                           | 10% | 6                       | 14% |  |
| Open/green space (excluding parks)   | 28                           | 9%  | 6                       | 14% |  |
| Urban and community forestry   | 13                           | 4%  | 13                      | 30% |  |
| Forest management  | 20                           | 6%  | 5                       | 12% |  |

**Figure 27. Additional planning**

| Has your organization engaged in any additional planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-GreenStep Cities (n=315) |     | GreenStep Cities (n=43) |     | % compare   |
|---|------------------------------|-----|-------------------------|-----|---|
|   | #                            | %   | #                       | %   |   |
| None of the above   | 203                          | 64% | 19                      | 44% |  |
| Land use  | 39                           | 12% | 6                       | 14% |  |
| Strategic planning  | 33                           | 10% | 9                       | 21% |  |
| Energy  | 26                           | 8%  | 14                      | 33% |  |
| Transportation/roads  | 23                           | 7%  | 7                       | 16% |  |
| Solid waste   | 16                           | 5%  | 6                       | 14% |  |
| Facilities and grounds  | 19                           | 6%  | 2                       | 5%  |  |
| Capital budget  | 15                           | 5%  | 3                       | 7%  |  |
| Construction and demolition waste   | 11                           | 3%  | 1                       | 2%  |  |
| Economic development  | 9                            | 3%  | 3                       | 7%  |  |
| Workforce planning and development  | 7                            | 2%  | 3                       | 7%  |  |
| Hazardous waste   | 6                            | 2%  | 1                       | 2%  |  |

## Actions taken

The figure below shows the types of actions taken to increase resiliency. In general, GreenStep Cities were more likely to have taken an action than other types of survey respondents. The largest differences were "Planted more community trees and/or more resilient tree species" and "Improved the community's walkability, bikability, public gathering spaces, or pedestrian safety;" over three-fourths of responding GreenStep Cities had taken these actions, compared to less than one-third of other types of organizations.

GreenStep Cities, on average, took more actions to increase resiliency than survey respondents as a whole, and more than organizations that used at least one of the four identified resources. As noted in Appendix H, those organizations who had used a resource took an average of 2.7 actions, and those who had not used a resource took an average of 1.1 actions. By comparison, GreenStep Cities took an average of 3.4 actions.

**Figure 28. Actions taken**

| In the past three years, what actions that you are aware of has your organization taken to increase the resiliency of the community or environment? Check all that apply. | Non-GreenStep Cities<br>(n=315) |     | GreenStep Cities<br>(n=43) |     | compare |
|---|---------------------------------|-----|----------------------------|-----|---------|
|   | #                               | %   | #                          | %   |         |
| Planted more community trees and/or more resilient tree species   | 93                              | 30% | 31                         | 72% |         |
| Improved the community's walkability, bikability, public gathering spaces, or pedestrian safety   | 87                              | 28% | 34                         | 79% |         |
| None that I am aware of   | 103                             | 33% | 2                          | 5%  |         |
| Upgraded built infrastructure to better address heavy/intense precipitation   | 71                              | 23% | 20                         | 47% |         |
| Installed (additional) green stormwater infrastructure or dual-purpose green space  | 47                              | 15% | 19                         | 44% |         |
| Installed renewable energy  | 29                              | 9%  | 18                         | 42% |         |
| Budgeted more funds for adaptive measures   | 24                              | 8%  | 5                          | 12% |         |
| Installed electric vehicle charging stations  | 16                              | 5%  | 9                          | 21% |         |
| Amended/implemented new ordinance(s) or policies for improved resilience  | 18                              | 6%  | 6                          | 14% |         |
| Other   | 16                              | 5%  | 3                          | 7%  |         |
| Taken action specifically to reduce risk(s) faced by the most climate-vulnerable populations in the community   | 6                               | 2%  | 0                          | 0%  |         |
| Powered electric vehicle charging stations with renewable energy  | 3                               | 1%  | 2                          | 5%  |         |
| Installed storage for renewable energy  | 2                               | 1%  | 1                          | 2%  |         |

## Helpful resources

The figure below shows the types of resources organizations identified as most helpful to make progress on climate adaptation and resilience. GreenStep Cities organizations more frequently selected all of the listed resources. More than half of the GreenStep Cities respondents selected all of the resources except “Resources and tools for planning and holding community engagement meetings.”

**Figure 29. Helpful resources**

| What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please check all that apply. | Non-GreenStep Cities<br>(n=315) |     | GreenStep Cities<br>(n=43) |     | compare |
|---|---------------------------------|-----|----------------------------|-----|---------|
|   | #                               | %   | #                          | %   |         |
| Financial assistance  | 163                             | 52% | 31                         | 72% |         |
| Best practices for climate adaptation and resilience  | 135                             | 43% | 30                         | 70% |         |
| Model policies or ordinances  | 132                             | 42% | 28                         | 65% |         |
| Planning toolkit and guides   | 129                             | 41% | 28                         | 65% |         |
| Educational materials for community outreach  | 116                             | 37% | 29                         | 67% |         |
| Model climate adaptation and resilience plans   | 108                             | 34% | 30                         | 70% |         |
| Local (downscaled) climate change projection data   | 110                             | 35% | 25                         | 58% |         |
| Training for organization staff   | 105                             | 33% | 23                         | 53% |         |
| Resources and tools for planning and holding community engagement meetings  | 42                              | 13% | 16                         | 37% |         |
| None of these   | 52                              | 17% | 0                          | 0%  |         |
| Other   | 4                               | 1%  | 1                          | 2%  |         |

## Organizations that hosted Minnesota GreenCorps members

The tables and charts below illustrate the responses of organizations that identified themselves as having hosted a Minnesota GreenCorps member and those who did not. In total, 38 organizations identified as having hosted a Minnesota GreenCorps member. The data below show these respondents compared to all other responding organizations. Responses are listed in the same order as they appear in the body of the report (sorted by highest proportion of responses in the whole data set).

## Planning activities

The figures below show the types of planning activities organizations who hosted a Minnesota GreenCorps member and those that did not. In general, organizations that had hosted a Minnesota GreenCorps member engage in more planning efforts than their counterparts. Two groups were most closely matched in water planning efforts—the majority of both groups had some type of water plan or planning effort.

**Figure 30. Overview of planning efforts**

|   | Non-GreenCorps Hosts<br>(n=320) |     | GreenCorps Hosts<br>(n=38) |     | % compare |
|---|---------------------------------|-----|----------------------------|-----|-----------|
|   | #                               | %   | #                          | %   |           |
| Has a comprehensive plan with relevant content in place or in process | 91                              | 28% | 16                         | 42% |           |
| Engaged in any standalone planning activity with relevant content     | 48                              | 15% | 11                         | 29% |           |
| Has relevant health and safety plans or planning efforts              | 155                             | 48% | 24                         | 63% |           |
| Has relevant water plans or planning efforts                          | 195                             | 61% | 25                         | 66% |           |
| Has relevant natural resource plans or planning efforts               | 97                              | 30% | 20                         | 53% |           |
| Has additional relevant plans or planning efforts                     | 114                             | 36% | 22                         | 58% |           |
| Organizations with any type of relevant plans or planning efforts     | 235                             | 73% | 32                         | 84% |           |

**Figure 31. Comprehensive planning**

| Does your organization have a comprehensive plan with content that specifically addresses climate adaptation and resilience? | Non-GreenCorps Hosts<br>(n=320) |     | GreenCorps Hosts<br>(n=38) |     | % compare |
|--|---------------------------------|-----|----------------------------|-----|-----------|
|  | #                               | %   | #                          | %   |           |
| None of the above  | 229                             | 72% | 22                         | 58% |           |
| Comprehensive Plan with this content <i>in process</i>   | 46                              | 14% | 11                         | 29% |           |
| Comprehensive Plan with this content <i>adopted</i>  | 37                              | 12% | 4                          | 11% |           |

**Figure 32. Standalone planning**

| Has your organization engaged in any of the following standalone planning efforts specifically to address climate adaptation and resilience? Please check all that apply. | Non-GreenCorps Hosts (n=320) |     | GreenCorps Hosts (n=38) |     | % compare |
|---|------------------------------|-----|-------------------------|-----|-----------|
|   | #                            | %   | #                       | %   |           |
| None of the above   | 272                          | 85% | 27                      | 71% |           |
| Strategic framework for climate adaptation/resilience <i>in process</i>   | 14                           | 4%  | 3                       | 8%  |           |
| Climate-vulnerable populations assessment completed   | 10                           | 3%  | 5                       | 13% |           |
| Climate adaptation plan in process  | 12                           | 4%  | 3                       | 8%  |           |
| Climate vulnerability assessment completed  | 10                           | 3%  | 4                       | 11% |           |
| Climate vulnerability assessment in process   | 10                           | 3%  | 2                       | 5%  |           |
| Strategic framework for climate adaptation/resilience completed   | 8                            | 3%  | 2                       | 5%  |           |
| Climate adaptation plan completed   | 7                            | 2%  | 1                       | 3%  |           |
| Climate-vulnerable populations assessment in process  | 3                            | 1%  | 1                       | 3%  |           |

**Figure 33. Health and safety planning**

| Does your organization have any health and safety plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-GreenCorps Hosts (n=320) |     | GreenCorps Hosts (n=38) |     | % compare |
|--|------------------------------|-----|-------------------------|-----|-----------|
|  | #                            | %   | #                       | %   |           |
| None of the above  | 165                          | 52% | 14                      | 37% |           |
| Emergency response   | 95                           | 30% | 13                      | 34% |           |
| Hazard mitigation  | 88                           | 28% | 17                      | 45% |           |
| Emergency operations   | 74                           | 23% | 11                      | 29% |           |
| Worker safety and work environment   | 51                           | 16% | 8                       | 21% |           |
| Building codes inspection and enforcement  | 37                           | 12% | 7                       | 18% |           |
| Continuity of operations   | 29                           | 9%  | 6                       | 16% |           |
| Public health  | 21                           | 7%  | 8                       | 21% |           |

**Figure 34. Water planning**

| Does your organization have any water plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-GreenCorps Hosts<br>(n=320) |     | GreenCorps Hosts<br>(n=38) |     | % compare |
|--|---------------------------------|-----|----------------------------|-----|-----------|
|  | #                               | %   | #                          | %   |           |
| None of the above  | 125                             | 39% | 13                         | 34% |           |
| Wellhead protection  | 98                              | 31% | 7                          | 18% |           |
| Stormwater/erosion control   | 83                              | 26% | 20                         | 53% |           |
| Watershed  | 87                              | 27% | 13                         | 34% |           |
| Water quantity (including groundwater)   | 66                              | 21% | 15                         | 39% |           |
| Sewer system   | 51                              | 16% | 6                          | 16% |           |
| Water supply infrastructure  | 49                              | 15% | 7                          | 18% |           |
| Wastewater treatment facilities  | 36                              | 11% | 4                          | 11% |           |

**Figure 35. Natural resource planning**

| Does your organization have any natural resources plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-GreenCorps Hosts<br>(n=320) |     | GreenCorps Hosts<br>(n=38) |     | % compare |
|--|---------------------------------|-----|----------------------------|-----|-----------|
|  | #                               | %   | #                          | %   |           |
| None of the above  | 223                             | 70% | 18                         | 47% |           |
| Invasive species   | 42                              | 13% | 11                         | 29% |           |
| Parks and park facilities  | 30                              | 9%  | 6                          | 16% |           |
| Open/green space (excluding parks)   | 25                              | 8%  | 9                          | 24% |           |
| Urban and community forestry   | 16                              | 5%  | 10                         | 26% |           |
| Forest management  | 20                              | 6%  | 5                          | 13% |           |

**Figure 36. Additional planning**

| Has your organization engaged in any additional planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-GreenCorps Hosts (n=320) |     | GreenCorps Hosts (n=38) |     | % compare   |
|---|------------------------------|-----|-------------------------|-----|---|
|   | #                            | %   | #                       | %   |   |
| None of the above   | 206                          | 64% | 16                      | 42% |    |
| Land use  | 38                           | 12% | 7                       | 18% |    |
| Strategic planning  | 34                           | 11% | 8                       | 21% |    |
| Energy  | 30                           | 9%  | 10                      | 26% |    |
| Transportation/roads  | 23                           | 7%  | 7                       | 18% |    |
| Solid waste   | 16                           | 5%  | 6                       | 16% |    |
| Facilities and grounds  | 15                           | 5%  | 6                       | 16% |    |
| Capital budget  | 15                           | 5%  | 3                       | 8%  |    |
| Construction and demolition waste   | 9                            | 3%  | 3                       | 8%  |   |
| Economic development  | 9                            | 3%  | 3                       | 8%  |  |
| Workforce planning and development  | 7                            | 2%  | 3                       | 8%  |  |
| Hazardous waste   | 5                            | 2%  | 2                       | 5%  |  |

## Actions taken

The figure below shows the types of actions taken to increase resiliency. In general, GreenCorps hosts were more likely to have taken an action than other types of survey respondents. The largest differences were "Planted more community trees and/or more resilient tree species" and "Improved the community's walkability, bikability, public gathering spaces, or pedestrian safety;" over 60 percent of responding GreenCorps hosts had taken these actions, compared to less than one-third of other types of organizations.

GreenCorps host organizations, on average, took more actions to increase resiliency than survey respondents as a whole, and more than organizations that used at least one of the four identified resources. As noted in Appendix H, those organizations who had used a resource took an average of 2.7 actions, and those who had not used a resource took an average of 1.1 actions. By comparison, organizations that hosted a GreenCorps member took an average of 3.2 actions.

**Figure 37. Actions taken**

| In the past three years, what actions that you are aware of has your organization taken to increase the resiliency of the community or environment? Check all that apply. | Non-GreenCorps Hosts (n=320) |     | GreenCorps Hosts (n=38) |     | compare |
|---|------------------------------|-----|-------------------------|-----|---------|
|   | #                            | %   | #                       | %   |         |
| Planted more community trees and/or more resilient tree species   | 101                          | 32% | 23                      | 61% |         |
| Improved the community's walkability, bikability, public gathering spaces, or pedestrian safety   | 97                           | 30% | 24                      | 63% |         |
| None that I am aware of   | 100                          | 31% | 5                       | 13% |         |
| Upgraded built infrastructure to better address heavy/intense precipitation   | 75                           | 23% | 16                      | 42% |         |
| Installed (additional) green stormwater infrastructure or dual-purpose green space  | 50                           | 16% | 16                      | 42% |         |
| Installed renewable energy  | 30                           | 9%  | 17                      | 45% |         |
| Budgeted more funds for adaptive measures   | 23                           | 7%  | 6                       | 16% |         |
| Installed electric vehicle charging stations  | 16                           | 5%  | 9                       | 24% |         |
| Amended/implemented new ordinance(s) or policies for improved resilience  | 23                           | 7%  | 1                       | 3%  |         |
| Other   | 17                           | 5%  | 2                       | 5%  |         |
| Taken action specifically to reduce risk(s) faced by the most climate-vulnerable populations in the community   | 3                            | 1%  | 3                       | 8%  |         |
| Powered electric vehicle charging stations with renewable energy  | 0                            | 0%  | 5                       | 13% |         |
| Installed storage for renewable energy  | 2                            | 1%  | 1                       | 3%  |         |

## Helpful resources

The figure below shows the types of resources organizations identified as most helpful to make progress on climate adaptation and resilience. Organizations that had hosted a Minnesota GreenCorps member more frequently selected all of the listed resources. More than half of the organizations that had hosted a Minnesota GreenCorps member selected all of the resources except “Resources and tools for planning and holding community engagement meetings.”

**Figure 38. Helpful resources**

| What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please check all that apply. | Non-GreenCorps Hosts<br>(n=320) |     | GreenCorps Hosts<br>(n=38) |     | compare |
|---|---------------------------------|-----|----------------------------|-----|---------|
|   | #                               | %   | #                          | %   |         |
| Financial assistance  | 165                             | 52% | 29                         | 76% |         |
| Best practices for climate adaptation and resilience  | 142                             | 44% | 23                         | 61% |         |
| Model policies or ordinances  | 137                             | 43% | 23                         | 61% |         |
| Planning toolkit and guides   | 133                             | 42% | 24                         | 63% |         |
| Educational materials for community outreach  | 123                             | 38% | 22                         | 58% |         |
| Model climate adaptation and resilience plans   | 112                             | 35% | 26                         | 68% |         |
| Local (downscaled) climate change projection data   | 110                             | 34% | 25                         | 66% |         |
| Training for organization staff   | 104                             | 33% | 24                         | 63% |         |
| Resources and tools for planning and holding community engagement meetings  | 43                              | 13% | 15                         | 39% |         |
| None of these   | 51                              | 16% | 1                          | 3%  |         |
| Other   | 3                               | 1%  | 2                          | 5%  |         |

## 319 Water Grant Program recipients

The tables and charts below illustrate the responses of organizations that indicated they used the 319 Water Grant Program and those who did not. In total, 45 organizations indicated that they used the program. The data below show these respondents compared to all other responding organizations. Responses are listed in the same order as they appear in the body of the report (sorted by highest proportion of responses in the whole data set).

### Planning activities

The figures below show the types of planning activities for 319 Water Grant Program recipients and Non-319 Grant organizations. With the exception of health and safety planning, 319 Water Grant Program recipients engage in more planning efforts than their counter parts. The two groups were closely matched in the area of standalone planning, where relatively few of either types of organizations had engaged in these types of planning efforts.

**Figure 39. Overview of planning efforts**

|   | Non-319 Water Grant<br>(n=313) |     | 319 Water Grant<br>(n=45) |     | % compare |  |
|---|--------------------------------|-----|---------------------------|-----|-----------|--|
|   | #                              | %   | #                         | %   |           |  |
| Has a comprehensive plan with relevant content in place or in process | 80                             | 26% | 27                        | 60% |           |  |
| Engaged in any standalone planning activity with relevant content     | 51                             | 16% | 8                         | 18% |           |  |
| Has relevant health and safety plans or planning efforts              | 159                            | 51% | 20                        | 44% |           |  |
| Has relevant water plans or planning efforts                          | 185                            | 59% | 35                        | 78% |           |  |
| Has relevant natural resource plans or planning efforts               | 95                             | 30% | 22                        | 49% |           |  |
| Has additional relevant plans or planning efforts                     | 112                            | 36% | 24                        | 53% |           |  |
| Organizations with any type of relevant plans or planning efforts     | 105                            | 34% | 42                        | 93% |           |  |

**Figure 40. Comprehensive planning**

| Does your organization have a comprehensive plan with content that specifically addresses climate adaptation and resilience? | Non-319 Water Grant<br>(n=313) |     | 319 Water Grant<br>(n=45) |     | % compare |  |
|--|--------------------------------|-----|---------------------------|-----|-----------|--|
|  | #                              | %   | #                         | %   |           |  |
| None of the above  | 233                            | 74% | 18                        | 40% |           |  |
| Comprehensive Plan with this content <i>in process</i>   | 46                             | 15% | 11                        | 24% |           |  |
| Comprehensive Plan with this content <i>adopted</i>  | 26                             | 8%  | 15                        | 33% |           |  |

**Figure 41. Standalone planning**

| Has your organization engaged in any of the following standalone planning efforts specifically to address climate adaptation and resilience? Please check all that apply. | Non-319 Water Grant (n=313) |     | 319 Water Grant (n=45) |     | % compare |  |
|---|-----------------------------|-----|------------------------|-----|-----------|--|
|   | #                           | %   | #                      | %   |           |  |
| None of the above   | 262                         | 84% | 37                     | 82% |           |  |
| Strategic framework for climate adaptation/resilience <i>in process</i>   | 14                          | 4%  | 3                      | 7%  |           |  |
| Climate-vulnerable populations assessment completed   | 15                          | 5%  | 0                      | 0%  |           |  |
| Climate adaptation plan in process  | 12                          | 4%  | 3                      | 7%  |           |  |
| Climate vulnerability assessment completed  | 13                          | 4%  | 1                      | 2%  |           |  |
| Climate vulnerability assessment in process   | 11                          | 4%  | 1                      | 2%  |           |  |
| Strategic framework for climate adaptation/resilience completed   | 6                           | 2%  | 4                      | 9%  |           |  |
| Climate adaptation plan completed   | 6                           | 2%  | 2                      | 4%  |           |  |
| Climate-vulnerable populations assessment in process  | 3                           | 1%  | 1                      | 2%  |           |  |

**Figure 42. Health and safety planning**

| Does your organization have any health and safety plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-319 Water Grant (n=313) |     | 319 Water Grant (n=45) |     | % compare |  |
|--|-----------------------------|-----|------------------------|-----|-----------|--|
|  | #                           | %   | #                      | %   |           |  |
| None of the above  | 154                         | 49% | 25                     | 56% |           |  |
| Emergency response   | 97                          | 31% | 11                     | 24% |           |  |
| Hazard mitigation  | 95                          | 30% | 10                     | 22% |           |  |
| Emergency operations   | 77                          | 25% | 8                      | 18% |           |  |
| Worker safety and work environment   | 50                          | 16% | 9                      | 20% |           |  |
| Building codes inspection and enforcement  | 40                          | 13% | 4                      | 9%  |           |  |
| Continuity of operations   | 32                          | 10% | 3                      | 7%  |           |  |
| Public health  | 24                          | 8%  | 5                      | 11% |           |  |

**Figure 43. Water planning**

| Does your organization have any water plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-319 Water Grant (n=313) |     | 319 Water Grant (n=45) |     | % compare |
|--|-----------------------------|-----|------------------------|-----|-----------|
|  | #                           | %   | #                      | %   |           |
| None of the above  | 128                         | 41% | 10                     | 22% |           |
| Wellhead protection  | 90                          | 29% | 15                     | 33% |           |
| Stormwater/erosion control   | 80                          | 26% | 23                     | 51% |           |
| Watershed  | 67                          | 21% | 33                     | 73% |           |
| Water quantity (including groundwater)   | 59                          | 19% | 22                     | 49% |           |
| Sewer system   | 53                          | 17% | 4                      | 9%  |           |
| Water supply infrastructure  | 49                          | 16% | 7                      | 16% |           |
| Wastewater treatment facilities  | 37                          | 12% | 3                      | 7%  |           |

**Figure 44. Natural resource planning**

| Does your organization have any natural resources plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-319 Water Grant (n=313) |     | 319 Water Grant (n=45) |     | % compare |
|--|-----------------------------|-----|------------------------|-----|-----------|
|  | #                           | %   | #                      | %   |           |
| None of the above  | 218                         | 70% | 23                     | 51% |           |
| Invasive species   | 36                          | 12% | 17                     | 38% |           |
| Parks and park facilities  | 32                          | 10% | 4                      | 9%  |           |
| Open/green space (excluding parks)   | 25                          | 8%  | 9                      | 20% |           |
| Urban and community forestry   | 18                          | 6%  | 8                      | 18% |           |
| Forest management  | 17                          | 5%  | 8                      | 18% |           |

**Figure 45. Additional planning**

| Has your organization engaged in any additional planning efforts with content that specifically addresses climate adaptation and resilience? Please check all that apply. | Non-319 Water Grant (n=313) |     | 319 Water Grant (n=45) |     | % compare |
|---|-----------------------------|-----|------------------------|-----|-----------|
|   | #                           | %   | #                      | %   |           |
| None of the above   | 201                         | 64% | 21                     | 47% |           |
| Land use  | 32                          | 10% | 13                     | 29% |           |
| Strategic planning  | 32                          | 10% | 10                     | 22% |           |
| Energy  | 38                          | 12% | 2                      | 4%  |           |
| Transportation/roads  | 27                          | 9%  | 3                      | 7%  |           |
| Solid waste   | 19                          | 6%  | 3                      | 7%  |           |
| Facilities and grounds  | 20                          | 6%  | 1                      | 2%  |           |
| Capital budget  | 15                          | 5%  | 3                      | 7%  |           |
| Construction and demolition waste   | 9                           | 3%  | 3                      | 7%  |           |
| Economic development  | 12                          | 4%  | 0                      | 0%  |           |
| Workforce planning and development  | 8                           | 3%  | 2                      | 4%  |           |
| Hazardous waste   | 6                           | 2%  | 1                      | 2%  |           |

## Actions taken

The figure below shows the types of actions taken to increase resiliency. In general, 319 Water Grant Program recipients were more likely to have taken an action than other organizations (the exception is “Improved the community’s walkability, bikability, public gathering spaces, or pedestrian safety,” which was selected by more organizations that did not use the program). The largest differences between organizations were “Installed (additional) green stormwater infrastructure or dual-purpose green space,” “Planted more community trees and/or more resilient tree species,” and “Budgeted more funds for adaptive measures.”

On average, 319 Water Grant Program organizations, took more actions to increase resiliency than survey respondents as a whole. As noted in Appendix H, those organizations who had used a resource took an average of 2.7 actions, and those who had not used a resource took an average of 1.1 actions. By comparison, organizations that used the 319 Water Grant Program took an average of 2.2 actions.

**Figure 46. Actions taken**

| In the past three years, what actions that you are aware of has your organization taken to increase the resiliency of the community or environment? Check all that apply. | Non-319 Water Grant (n=313) |     | 319 Water Grant (n=45) |     | compare |
|---|-----------------------------|-----|------------------------|-----|---------|
|   | #                           | %   | #                      | %   |         |
| Planted more community trees and/or more resilient tree species   | 102                         | 33% | 22                     | 49% |         |
| Improved the community’s walkability, bikability, public gathering spaces, or pedestrian safety   | 111                         | 35% | 10                     | 22% |         |
| None that I am aware of   | 104                         | 33% | 1                      | 2%  |         |
| Upgraded built infrastructure to better address heavy/intense precipitation   | 76                          | 24% | 15                     | 33% |         |
| Installed (additional) green stormwater infrastructure or dual-purpose green space  | 48                          | 15% | 18                     | 40% |         |
| Installed renewable energy  | 39                          | 12% | 8                      | 18% |         |
| Budgeted more funds for adaptive measures   | 19                          | 6%  | 10                     | 22% |         |
| Installed electric vehicle charging stations  | 22                          | 7%  | 3                      | 7%  |         |
| Amended/implemented new ordinance(s) or policies for improved resilience  | 19                          | 6%  | 5                      | 11% |         |
| Other   | 16                          | 5%  | 3                      | 7%  |         |
| Taken action specifically to reduce risk(s) faced by the most climate-vulnerable populations in the community   | 4                           | 1%  | 2                      | 4%  |         |
| Powered electric vehicle charging stations with renewable energy  | 4                           | 1%  | 1                      | 2%  |         |
| Installed storage for renewable energy  | 2                           | 1%  | 1                      | 2%  |         |

## Helpful resources

The figure below shows the types of resources organizations identified as most helpful to make progress on climate adaptation and resilience. Organizations that used the 319 Water Grant Program more frequently selected almost all of the listed resources (the exceptions were “Model policies or ordinances” and “Planning toolkit and guides”). Over 60 percent of 319 Water Grant Program recipients selected “Financial assistance,” “Best practices for climate adaptation and resilience” and “Educational materials for community outreach.”

**Figure 47. Helpful resources**

| What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please check all that apply. | Non-319 Water Grant (n=313) |     | 319 Water Grant (n=45) |     | compare |
|---|-----------------------------|-----|------------------------|-----|---------|
|   | #                           | %   | #                      | %   |         |
| Financial assistance  | 160                         | 51% | 34                     | 76% |         |
| Best practices for climate adaptation and resilience  | 135                         | 43% | 30                     | 67% |         |
| Model policies or ordinances  | 141                         | 45% | 19                     | 42% |         |
| Planning toolkit and guides   | 138                         | 44% | 19                     | 42% |         |
| Educational materials for community outreach  | 116                         | 37% | 29                     | 64% |         |
| Model climate adaptation and resilience plans   | 117                         | 37% | 21                     | 47% |         |
| Local (downscaled) climate change projection data   | 110                         | 35% | 25                     | 56% |         |
| Training for organization staff   | 106                         | 34% | 22                     | 49% |         |
| Resources and tools for planning and holding community engagement meetings  | 47                          | 15% | 11                     | 24% |         |
| None of these   | 49                          | 16% | 3                      | 7%  |         |
| Other   | 4                           | 1%  | 1                      | 2%  |         |