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# Climate Adaptation and Resilience Planning Survey

Minnesota Pollution Control Agency  
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# Executive summary

## Background

The Minnesota Pollution Control Agency (MPCA) is committed to supporting climate adaptation and resilience planning statewide. To better understand the needs of governmental entities planning and preparing for the impacts of the changing climate, MPCA asked Management Analysis and Development (MAD) to develop, administer, and analyze an online survey of governmental entities. Respondents included Minnesota cities, townships, counties, watershed districts, soil and water conservation districts, and regional development organizations, as well as tribal nations in the state.

MAD conducted the survey in 2016 and 2019, and replicated the effort in 2022 to assess progress and benchmark the current needs in relationship to new funding enacted at the state and federal levels specifically to support local climate resilience. MAD worked with experts from MPCA to update the survey each time.

The primary purposes of the survey were:

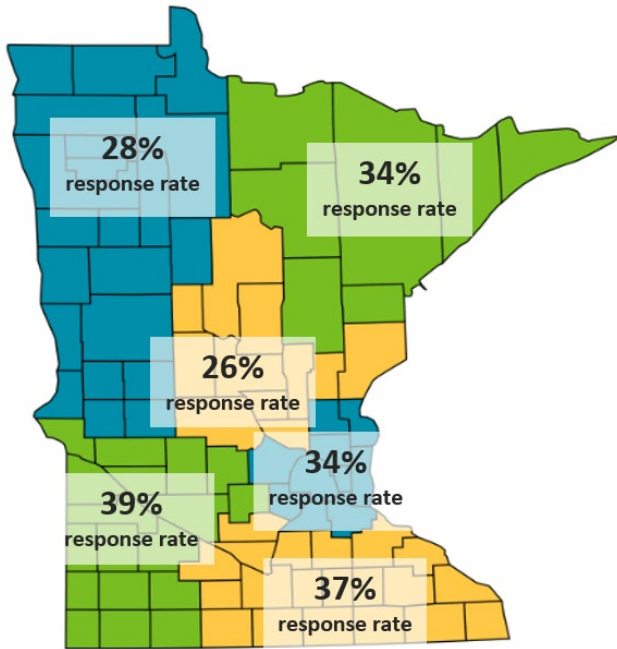
- Estimate the percentage of governmental agencies in Minnesota that have climate adaptation planning efforts, to serve as a statewide indicator.
- Learn more about climate adaptation and resilience planning efforts by governmental organizations in Minnesota.
- Learn about the climate adaptation actions 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.

## Response rate

This is the third statewide survey of climate adaptation and resilience planning in Minnesota. More than one thousand governmental entities—including Minnesota cities, townships, counties, tribal governments, watershed districts, soil and water conservation districts, and regional development organizations—received the 2022 survey, and about 33 percent responded (380 of 1,153).

The characteristics of responding organizations in 2022 generally reflected the characteristics of the organizations invited. The organizations that participated generally responded in proportion to the percentage of organizations invited in that category. For example, cities comprised 63 percent of all survey responses and 72 percent of survey invitations. Responding organizations also broadly reflected the regions of the state, as shown in Figure 1.

**Figure 1. 2022 data: Response rate by MPCA region**

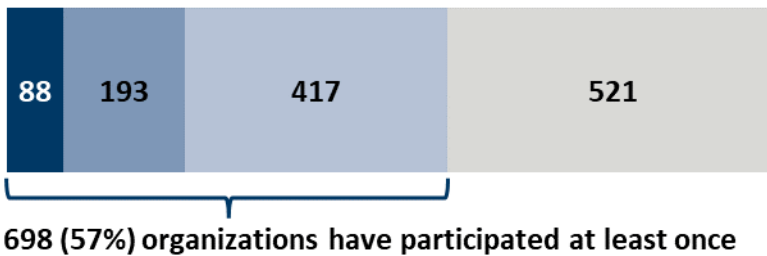


Over the three survey iterations, more than half of the organizations ever invited have participated at least once. Figure 2 shows that 57 percent of invited organizations (698 of 1,219) have responded one or more times, and 88 organizations have responded all three times.

**Figure 2. 2016–2022 data: Number of times organizations have participated in the survey**

**Organizations that have:**

- taken the survey 3 times
- 2 times
- 1 time
- never taken the survey



Analyzing the characteristics of all organizations that have ever responded or been invited shows that the survey has reached a wide variety of organizations around the state. For example, more than three-quarters of SWCDs, watershed districts/organizations, and tribal governments participated at least once in the three survey years. Cities and townships—the organization type with by far the highest number of invited organizations—had the lowest category response rate, but 51 percent of them still responded at least once. Additionally, more than half the organizations in most regions have participated at least once; only North Central received a regional response rate of just under 50 percent.

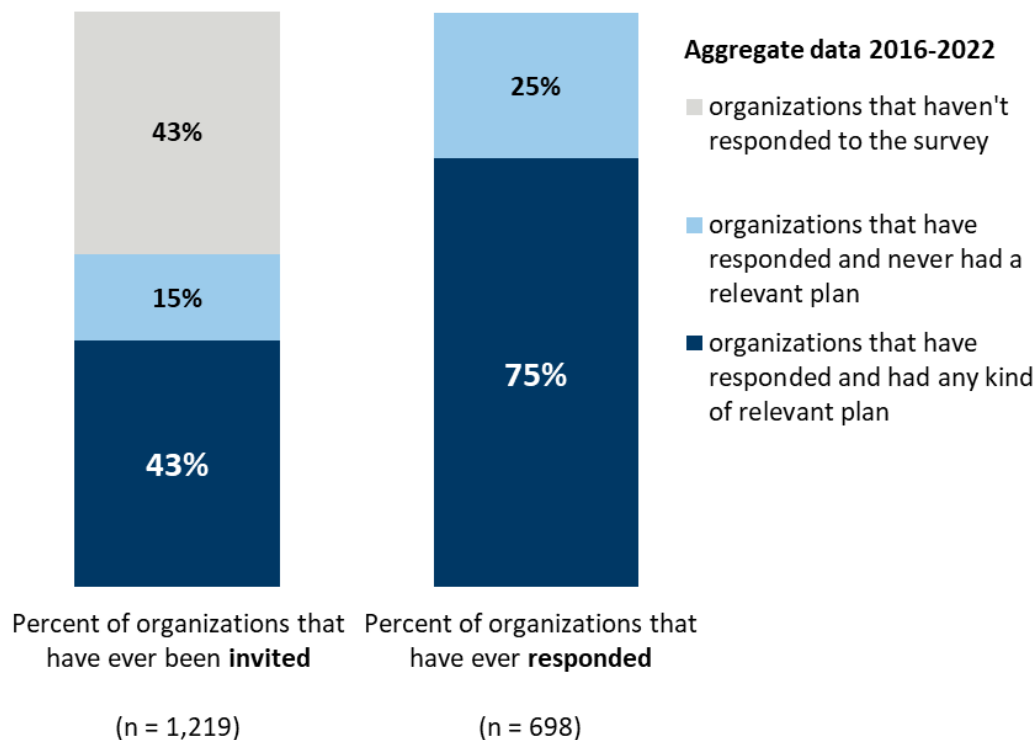
# Key findings

## Statewide indicator

Historically, reports for this survey have estimated the extent of statewide planning efforts by examining survey data in the context of all surveyed organizations in a given year. The new approach to calculating the indicator includes all three years of survey data—it expands the analysis from 33 percent of invited organizations in an individual year to 57 percent of organizations that have ever responded. Like the historical approach, it calculates the percentage for the statewide indicator based on the number of *invited* organizations, but it also includes an analysis showing percentages based on the number of *responding* organizations.

Figure 3 shows how many organizations have *ever* reported having different plan types in any of the three surveys. The bar on the left shows the aggregate data as a percentage of invited organizations, while the bar on the right shows the aggregate data as a percentage of responding organizations. Over the three survey years, 43 percent of *invited* organizations, and 75 percent of *responding* organizations, have participated in the survey and reported having a relevant planning effort or plan. Fifteen percent of *invited* organizations, and 25 percent of *responding* organizations, have participated in the survey and *never* reported a relevant plan.

**Figure 3. Governmental organizations in Minnesota that have ever reported having climate adaptation or resilience content in any survey, as a percentage of *responding* and *invited* organizations<sup>1</sup>**



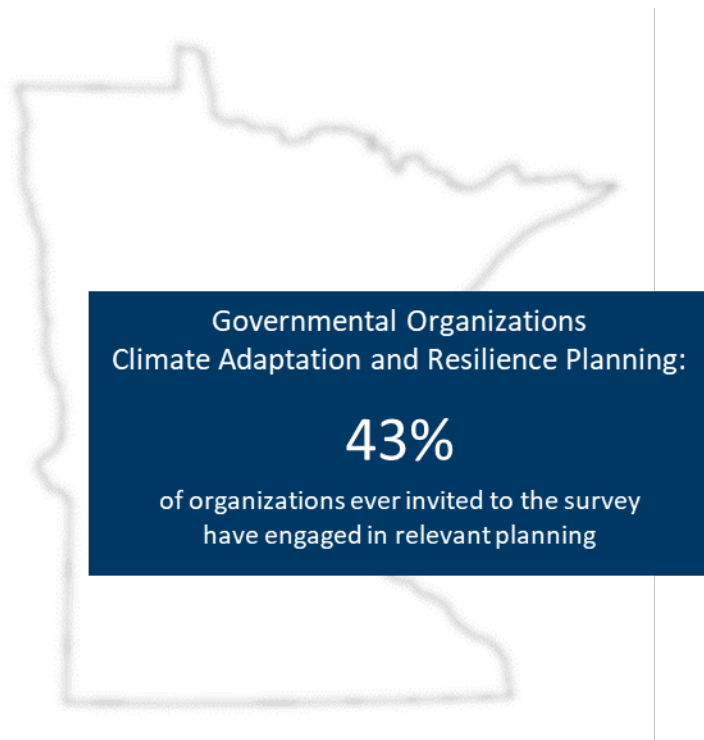
<sup>1</sup> A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any of the plan/planning types in survey questions about climate adaptation or resilience planning efforts. In a small number of cases, MAD designated a respondent as being engaged in planning based on their written comments. Organizations were not counted multiple times.



Studying the aggregate data provides a more accurate estimate of how many governmental organizations have engaged in this type of planning. The historical approach of looking at each year’s results separately and not including participation in past surveys likely underestimated how many organizations have relevant plans. An organization might have responded in 2019 that they had one or more relevant plans, but then not taken the survey again in 2022. However, the organizations’ previously reported plan(s) likely are still in use.

The new methodology looks at percentages for both invited organizations and responding organizations, but the indicator continues to be based on invited organizations for now. While respondents in each of the survey years have generally reflected the geography and organization types of all invited organizations (as discussed in the aggregate response rate section on page 17), it is still difficult to firmly conclude that responding organizations truly reflect the plans and planning efforts of all invited organizations.

**Figure 4. Statewide indicator of climate adaptation and resilience**

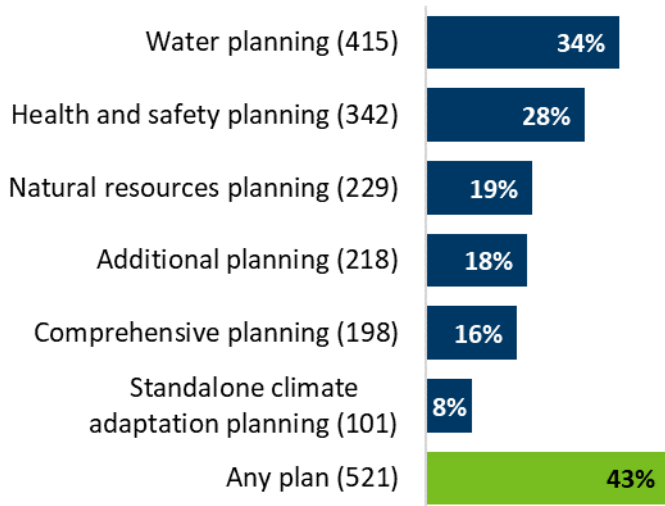


As additional organizations participate in future surveys, the aggregated responses are even more likely to reflect actual overall planning by all invited organizations.

## **Respondents’ planning**

Responding governmental organizations are engaged in a wide range of planning efforts. Figure 5 shows that, based on the results of all three surveys, organizations most often have water or health and safety plans that specifically address climate adaptation and resilience in some way.

**Figure 5. Aggregate 2016–2022 data: Organizations that have climate adaptation or resilience content in different plan types, as a percentage of invited organizations (n = 1,219)**



Looking at the 2022 survey results alone, 75 percent of organizations that responded have at least one type of relevant plan. On average, organizations selected 4.4 of the 36 planning options listed. Relatively few are engaged in many different types of plans or planning efforts related to climate adaptation and resilience.

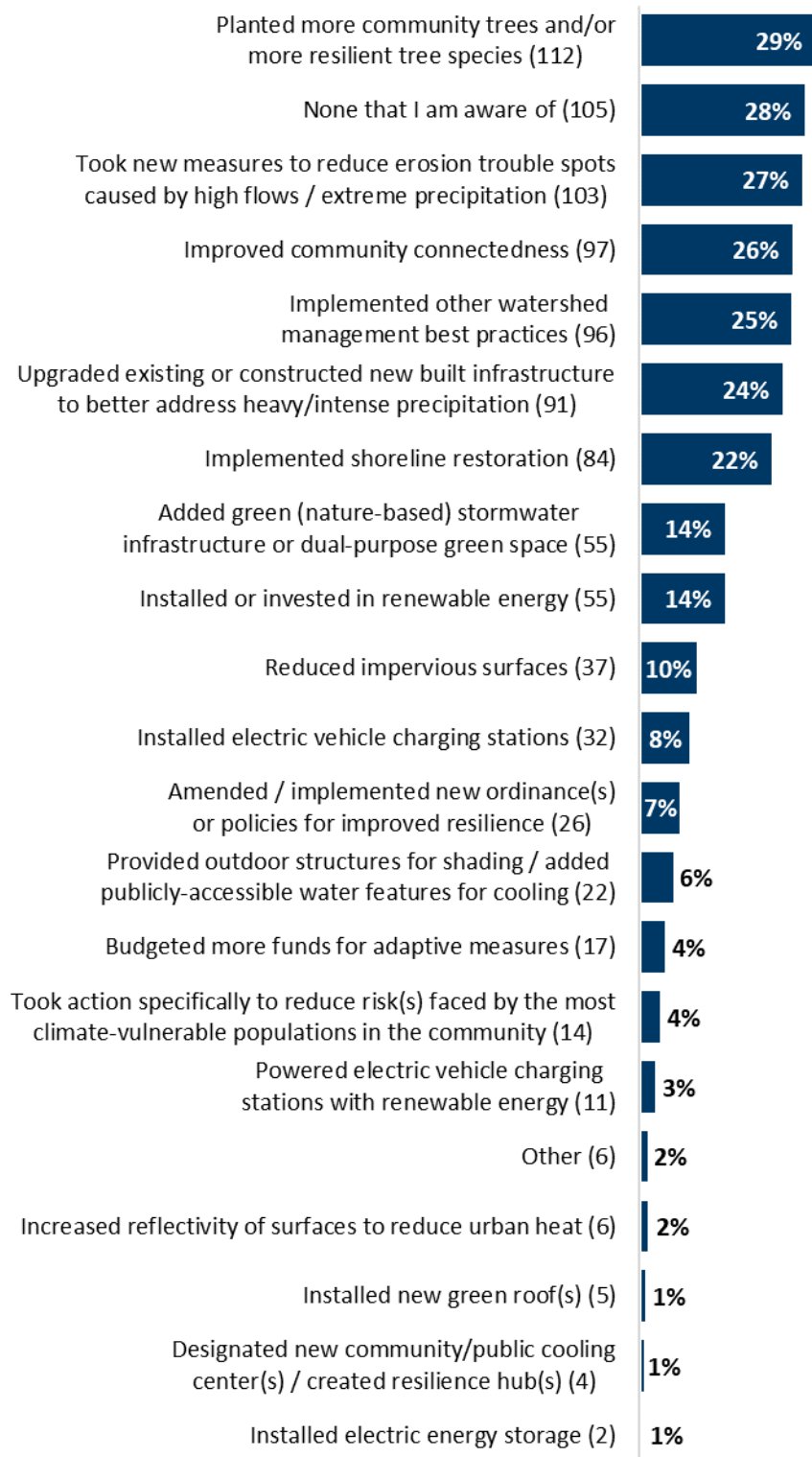
Other specific 2022 survey results regarding planning include:

- More than half of responding organizations (59 percent) are engaged in water plans or planning efforts with climate adaptation and resilience content.
- About 41 percent of responding organizations indicated they are engaged in health and safety planning efforts that include content on climate adaptation and resilience.
- Relatively few responding organizations (12 percent) are engaged in standalone climate adaptation planning efforts.
- About one-fifth of respondents had coordinated with other governmental organizations within Minnesota on climate adaptation and resilience planning or implementation.

## Respondents' actions

When asked about actions their organizations have taken in the past three years to increase resilience in their community or environment, 69 percent of 2022 respondents selected at least one listed action. Figure 6 shows respondents most often said their organizations have planted more community trees and/or more resilient tree species (29 percent). Only 14 percent of respondents who selected an action said the steps their organizations have taken were a direct result of a written plan that addressed climate adaptation and resilience.

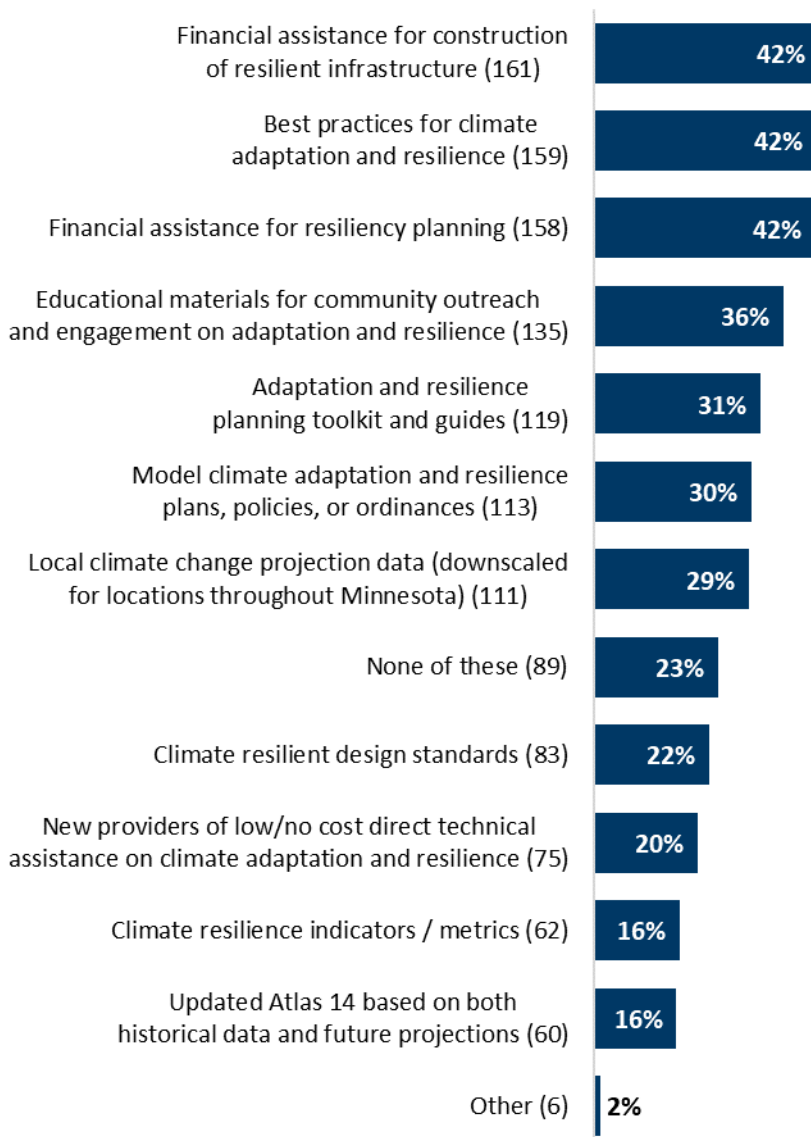
**Figure 6. 2022 survey data: In the past three (3) years, what actions has your organization taken to adapt/increase the resiliency of the community or environment to our changing climate? Please select all that apply. (This list focuses on tangible actions. We'll ask in later questions about any planning or assessments your organization has completed.)**



## Resources and assistance needed

Responding organizations in 2022 provided input on the types of resources or assistance that would be helpful to their organization for climate adaptation and resilience planning. The most popular options involved financial assistance for construction, financial assistance for planning, and best practices for climate adaptation and resilience (42 percent each).

**Figure 7. 2022 survey data: What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please select all that apply.**



## 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 in 2022 (87 percent) selected at least one option. Respondents most often selected extreme rainfall and storms (54 percent), representing a decrease from 65 percent in 2019. The options that had the largest increases from 2019 were increased air quality problems (28 percent, up from 22 percent) and more frequent wildfires (7 percent, up from 3 percent). Organizations that experienced one or more climate-related events or trends identified plans or planning activities far more frequently 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 the MPCA 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.

**Coordinate survey metrics and strategies with Minnesota's Climate Action Framework:** Future versions of this survey should align with the framework MPCA is developing to achieve a carbon-neutral, resilient, and equitable future for Minnesotans.

**Continue with planned survey timing:** MAD continues to recommend that the MPCA conduct the survey on a roughly 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.

**Add or expand on questions, but use restraint:** MAD recommends that the MPCA consider adding or refining questions or topics to address certain issues (such as exploring why organizations are not engaged in planning). Detailed recommendations are on page 43.

**Consider how and whether to include townships:** Nearly 60 townships were invited to participate in this survey because they were included in the list of cities obtained from the League of Minnesota Cities. However, the Minnesota Association of Townships estimates that the state has 1,780 townships, meaning only a small fraction of them were invited to take the survey. In the next survey, the MPCA could continue the practice from the 2016 and 2019 surveys of inviting only cities and not townships, or it could consider inviting all townships.

**Continue to explore cumulative results:** Analyzing the results of individual surveys is necessary and helpful to understand snapshots in time. It is also the best approach for questions that focus on events and planning work since the previous survey iteration. However, MAD recommends continuing to calculate cumulative results across all survey years. These analyses provide better estimates of the indicators than single-year results.

**Use the survey as an opportunity to educate:** On the question about resources and partnerships usage, only 16 percent 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. The MPCA could provide links to those programs in the survey to help agencies find existing resources.

# Background and methodology

The Minnesota Pollution Control Agency (MPCA) is committed to supporting climate adaptation and resilience planning statewide. To better understand the needs of governmental entities planning and preparing for the impacts of the changing climate, MPCA asked Management Analysis and Development (MAD) to develop, administer, and analyze an online survey of governmental entities. The survey was sent to Minnesota cities, townships, counties, watershed districts, soil and water conservation districts, and regional development organizations, as well as tribal nations in the state.

MAD completed the survey in 2016 and 2019, and replicated the effort in 2022 to track progress and benchmark the current needs in relationship to new funding enacted at the state and federal levels specifically to support local climate resilience. MAD worked with experts from MPCA to update the survey and conduct analyses that will be useful. A detailed description of survey methods is in Appendix A (page 45), and the full survey is in Appendix B (page 47).

The primary purposes of the survey were:

- Estimate the percentage of governmental agencies in Minnesota that have climate adaptation planning efforts, to serve as a statewide 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 from the MPCA Commissioner 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–M provide more detailed survey results for categories of respondents.

The graphs in the report typically show the proportion of responses based on the total number of survey respondents, not just the percentage of respondents who answered a particular question, unless otherwise noted. For many questions, totals may not equal 100 percent because respondents could select multiple options, or because not all respondents answered the question. For similar reasons, the sum of all responses to a particular question may be different than the total number of respondents.

## 2022 response rate

Overall, 380 organizations responded to the 2022 survey, representing 33 percent of all survey recipients. The 2022 response rate was the same as the 33 percent response rate in 2019. The 2016 survey response rate was 30 percent.

The characteristics of responding organizations in 2022 generally reflected the characteristics of the organizations invited. For example, the organizations that participated generally responded in proportion to the percentage of organizations invited in that category. Table 1 shows that cities comprised 63 percent of all survey responses and 72 percent of survey invitations. The representation of cities at 63 percent was an increase from 57 percent in 2019.

**Table 1. 2022 data: Responses by organization type**

Organization type	Responses	Response rate	Percent of survey responses	Percent of survey invitations
City	240	29%	63%	72%
Soil and water conservation district (SWCD)	48	55%	13%	8%
Town/township	30	46%	8%	6%
Watershed district/organization	30	48%	8%	5%
County	23	27%	6%	7%
Regional development organization/commission (RDC)	6	67%	2%	1%
Tribal government	3	30%	1%	1%

While cities made up most of the respondents, cities also had one of the lowest response rates for an organizational type (29 percent). It is worth noting that the vast majority of cities in Minnesota have populations of 5,000 or fewer.<sup>2</sup>

In addition to reflecting organization types, responding organizations also generally reflected the geography of invited organizations. As shown below in Table 2, Figure 8, and Figure 9, most regions had similar percentages of survey responses and survey invitations. The northeast region made up only 9 percent of invited and responding organizations, but it has fewer organizations than other regions; its regional response rate was similar to other regions’.

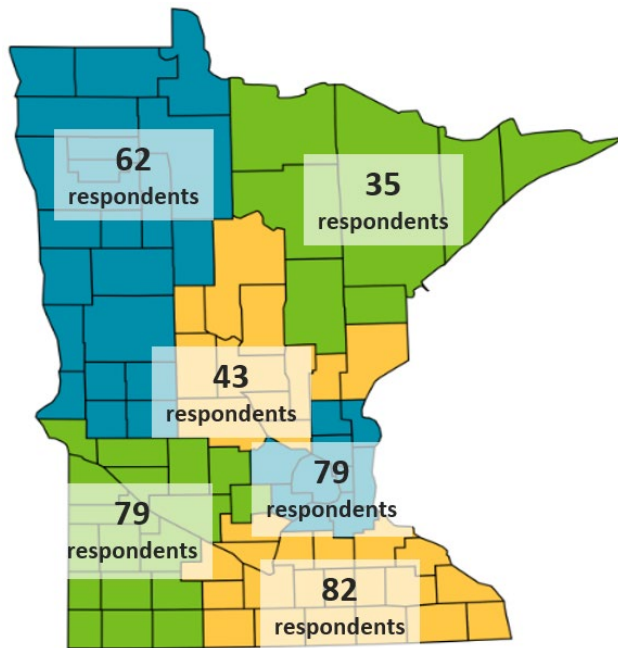
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<sup>2</sup> The League of Minnesota Cities provided a spreadsheet about its member cities. MAD primarily used the spreadsheet to obtain contact information for cities, but the spreadsheet also included population estimates for most cities. It is unclear from the spreadsheet where the estimates came from or how recent they are.

**Table 2. 2022 data: Responses by region**

MPCA region	Responses	Response rate	Percent of survey responses	Percent of survey invitations
Southeast	82	37%	22%	19%
Southwest	79	39%	21%	18%
Twin Cities Metro	79	34%	21%	20%
Northwest	62	28%	16%	19%
North Central	43	26%	11%	15%
Northeast	35	34%	9%	9%

**Figure 8. 2022 data: Responses by MPCA region**



**Figure 9. 2022 data: Response rate by MPCA region**

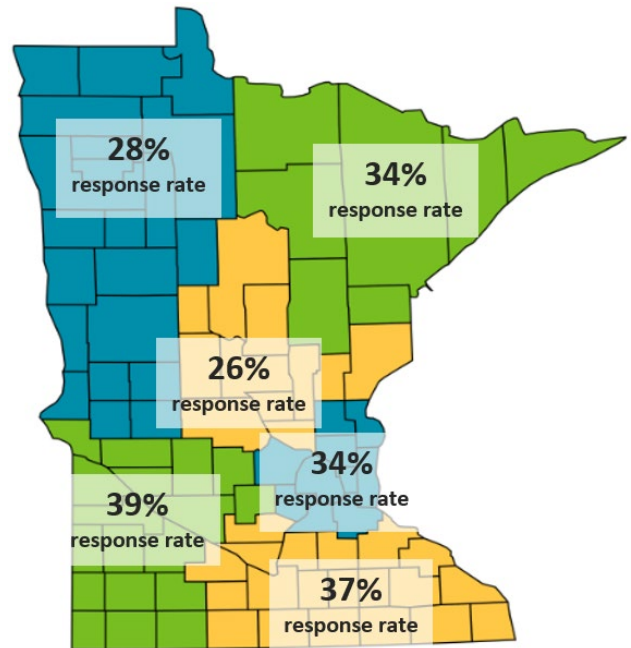


Table 3 below shows the 2022 distribution of responses by size of organization based on number of employees. The 2022 survey received a higher percentage of responses from organizations with 0–10 employees: 60 percent, up from 52 percent in 2019. Four percent of respondents did not answer this question.



**Table 3. 2022 data: Responses by organization size (employees) <sup>3</sup>**

Number of employees	Responses	Percent of survey responses
0–10	228	60%
11–50	63	17%
51–200	37	10%
201–500	22	6%
501–1,000	4	1%
over 1,000	9	2%

## Aggregate response rate

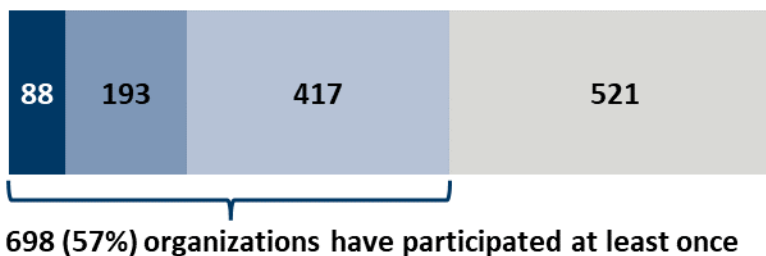
While only one-third of invited organizations participated in this survey, more than half of organizations that have ever been invited to take the survey have participated at least once. Over the three survey iterations, 1,219 organizations have been invited to participate. Not all organizations were invited each year; the 2022 survey invited some townships, for example, but did not invite state agencies that had previously been invited. Most organizations, though, have been invited to participate all three times.

Figure 10 shows that 88 organizations have responded to every version of the survey. Across all three surveys, 698 organizations, or 57 percent of invited organizations, have participated in the survey at least once.

**Figure 10. 2016–2022 data: Number of times organizations have participated in the survey**

Organizations that have:

■ taken the survey 3 times ■ 2 times ■ 1 time ■ never taken the survey



There was a notable amount of overlap between the two most recent surveys: of the 380 responding organizations in 2022, 41 percent also participated in the 2019 survey. As a result, the data from the three surveys can provide some organizational-level longitudinal data over six years. On the other hand, due to the

<sup>3</sup> While the previous two tables have a “percent of survey invitations” column, it is not possible to calculate that field for the “number of employees” characteristic. MAD only receives that characteristic information from responding organizations that answer the relevant survey question.

large percentage of first-time respondents, the 2022 data can also contribute to aggregate information that now exceeds a majority of invited governmental organizations.

Analyzing the characteristics of all organizations that have ever responded or been invited demonstrates that the survey has reached a majority of every type of governmental organization. Table 4 shows how many organizations of different types have responded or been invited. At the high end, nearly all state agencies invited participated in 2016 and/or 2019<sup>4</sup>, and more than three-quarters of SWCDs, watershed districts/organizations, and tribal governments participated at least once in the three survey years. Cities and townships—the organization type with by far the highest number of invited organizations—had the lowest category response rate, but 51 percent of them still responded at least once.

**Table 4. 2016–2022 data: Responses by organization type**

<b>Organization type</b>	<b># responded at least once</b>	<b># invited at least once</b>	<b>% in category ever responded</b>
City/township	472	923	51%
County	52	88	59%
RDC	6	9	67%
State agency	29	31	94%
SWCD	78	91	86%
Tribal government	9	12	75%
Watershed district/organization	52	65	80%

The aggregate responses also prove that the different MPCA regions have been well represented in survey results. Table 5 shows that more than half the organizations in all but one region have participated at least once; only North Central received a regional response rate of just under 50 percent. The two southern regions were most represented at more than 60 percent each. Taken together, these analyses show that participating organizations generally reflected the governmental type and regional representation of invited organizations.

**Table 5. 2016–2022 data: Responses by MPCA region**

<b>MPCA region</b>	<b># responded at least once</b>	<b># invited at least once</b>	<b>% in region ever responded</b>
Southwest	136	207	66%
Southeast	139	231	60%
Twin Cities Metro	137	244	56%
Northwest	119	226	53%
Northeast	55	108	51%
North Central	83	172	48%

<sup>4</sup> State agencies were not invited to participate in the 2022 survey.

# Statewide indicator of climate adaptation and resilience planning

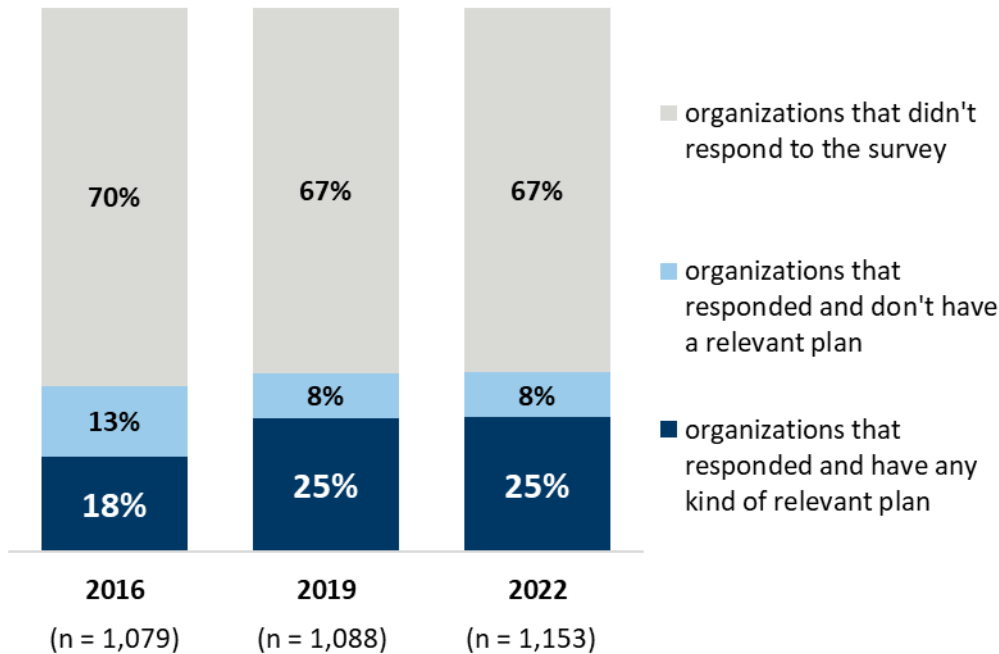
A primary purpose of this survey was to measure the statewide indicator of government planning efforts related to climate adaptation and resilience. MAD used one methodology for calculating the indicator in 2016 and 2019, but analyzing the aggregate data across all three years revealed the opportunity to rethink the methodology. This section presents the historical method and a new method of calculating the indicator. Appendix C on page 53 examines other ways MAD and the MPCA explored calculating a new indicator.

## Historical method: Look at each survey individually

Historically, reports for this survey have estimated the extent of statewide planning efforts by examining the data for each survey in the context of all organizations invited to participate in the survey that year. For the statewide indicator, MAD took the total number of responding organizations that indicated they were engaged in any type of planning efforts with content specifically related to climate adaptation or resilience (286 in 2022) and divided that by the total number of organizations invited to participate in the survey (1,153 in 2022). Using this approach, 25 percent of organizations invited to take the survey in 2022 reported that they have at least one plan or planning effort with content that specifically addresses climate adaptation and resilience.

Using this historical method, Figure 11 below shows the single-survey statewide indicator values for all three survey years. While the indicator increased to 25 percent in 2019 from 18 percent in 2016, the indicator stayed roughly flat from 2019 to 2022. One possible explanation for this may be the COVID-19 pandemic, which might have limited organizations' capacity to focus on climate adaptation and resilience. Another factor could be differences in the characteristics of organizations that responded to this survey compared with each of the previous iterations. The 2022 survey received relatively more responses from smaller organizations, which survey results show engage less often in this type of work.

**Figure 11. Governmental organizations in Minnesota that reported having climate adaptation or resilience content in each survey, as a percentage of *invited* organizations<sup>5</sup>**



## New method: Look at aggregate data

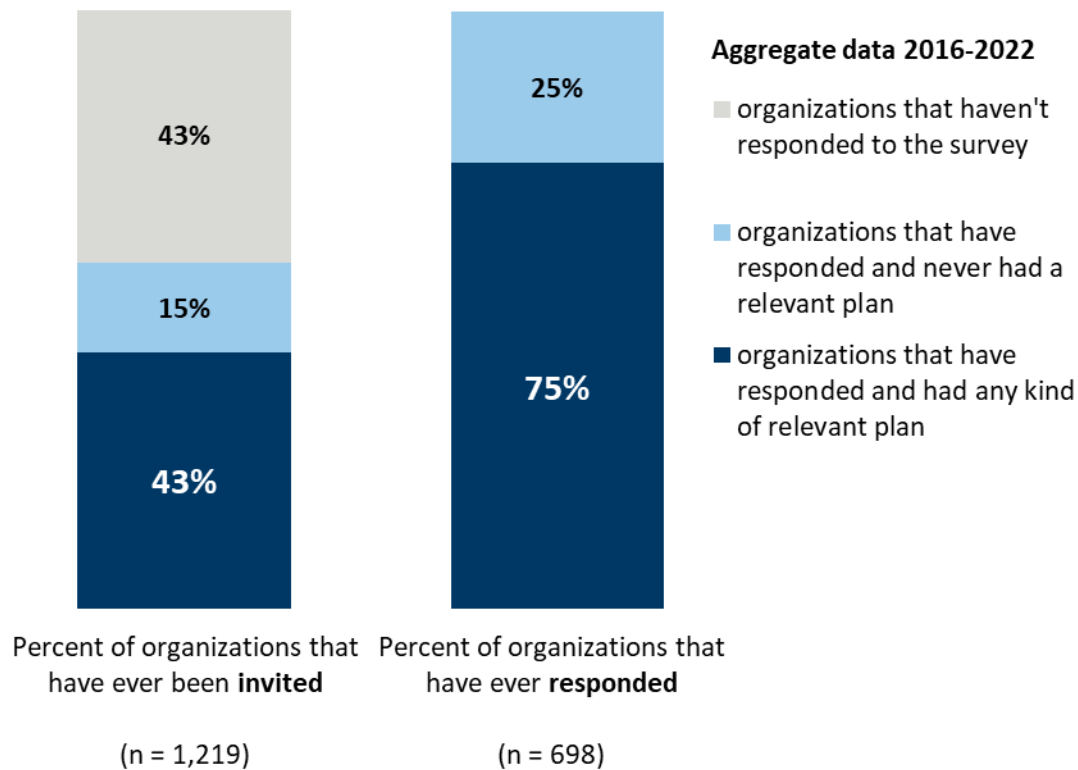
The new approach to determining the statewide indicator includes all three years of survey data—it expands the analysis from 33 percent of invited organizations in an individual year to 57 percent of organizations that have ever responded. Like the historical approach, it calculates the percentage for the statewide indicator based on the number of *invited* organizations. This approach avoids overestimating the amount of relevant planning by the governmental organizations targeted in the survey. On the other hand, this approach likely underestimates the actual percentage of governmental organizations with plans that address climate adaptation and resilience. For this reason, the new approach also includes an analysis of the aggregate data showing a percentage based on the number of *responding* organizations for additional context.

Figure 12 shows how many organizations have *ever* reported in any of the three surveys having one or more plans with content that specifically addresses climate adaptation and resilience. The bar on the left shows the aggregate data as a percentage of invited organizations as the indicator, while the bar on the right shows the aggregate data as a percentage of responding organizations to provide additional context. Over the three survey years, 43 percent of *invited* organizations, and 75 percent of *responding* organizations, have participated in the

<sup>5</sup> A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any of the plan/planning types in survey questions about climate adaptation or resilience planning efforts. In a small number of cases each year, MAD designated a respondent as being engaged in planning based on their written comments.

survey and reported having a relevant plan or planning effort. Fifteen percent of *invited* organizations, and 25 percent of *responding* organizations, have participated in the survey and *never* reported a relevant plan.

**Figure 12. Governmental organizations in Minnesota that have ever reported having climate adaptation or resilience content in any survey, as a percentage of *invited* and *responding* organizations<sup>6</sup>**



## Benefits of the new methodology

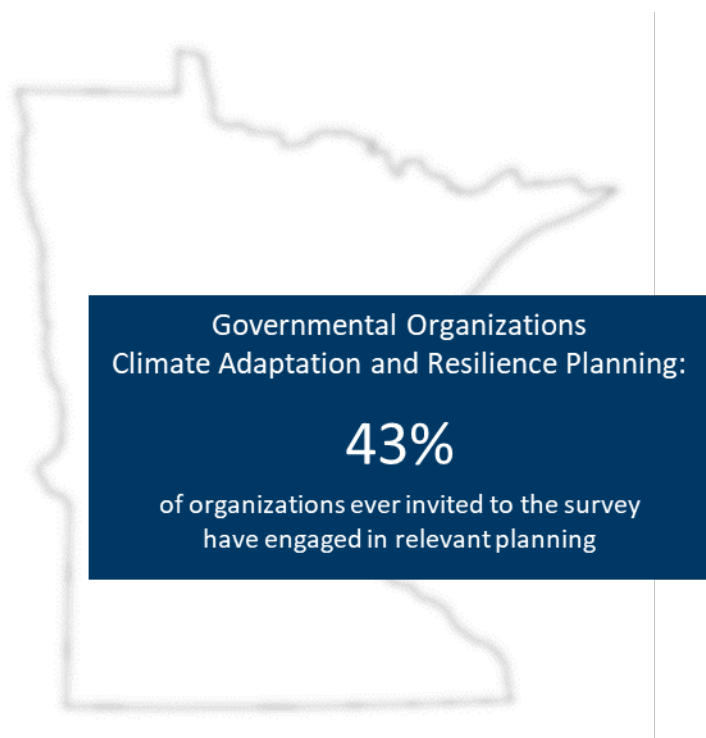
While the historical methodology made sense when there was more limited data, no individual survey has had more than 33 percent of invited organizations respond, meaning that any single-year analysis is a limited snapshot of how much relevant planning exists. A large percentage of the specific responding organizations has changed with each survey (as shown in Figure 9 on page 27), even though respondents overall continue to generally reflect the broad categories and regional distribution of invited organizations. Analyzing the aggregate data expands the analysis from 33 percent of invited organizations in an individual year to 57 percent of organizations that have ever responded. Studying the total available sample provides a more accurate estimate of how many governmental organizations have engaged in this type of planning.

<sup>6</sup> A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any of the plan/planning types in survey questions about climate adaptation or resilience planning efforts. In a small number of cases, MAD designated a respondent as being engaged in planning based on their written comments. Organizations were not counted multiple times.

Looking at each year’s results separately and not including historical participation by different organizations likely underestimates how many organizations have relevant plans. This is because the survey questions about planning are not time dependent; they do not ask about any new plans since the previous survey, but rather whether the organization *has* engaged in different types of planning. An organization might have responded in 2019 that they had one or more relevant plans, but then not taken the survey again in 2022. Only 41 percent of organizations that participated in 2022 also participated in 2019. Not including their data from the previous surveys almost certainly underestimates the amount of planning that actually exists, because the previously reported plan(s) likely are still in use. Studying the results of the 88 organizations that have taken the survey three times shows that they mostly increase their number of plans over time (see Appendix D on page 56).

The new methodology looks at percentages for both invited organizations and responding organizations, but the indicator continues to be based on invited organizations for now (see Figure 13). While respondents in each of the survey years have generally reflected the geography and organization types of all invited organizations (as discussed in the aggregate response rate section on page 17), it is still difficult to firmly conclude that responding organizations truly reflect the plans and planning efforts of all invited organizations. For example, a higher percentage of organizations that completed 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.

**Figure 13. Statewide indicator of climate adaptation and resilience**



Overall, the new indicator shows a more accurate estimate of how many governmental entities in Minnesota plan for climate adaptation and resilience. As additional organizations participate in future surveys, the aggregated responses are even more likely to reflect actual overall planning by all invited organizations.

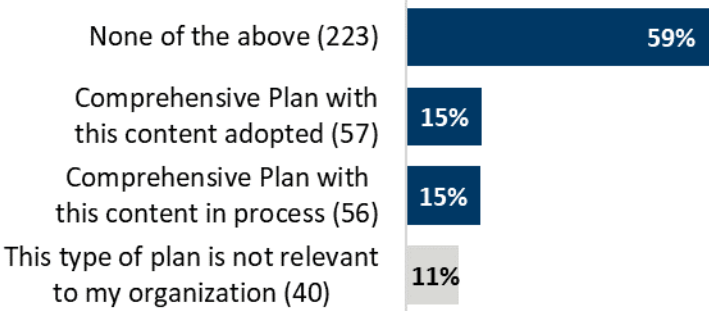
# Survey respondents' planning efforts

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.

## Comprehensive planning

In 2022, 15 percent of respondents said they had adopted a comprehensive plan with content that specifically addresses climate adaptation and resilience. Additionally, 15 percent reported being in the process of developing a comprehensive plan with this content. Figure 14 shows the full results.

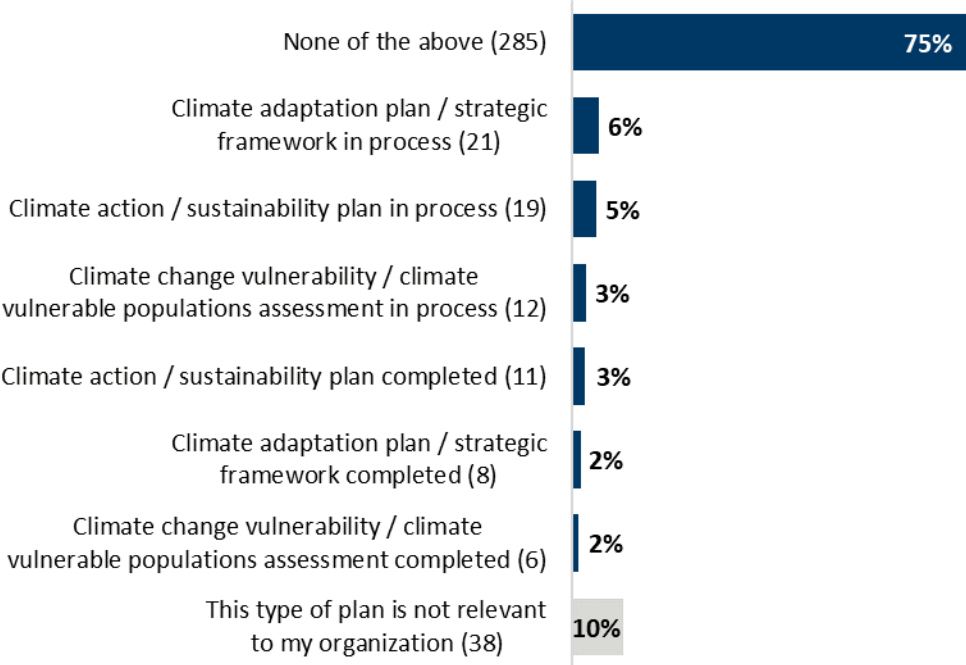
**Figure 14. 2022 survey data: Does your organization have a *comprehensive plan* with content that specifically addresses climate adaptation and resilience?**



# Standalone planning

Figure 15 shows that most 2022 respondents do not have standalone planning that specifically addresses climate adaptation and resilience. Of the options that affirmed they had some type of plan in process or completed, respondents most often indicated they have a climate adaptation plan/strategic framework in process (6 percent). The 2022 survey also offered a new option, Climate action/sustainability plan. Five percent of respondents have a climate action/sustainability plan in process, and 3 percent have one completed.

**Figure 15. 2022 survey data: Has your organization engaged in any of the following *standalone planning* efforts specifically to address climate adaptation and resilience? Please select all that apply.**

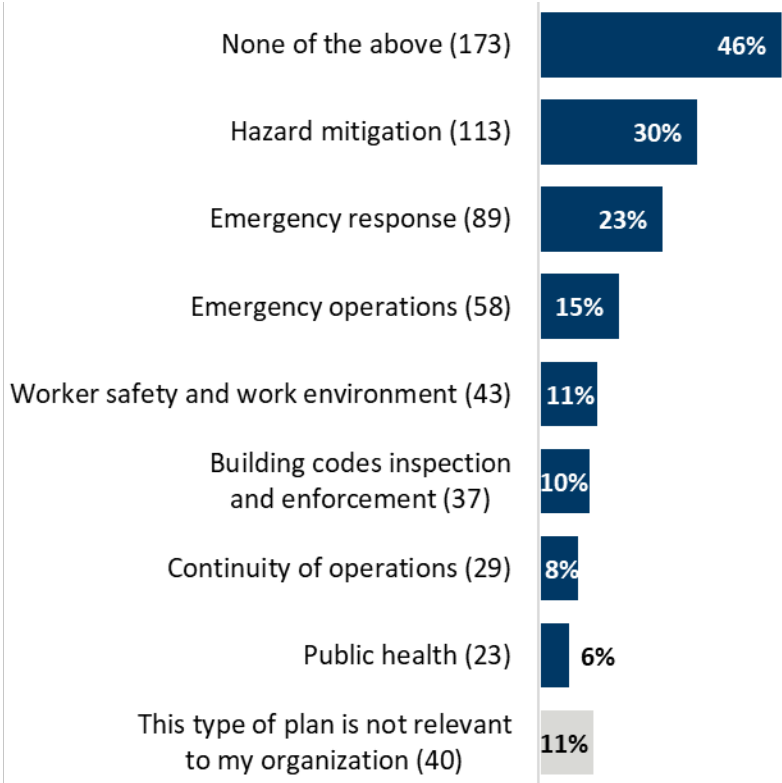




# Health and safety planning

Figure 16 shows that among health and safety plans, 2022 respondents most often have hazard mitigation plans (30 percent) and emergency response plans (23 percent) that contain relevant content.

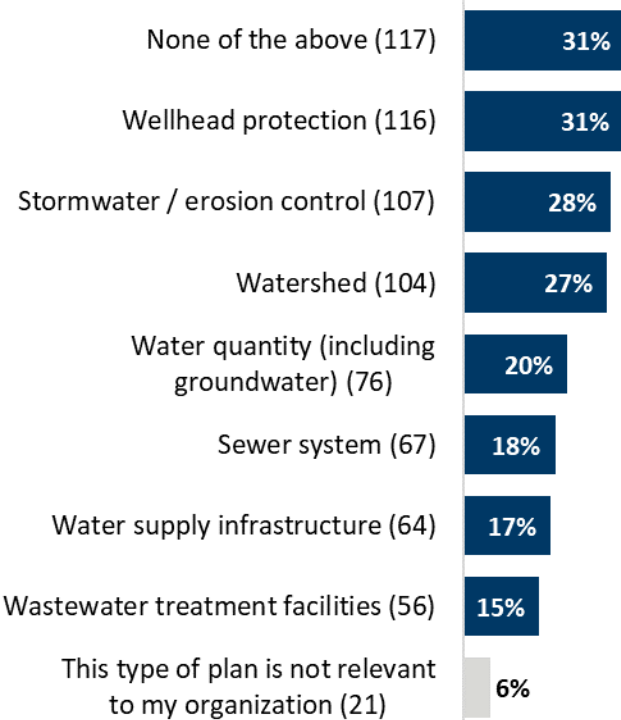
**Figure 16. 2022 survey data: Does your organization have any *health and safety plans* or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.**



# Water planning

Figure 17 shows how many respondents chose each of the different types of water plans in 2022. The three most common water plan types selected were wellhead protection (31 percent), stormwater (28 percent), and watershed (27 percent).

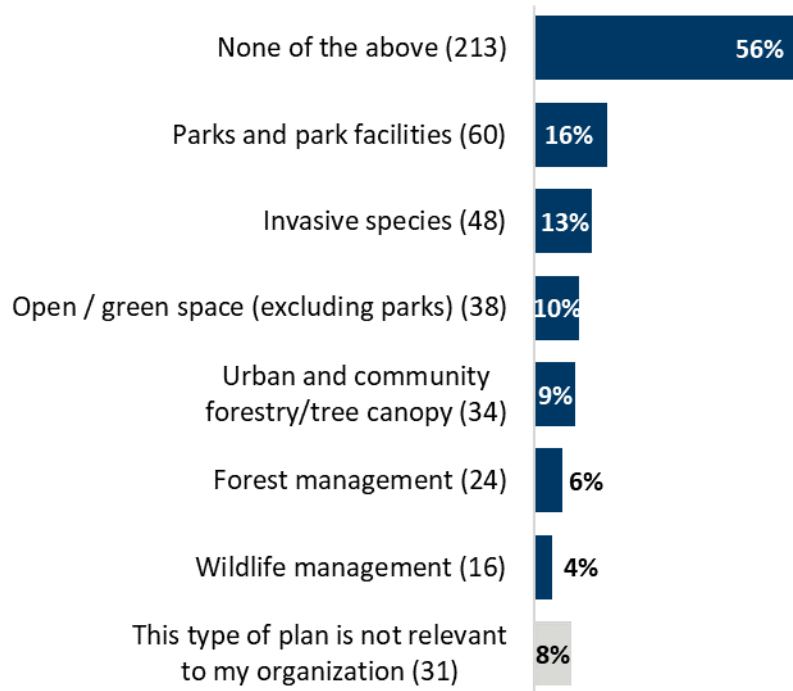
**Figure 17. Does your organization have any *water plans* or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.**



## Natural resources planning

In 2022, parks and facilities planning and invasive species planning remained the most common natural resources plans selected. Parks and facilities plans (16 percent) and invasive species plans (13 percent) were the most commonly selected options. The 2022 survey added a new option, Wildlife management, which 4 percent of respondents selected.

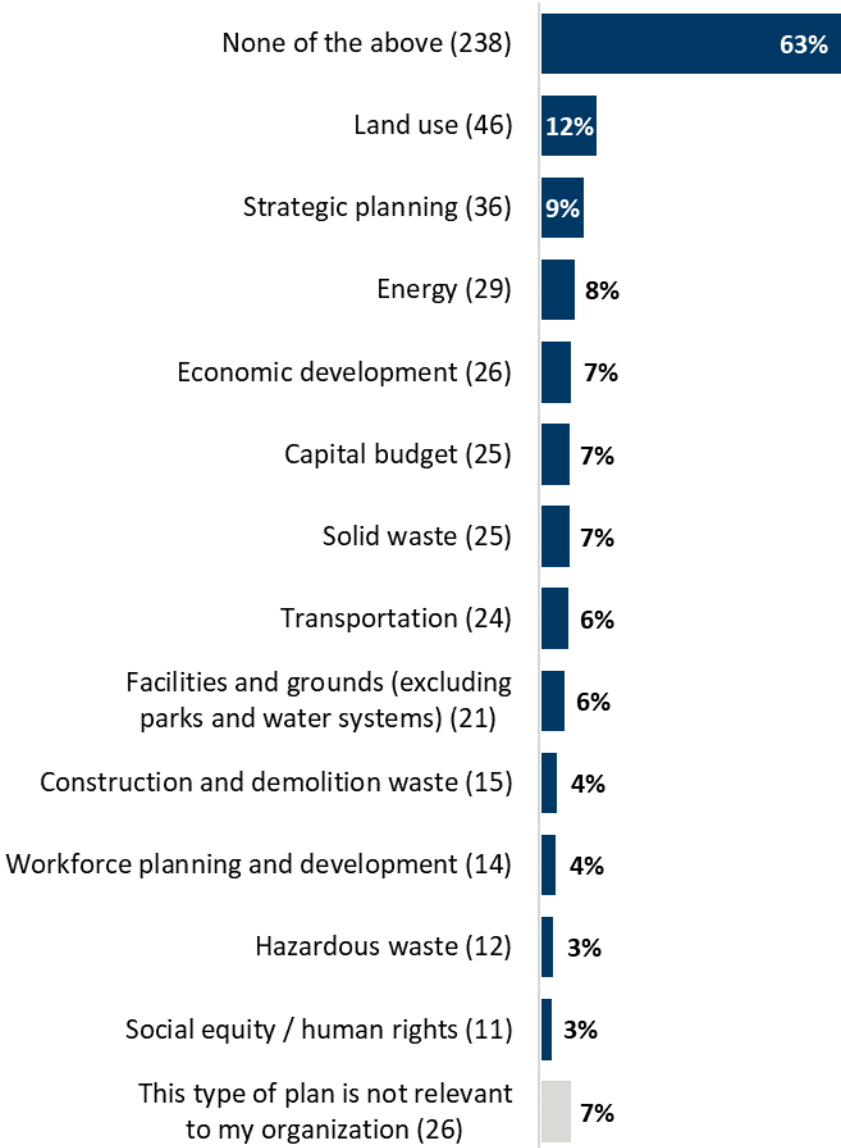
**Figure 18. Does your organization have any *natural resources* plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.**



# Additional planning efforts

One of the last planning questions asked whether organizations have engaged in specific types of additional planning efforts (not covered in previous categories) that specifically address climate adaptation and resilience. Land use and strategic planning were the most common selections for types of additional planning. The 2022 survey added a new option, Social equity/human rights, and 3 percent of respondents said they have engaged in this type of planning. Figure 19 details the 2022 results.

**Figure 19. Has your organization engaged in any *additional planning* efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.**



## Other types of planning

Another survey question asked respondents, “If your organization has engaged in any other planning not covered in any of the previous questions with content specifically related to climate adaptation and resilience, please describe it.” About 10 percent of survey respondents offered some comments (excluding responses like “none” or “not applicable”).

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:

- Applied for the Xcel Partners in Energy program.
- Began a carbon sequestration program development/evaluation.
- Created a committee to work with a seed legacy program.
- Completed wastewater and storm sewer projects to help address flooding issues.
- Assessed peatland restoration for its application in water quality and quantity management.

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

- Diversion plan of updating their infrastructure.
- Flood risk and resiliency analysis.
- Systems-based planning.

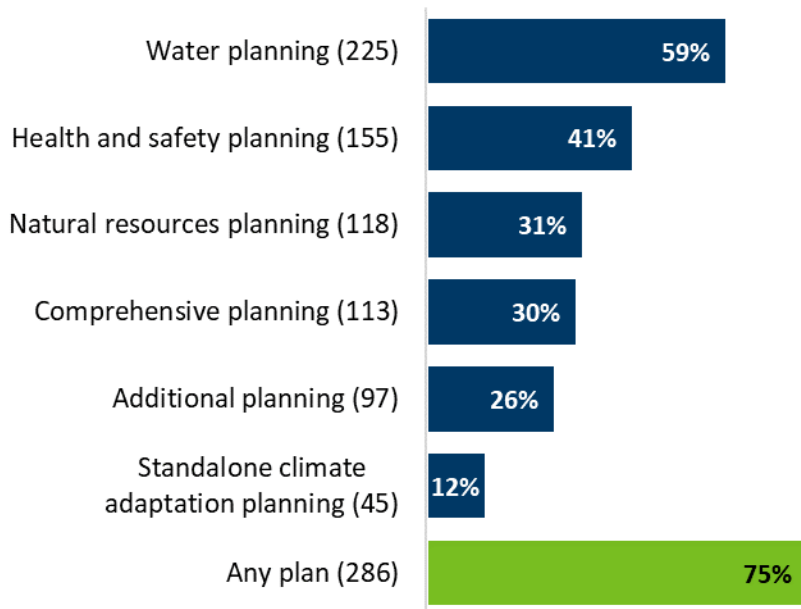
# A broader view of planning efforts

## Planning efforts by type of plan

Reviewing survey results by type of plan can provide a broader view of the survey respondents' planning efforts. Figure 18 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 were the second most common plan type.
- Similar percentages of respondents are engaged in natural resource and comprehensive planning.
- Relatively few responding organizations are engaged in standalone climate adaptation planning efforts.

**Figure 20. 2022 survey data: climate adaptation or resilience content in planning efforts by type of plan<sup>7</sup> (n = 380)**

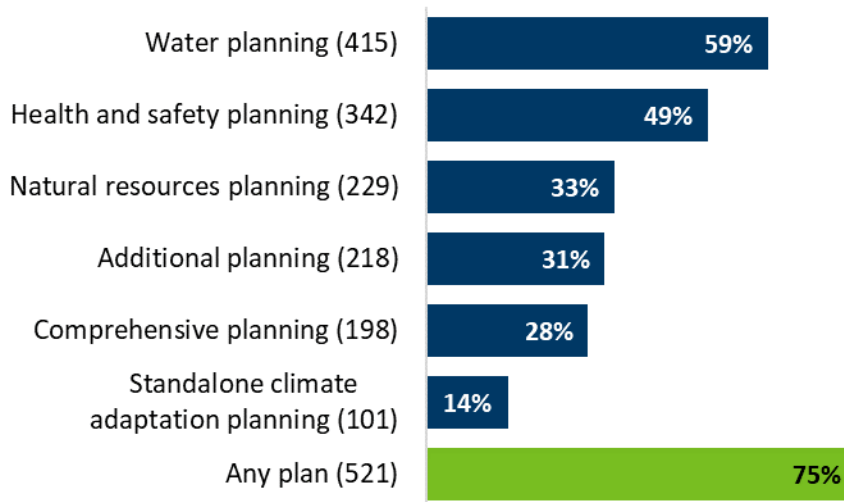


While Figure 20 explores the prevalence of planning types within the 2022 survey, it only shows a snapshot of governmental organizations that responded this year. Figure 21 examines how many organizations have ever

<sup>7</sup> A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any of the plan/planning types in survey questions about climate adaptation or resilience planning efforts. 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 sections.

reported having different plan types in any of the three surveys, as a percentage of all organizations that have ever taken the survey. Across survey iterations, 75 percent of responding organizations have reported having any kind of plan at least once. The most common types of plans have been water planning (59 percent of responding organizations over three surveys) and health and safety planning (49 percent of responding organizations over three surveys).

**Figure 21. Aggregate 2016–2022 data: organizations that have climate adaptation or resilience content in different plan types, as a percentage of *responding* organizations<sup>8</sup> (n = 698)**

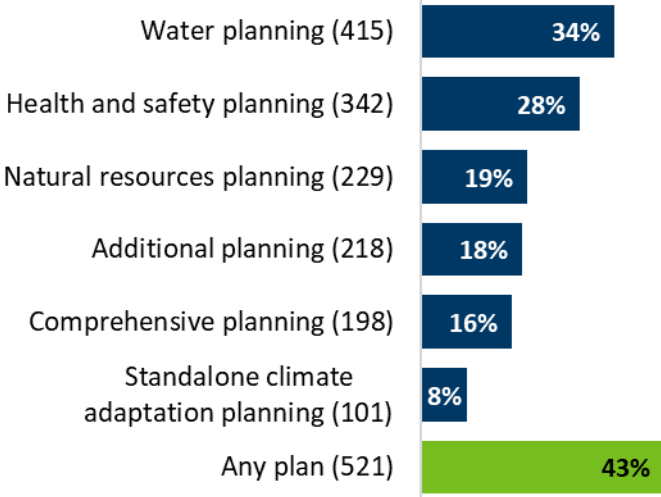


Comparing Figure 20 and Figure 21 shows that the 2022 survey results generally reflected the results of all organizations that have ever responded to the survey; the proportions of different plan types are very similar across the two figures.

Figure 22 recalculates the data from Figure 21 as a percentage of all organizations that have ever been invited to the survey. This reflects a more likely—but probably conservative—estimate of how many organizations in Minnesota have different types of plans. By this metric, 34 percent of governmental organizations have a water plan with relevant content, and 28 percent have a health and safety plan with relevant content.

<sup>8</sup> A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any of the plan/planning types in survey questions about climate adaptation or resilience planning efforts. Organizations were not counted multiple times. Among the three surveys, 698 unduplicated organizations have participated in the survey at least once.

**Figure 22. Aggregate 2016–2022 data: organizations that have climate adaptation or resilience content in different plan types, as a percentage of invited organizations (n = 1,219)**



**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 in 2022 could choose from a maximum of 36 options related to planning. The largest number of plans an individual respondent this year chose was 28, and the lowest was zero. On average, respondents selected 4.4 items, a slight decrease from an average of 4.6 in 2019.<sup>9</sup> The median number of planning efforts per organization was 3, the same as in 2019.

As shown in Table 6, larger organizations had a higher average and median number of plans. Small organizations with 10 or fewer employees averaged 3.7 plans, compared with 5.0 and 17.1, respectively, for organizations of 501–1,000 employees or over 1,000 employees.

**Table 6. 2022 survey data: Number of plans, by organization size**

Number of employees	Average number of plans	Median number of plans	Number of responses
0–10	3.7	2	228
11–50	3.5	2	63
51–200	7.1	6	37
201–500	6.1	6	22
501–1,000	5.0	4	4
over 1,000	17.1	15	9

<sup>9</sup> MAD counted all of the planning options selected by each respondent and then derived the average for all respondents.



It is worth noting that compared with past surveys, a higher percentage of 2022 respondents came from the smallest organizations: 60 percent of respondents were from organizations with 10 or fewer employees, compared with 52 percent in 2019. Because smaller organizations tend to have fewer types of plans than larger organizations, this shift in the respondent set may partially explain the slightly lower average number of plans picked.

The above results for the two largest categories of organizations show how difficult it can be to analyze small groups of respondents. The average number of plans reported by organizations with over 1,000 employees was substantially larger in 2022 (17.1 plans) than it was in 2019 (10.6 plans). However, only nine organizations identified as belonging to that category in 2022, compared with 17 in 2019. Similarly, the average number of plans reported by organizations of 501–1,000 employees decreased to 5.0 in 2022 from 9.3 in 2019. Again, though, only four organizations were in that category in 2022, and only six in 2019. With such small respondent counts, the numbers can vary widely depending on which particular organizations responded in a given year. The results for these groups should be interpreted cautiously.

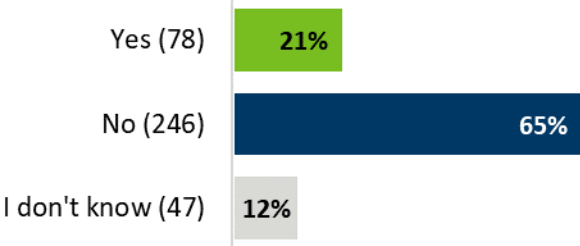
Overall, the responses suggest a wide range of planning efforts among surveyed organizations. The vast majority of responding organizations have plans or are engaged in planning efforts that specifically address climate adaptation and resilience. However, some governmental organizations in Minnesota are still not engaging in this work, and this survey has largely not explored the reasons why. The 2022 survey did add options for respondents to indicate that different types of plans were not relevant to their organization, but future surveys could explore additional reasons for not having plans through new questions.

# Other survey results

## Intergovernmental coordination

The 2022 survey introduced a new question about coordinating with other governments on climate adaptation and resilience planning or implementation. Figure 23 shows about one-fifth of respondents said they had coordinated with others, while nearly two-thirds said they had not. Appendix M on page 115 explores which types of organizations have coordinated with other governmental organizations.

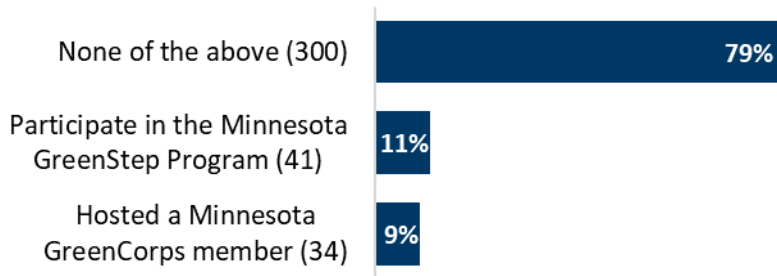
**Figure 23. 2022 survey data: Has your organization coordinated with any other local/regional/tribal governmental organization(s) within Minnesota on climate adaptation and resilience planning or implementation?**



## Utilized resources

Figure 24 shows that in 2022, 16 percent of respondents said they had used at least one of the listed resources or partnerships. The 2022 survey removed two options from the 2019 survey, leaving just two resource choices. About one-fifth of organizations had made use of the Minnesota GreenStep program (11 percent) and/or had hosted a Minnesota GreenCorps member (9 percent); 16 respondents selected both options. Appendix J on page 96 explores survey results based on whether respondents had used either of these resources. Appendix K on page 99 further examines survey results for respondents who participated in the Minnesota GreenStep Cities program and for respondents who hosted a Minnesota GreenCorps member.

**Figure 24. 2022 survey data: Has your organization made use of the following resources or partnerships? Please select all that apply.**

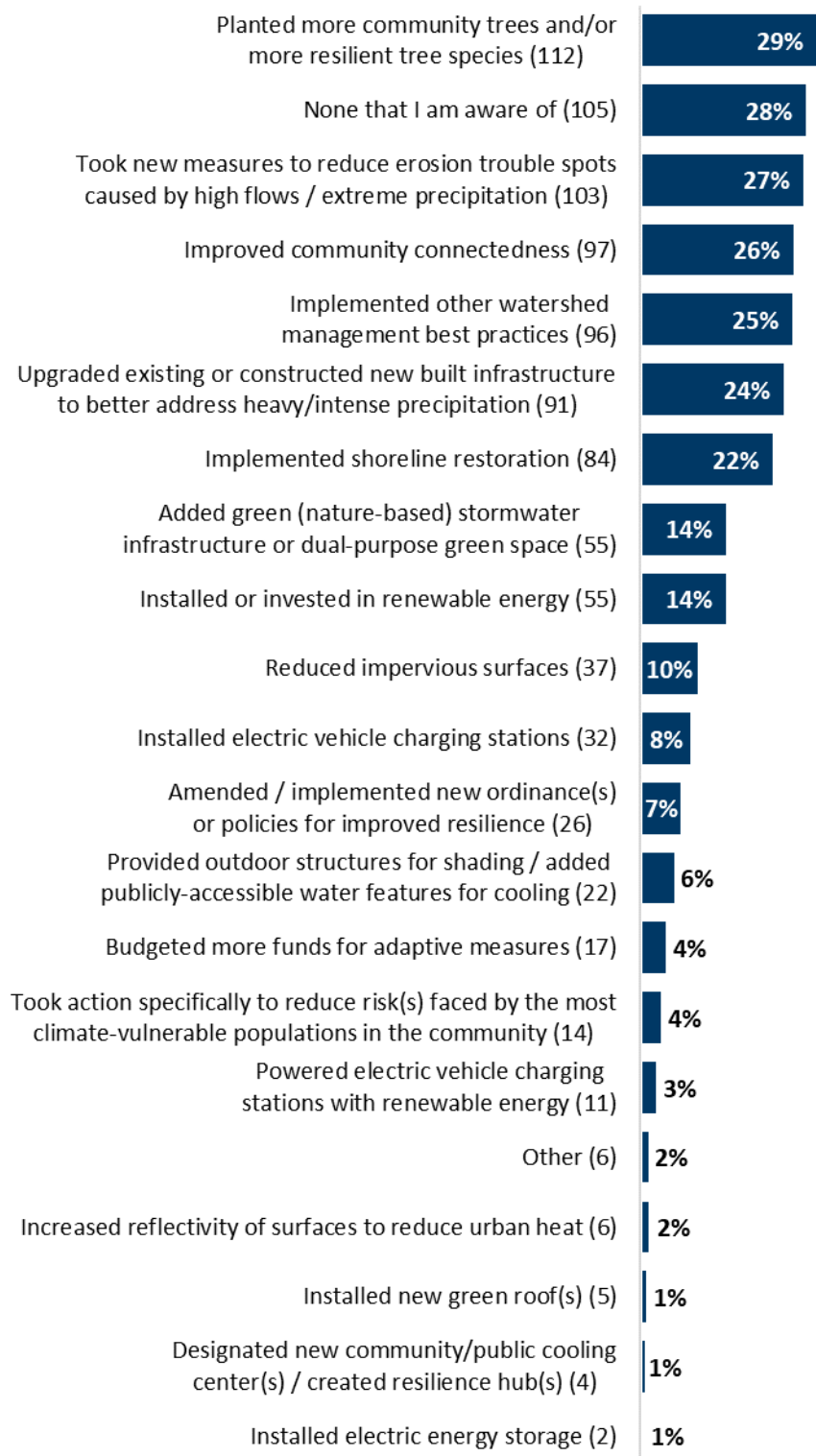


## Actions taken

The survey asked about actions organizations have taken in the past three years to increase resilience in their community or environment. More than two-thirds of 2022 respondents (69 percent) had taken at least one action, which was a slight increase from 65 percent in 2019. Figure 25 on the following page shows the 2022 results for individual actions.

Most often, respondents said their organizations have planted more community trees and/or more resilient tree species (29 percent). The 2022 survey offered more options than the 2019 survey, and modified some of the option language. Where the options between surveys are comparable, results were largely similar between 2019 and 2022, with no more than an increase or decrease of five percentage points. Twenty-eight percent of respondents said they were not aware of any actions to increase resilience, which was similar to the result in 2019 (29 percent).

**Figure 25. 2022 survey data: In the past three (3) years, what actions has your organization taken to adapt/increase the resiliency of the community or environment to our changing climate? Please select all that apply. (This list focuses on tangible actions. We'll ask in later questions about any planning or assessments your organization has completed.)**



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

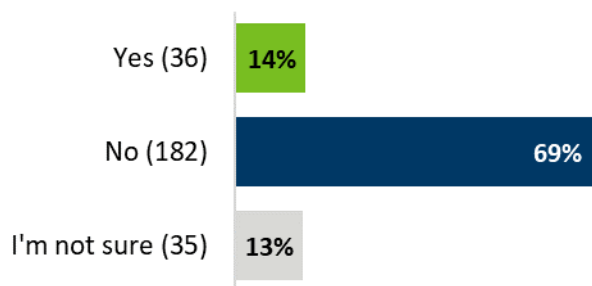
- *Beginning the process of learning about carbon credits and how our office can assist in the process to our landowners.*
- *Developed a new Natural Resources Management Program Plan, adopted a Climate Action Work Plan.*
- *Expanded soil health cost share programs.*
- *In process in upgrading storm drain.*
- *Planning with local units of government and communities.*
- *Wetland restoration.*

On a later question about other planning (see page 29), some organizations described relevant actions their organization had taken that did not involve planning, including:

- Created a committee to work with a seed legacy program.
- Completed wastewater and storm sewer projects to help address flooding issues.
- Assessed peatland restoration for its application in water quality and quantity management.

The 2022 survey introduced a new question asking whether the actions respondents had selected were a direct result of a written plan that addressed climate adaptation and resilience. This question appeared only to the 263 respondents who chose at least one action in the previous question. Figure 26 shows that only 14 percent of these respondents said their actions were a direct result of a written plan. Note that for this question, the percentages shown are calculated based on the number of respondents who received the question (263), not the total number of survey respondents (380). Four percent of respondents did not answer the question. Appendix L on page 113 explores which types of organizations answered yes to this question.

**Figure 26. 2022 survey data: Were any of the actions you took a direct result of a written plan that addressed climate adaptation and resilience?**

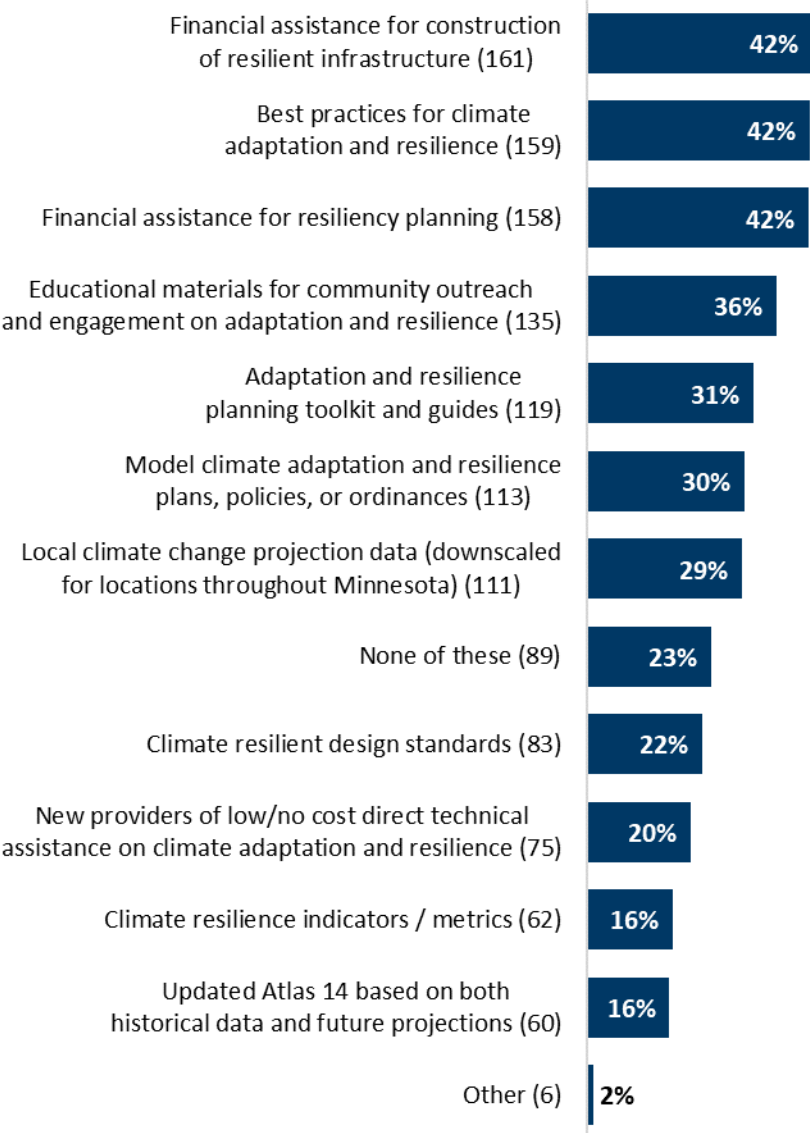


## Identified resources or assistance

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. The 2022 survey offered more options than the 2019 survey and modified some of the option language. Figure 27 on the following page shows the results.

Respondents most often selected the two financial assistance options, as well as best practices for climate adaptation and resilience (each at 42 percent). Nearly one-quarter of respondents (23 percent) indicated they were not interested in any of the resources or assistance listed. These respondents were mostly from small municipalities. More than three-quarters of the respondents that chose “none of these” were from cities (79 percent), and another 13 percent were from townships. About nine-tenths of the respondents who were not interested in the options listed were from organizations with 50 or fewer employees.

**Figure 27. 2022 survey data: What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please select all that apply.**



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

- *Elected officials who want climate change.*

- *Financial assistance to facilitate community conversations about adaptation and resilience.*
- *Financial assistance to increase staff capacity.*
- *Funding for Climate Action Work Plan implementation: stormwater/green infrastructure projects, gap funding for fleet electrification, loans to enable renewable (PPA) and energy efficiency projects, community center/resiliency hubs, etc.*
- *Information on working best management practices for climate adaptation and resilience into production agriculture. “What can farmers actively do to help?”*
- *We need changes to existing city policies, ordinances, and design standards that shift planning, design, and implementation from the current linear models with singular benefits to system-based models with multiple synergistic benefits that are measured across social, environmental, and economic outcomes. There is very little funding available for planning and feasibility studies that are pursuing restorative or circular economy solutions to climate change, systemic inequity, infrastructure debt.*

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

In the opening question to the 2022 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. The list was not intended to be exhaustive. This question was designed to frame the issue for survey respondents, and to gather respondents’ general ideas and impressions to potentially better understand organizational planning regarding climate adaptation and resilience. The 2022 survey offered some different options than the 2019 survey, but roughly the same number of total options.

Figure 28 shows the 2022 results. Overall, the vast majority of respondents (87 percent) selected at least one event or trend. The same percentage selected at least one option in the 2019 results, although the options were not identical across the surveys.

Respondents most often selected extreme rainfall and storms (54 percent), representing a decrease from 65 percent in 2019. The options that had the largest increases from 2019 were increased air quality problems (28 percent, up from 22 percent) and more frequent wildfires (7 percent, up from 3 percent). These trends align with documented events: Minnesota experienced major drought in 2021<sup>10</sup>, as well as the worst air quality conditions in recorded history (which were triggered by mostly out-of-state wildfires)<sup>11</sup>.

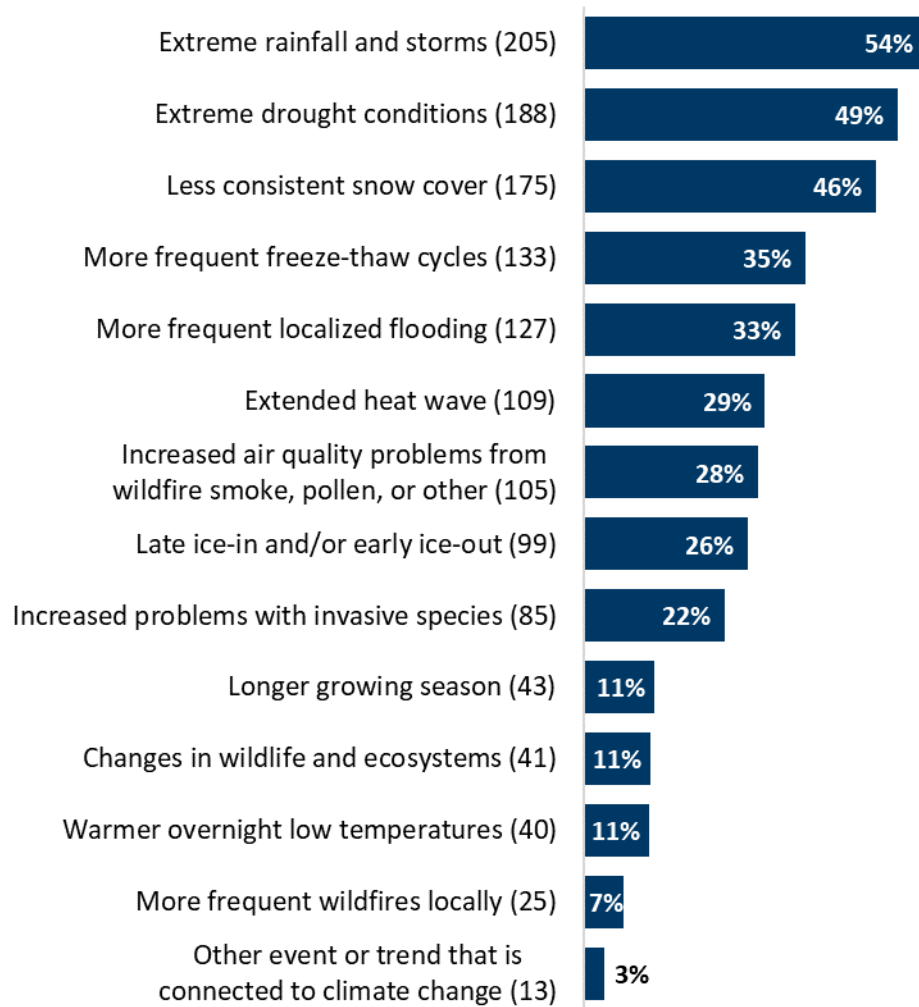
As in the previous two surveys, organizations that experienced one or more climate-related events or trends far more frequently identified plans or planning activities than those organizations that did not. This is explored further in Appendix I on page 91.

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<sup>10</sup> “The Drought of 2021,” Minnesota Department of Natural Resources, updated January 28, 2022, <https://www.dnr.state.mn.us/climate/journal/drought-2021.html>.

<sup>11</sup> “Are smoky summers the new normal?” Minnesota Pollution Control Agency, updated May 5, 2022, <https://www.pca.state.mn.us/featured/are-smoky-summer-new-normal>.

**Figure 28. 2022 survey data: 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 (e.g., residents, economy, infrastructure, natural resources)? Please select all that apply.**



If the respondent selected “other event or trend,” the survey asked them to describe the event or trend. One dozen survey respondents offered comments. About one-half discussed changes in precipitation and water, including changes in precipitation amounts, flooding, water levels, and ice coverage. A few others mentioned changes in seasonal transitions. The remaining comments covered changes in erosion and ecological diversity.

## 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. Thirty respondents provided a response to this question, excluding comments like “none.” Several were complimentary of the survey itself and the state’s prioritization of this topic, while others provided more detail on their earlier responses.

Several other respondents discussed how critical funding is for them to make progress on climate adaptation and resilience. Example comments include:

- *We would love to connect a walking/bike trail from one which exists just east of us and also would like to get green energy solutions for our community center, office/storage building, and our municipal liquor store but don't have the funds or the knowledge on how to sign up for grants for these things. Also our storm shelter needs a backup generator but we don't have the funds for it.*
- *State funding/loans to cover the matching dollars needed for federal grant program applications would be very welcome!*
- *MPCA funding is needed to support efforts focused on planning, rethinking, redesigning, or reframing the current infrastructure and waste paradigm. There needs to be funding available for feasibility studies and demonstrative closed-loop systems, where all materials are utilized as valued resources. MPCA needs to reexamine their own internal policies and ask why they are still only seeking siloed solutions to a systems-based problems. I have yet to review a grant or funding program that is not entrenched in a siloed approach. All MPCA projects and initiatives should be able to be evaluated based on their ability to achieve a net positive outcome across social, environmental, and economic indicators (no externalities). Anything short of a restorative, systems-based approach is only committing all of us to today's entrapments.*

Other respondents wrote that they wanted more regulatory flexibility, that climate issues are not a priority in small organizations like theirs, and that they did not believe humans were causing climate change.



# 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 the MPCA.

### Statewide indicator

This survey provided a new indicator of how many governmental organizations have engaged in planning efforts related to climate adaptation and resilience based on aggregate results from all three iterations of the survey. While individual survey response rates have not exceeded 33 percent, 57 percent of invited organizations have responded to at least one survey over the three iterations. Aggregate results provide a better picture of how many governmental organizations have engaged in this type of planning. Over the three survey years, 43 percent of *invited* organizations, and 75 percent of *responding* organizations, have responded to the survey and reported having a relevant planning effort or plan. Fifteen percent of *invited* organizations, and 25 percent of *responding* organizations, have responded to the survey and *never* reported a relevant plan.

At an individual survey level, 25 percent of organizations invited to participate in 2022 reported that they have at least one type of plan or planning effort with content that specifically addresses climate adaptation and resilience. While that percentage increased to 25 percent in 2019 from 18 percent in 2016, the percentage stayed roughly flat from 2019 to 2022. One possible explanation may be the COVID-19 pandemic, which might have limited organizations' capacity to focus on climate adaptation and resilience in the past two years. Another factor could be differences in which organizations responded to this survey compared with previous iterations. The 2022 survey received relatively more responses from smaller organizations, which survey results show engage less often in this type of work.

### Respondents' planning and actions

Overall, responding governmental organizations are engaged in a wide range of planning efforts. Analyzing the three survey iterations together, the most common types of plans have been water planning (34 percent of invited organizations over three surveys) and health and safety planning (28 percent of invited organizations over three surveys).

Looking at the 2022 survey results alone, 75 percent of responding organizations have plans or are engaged in planning efforts that specifically address climate adaptation and resilience in some way. Aggregate results for all three surveys told the same story: 75 percent of responding organizations have relevant plans or planning efforts.

On average, organizations in 2022 selected 4.4 of the 36 planning options listed. Specific 2022 survey results regarding planning include:

- More than half of responding organizations (59 percent) are engaged in water plans or planning efforts with climate adaptation and resilience content.
- About 41 percent of responding organizations indicated they are engaged in health and safety planning efforts that include content on climate adaptation and resilience.
- Nearly one-third of respondents have engaged in comprehensive planning efforts that include content on climate adaptation and resilience.
- About one-quarter of respondents indicated they are engaged in some additional type of planning effort that includes climate adaptation and resilience.
- Relatively few responding organizations (12 percent) are engaged in standalone climate adaptation planning efforts.
- In each question about types of planning (standalone, health and safety, natural resources, etc.), respondents could select the specific kinds of plans they had with relevant content. Across all the planning type questions, respondents most often selected that they did not have any of the listed plan types with relevant content. Only within water planning did respondents choose a plan type (wellhead protection) nearly as often they chose “none of the above.”
- About one-fifth of respondents have coordinated with other governmental organizations within Minnesota on climate adaptation and resilience planning or implementation.

When asked about actions their organizations have taken in the past three years to increase resilience in their community or environment, 69 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 (29 percent), taken new measures to reduce erosion trouble spots (27 percent), and improved community connectedness (26 percent). Only 14 percent of respondents who took an action said the steps they took were a direct result of a written plan that addressed climate adaptation and resilience.

## **Resources and assistance needed**

Responding organizations in 2022 provided input on the types of resources or assistance that would be helpful to their organization for climate adaptation and resilience planning. The most popular options involved financial assistance for construction and for planning, and best practices for climate adaptation and resilience (42 percent each). Twenty-three percent of respondents chose “none of these,” the vast majority of which were from cities and townships, and from organizations with 50 or fewer employees.

## **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 in 2022 (87 percent) selected at least one option. Respondents most often selected extreme rainfall and storms (54 percent), representing a decrease from 65 percent in 2019. The options that had the largest increases from 2019 were increased air

quality problems (28 percent, up from 22 percent) and more frequent wildfires (7 percent, up from 3 percent). 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 the MPCA 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.

**Coordinate survey metrics and strategies with Minnesota's Climate Action Framework:** The MPCA is developing a framework for achieving a carbon-neutral, resilient, and equitable future for Minnesotans, and it should be available later this year.<sup>12</sup> Future versions of this survey should align with the final framework.

**Continue with planned survey timing:** MAD continues to recommend that the MPCA 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.

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

- Continue to review open-ended survey responses to the "other" options. The 2022 version adjusted survey options based on responses to the 2019 survey. The overall number of open-ended comments decreased, which may have been in part because respondents saw more of the options they wanted to select. Continuing this practice will ensure respondents have options to select that best reflect their situation and wishes.
- Adjust question language where it makes sense. The 2022 survey modified the climate-related events and trends options based on weather events over the past three years. If the MPCA wishes to gauge how many organizations noticed recent trends, then continuing to modify the options each time is the best course. Alternatively, if there is an interest in examining trends over time, the MPCA could modify the language options to have more neutral choices rather than pre-designating a direction. For example, offering "changes in the consistency of snow cover" instead of "less consistent snow cover" would allow the MPCA to track the same types of events, regardless of whether the next survey happens after a winter with much more or much less snow than average.
- To date, this survey has largely not explored why relatively few governmental organizations in Minnesota have engaged in plans or planning efforts related to climate adaptation and resilience. The 2022 survey did add options for respondents to indicate that different types of plans were not relevant to their organizations, and this captured one reason organizations have not engaged in planning. However, future surveys could explore other reasons, such as small organization size or lack of interest. They could also explore what motivated organizations to take specific actions.

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<sup>12</sup> "Minnesota's Climate Action Framework," Minnesota Pollution Control Agency, accessed June 1, 2022, <https://climate.state.mn.us/minnesotas-climate-action-framework>.

**Consider how and whether to include townships:** Nearly 60 townships were invited to participate in this survey because they were included in the list of cities provided by the League of Minnesota Cities. However, the Minnesota Association of Townships estimates that the state has 1,780 townships, meaning only a small fraction of townships were invited to the survey. The analyses in this report that isolate township responses cannot be interpreted to be representative of all townships.

In the next survey, the MPCA could continue the practice from the 2016 and 2019 surveys of inviting only cities and not townships, or it could consider inviting all townships. Including townships would likely skew the response sample toward smaller organizations, and survey results show that smaller organizations engage in relevant planning efforts at lower rates than larger organizations. However, the MPCA may also be interested in providing additional supports and resources for townships, in which case including them in the survey could help focus those efforts.

**Continue to explore cumulative results:** Analyzing the results of individual surveys is necessary and helpful to understand snapshots in time. It is also the best approach for questions that focus on events and planning work since the previous survey iteration. However, MAD recommends continuing to calculate cumulative results across all survey years. These analyses provide better estimates of the indicators than single-year results.

As more organizations respond to the survey for the first time in the future—making the organizations that have responded more reflective of all invited organizations—it may also be effective to highlight the inverse of current indicators. In other words, to focus on the negative responses instead of the positive ones. For example, an inverse metric from the 2022 results is that 25 percent of all governmental organizations who have ever responded to the survey have *no* plan or planning effort of any type that has content specifically addressing climate adaptation and resilience. (Compared with 75 percent that have a plan or planning effort.)

**Use the survey as an opportunity to educate:** On the question about resources and partnerships usage, only 16 percent 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. The MPCA 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 the MPCA 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:** 1,153

**Survey design:** MPCA and Management Analysis and Development (MAD)

**Survey in the field:** February 14 through March 11, 2022

**Distribution:** Contacts in township, city, county, and tribal governments; contacts for soil and water conservation districts, watershed districts, and regional development organizations/commissions (additional description below in *Survey recipients* section)

**Data collection:** 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 the email list of cities from the League of Minnesota Cities. The contacts for city governments were typically the city administrator, city clerk, city clerk/treasurer, or some combination of those titles. The email list of cities included some townships, but not all townships in Minnesota. MPCA provided contact information for MAD to obtain the email list of counties from the Association of Minnesota Counties. 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 provided lists of tribal government contacts, who were typically in natural resources, environmental, or planning departments. MAD found contacts for regional development organizations/commissions on their organizational websites.

MAD sent an introductory email addressed from the MPCA Commissioner 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, provide information about the extent of planning efforts across the state, identify actions taken, and explore resources and assistance desired by the responding organizations. 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 not directly involved in development of the survey.

## Survey administration and analysis

MAD administered the survey online using Snap Survey Software, which records data as questionnaires are completed. The survey invitation from the MPCA Commissioner indicated that MAD was conducting the survey for the MPCA, and that MAD would maintain private data from survey respondents. For the first time, the survey stated that some organizational data might be identified publicly in data dashboards. It is not known if this had any impact on the response rate, which remained consistent with the 2019 survey.

The survey was open from February 14, 2022, through March 8, 2022.

To increase response rates, MAD's survey software sent three reminder emails to nonrespondents during the course of the survey; the first two were from MAD, while the final email was from the MPCA Commissioner 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.

**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 local, regional, tribal, and state governmental organizations in Minnesota 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 invited—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: 2022 Climate Adaptation and Resilience Planning Survey

## Introductory text

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

The Minnesota Pollution Control Agency (MPCA) is conducting this survey to assess progress from previous surveys in 2016 and 2019 on efforts by local and tribal 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 also feel free to check with others to get the answers you need. If you cannot complete the survey at one time, you can select the “Save” button 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.

### **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: warmer and wetter overall with increasing intensity and frequency of heavy rainfall, declining severity and frequency of extreme cold, and increasing incidence of heat waves and periods of drought.

### **Data privacy**

Management Analysis and Development (MAD) is conducting this survey. MAD is a neutral consulting group within Minnesota Management and Budget, which is a separate agency from the MPCA. MAD will create a summary report of all survey responses and will share responses with the MPCA. MAD will not attach your personal name or email address to your responses in files shared with the MPCA, and will remove potentially identifying information from written comments. Any potentially identifying information that you provide is considered private data under the Minnesota Data Practices Act (Minnesota Statutes §13.64).

MPCA may use the survey responses to create online data dashboards, and these may show some specific data for your organization such as types or number of plans.

### **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 select 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 and resilience, please contact Laura Millberg at the MPCA at [laura.millberg@state.mn.us](mailto:laura.millberg@state.mn.us) or 651-757-2568 or Sharon Stephens at the MPCA at [sharon.stephens@state.mn.us](mailto:sharon.stephens@state.mn.us) or 651-757-2172.

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](mailto:Kristina.Krull@state.mn.us) or 651-259-3813.

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

You can select the "Save" button 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. If you forget to complete the survey, you will receive a reminder email.

**Thank you for your time!**

## Questions

**1. 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 (e.g., residents, economy, infrastructure, natural resources)? Please select all that apply.**

- Late ice-in and/or early ice-out
- More frequent freeze-thaw cycles
- Less consistent snow cover
- Warmer overnight low temperatures
- Longer growing season
- Extended heat wave
- Extreme rainfall and storms
- More frequent localized flooding
- Extreme drought conditions
- More frequent wildfires locally
- Increased air quality problems from wildfire smoke, pollen, or other
- Increased problems with invasive species
- Changes in wildlife and ecosystems
- Other event or trend that is connected to climate change

**2. If you selected "other event or trend," please describe:**

**3. In the past three (3) years, what actions has your organization taken to adapt / increase the resiliency of the community or environment to our changing climate? Please select all that apply. (This list focuses on tangible actions. We'll ask in later questions about any planning or assessments your organization has completed.)**

- Added green (nature-based) stormwater infrastructure or dual-purpose green space



- Planted more community trees and/or more resilient tree species
- Installed new green roof(s)
- Upgraded existing or constructed new built infrastructure to better address heavy/intense precipitation (e.g., frequently flooded roadway, sewer capacity)
- Reduced impervious surfaces (e.g., installing permeable pavers, pervious concrete or porous asphalt, conversion to green space)
- Took new measures to reduce erosion trouble spots caused by high flows / extreme precipitation
- Implemented shoreline restoration
- Implemented other watershed management best practices (e.g., habitat and stream connectivity, septic system improvements)
- Designated new community/public cooling center(s) / created resilience hub(s)
- Provided outdoor structures for shading / added publicly-accessible water features for cooling
- Increased reflectivity of surfaces to reduce urban heat (e.g., white roofs)
- Installed or invested in renewable energy (e.g., wind or solar installation, solar garden participation)
- Installed electric energy storage
- Installed electric vehicle charging stations
- Powered electric vehicle charging stations with renewable energy
- Improved community connectedness (e.g., walkability, bikability, public gathering spaces, pedestrian safety)
- Took 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

4. If you selected “Other,” please describe what other actions your organization has taken:

5. [If they selected any actions in Q3] Were any of the actions you took a *direct result of a written plan* that addressed climate adaptation and resilience?

- Yes
- No
- I’m not sure

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.

6. 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
- This type of plan is not relevant to my organization

7. [Routed based on Q6] Which year did your organization adopt your comprehensive plan that addresses climate adaptation and resilience?
8. Has your organization engaged in any of the following *standalone* planning efforts specifically to address climate adaptation and resilience? Please select all that apply.
- Climate adaptation plan / strategic framework *completed*
  - Climate adaptation plan / strategic framework *in process*
  - Climate change vulnerability / climate vulnerable populations assessment *completed*
  - Climate change vulnerability / climate vulnerable populations assessment *in process*
  - Climate action / sustainability plan *completed*
  - Climate action / sustainability plan *in process*
  - None of the above
  - This type of plan is not relevant to my organization
9. [Routed based on Q8] Which year did your organization complete your climate adaptation plan / strategic framework?
10. [Routed based on Q8] Which year did your organization complete your climate change vulnerability / climate vulnerable populations assessment?
11. [Routed based on Q8] Which year did your organization complete your climate action / sustainability plan?
12. Has your organization coordinated with any other local/regional/tribal governmental organization(s) within Minnesota on climate adaptation and resilience planning or implementation?
- Yes
  - No
  - I don't know
13. Does your organization have any *health and safety* plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.
- Hazard mitigation (e.g., FEMA-related)
  - Emergency response
  - Continuity of operations
  - Emergency operations
  - Worker safety and work environment
  - Public health (e.g., vector-borne diseases, extreme heat, asthma/air quality)
  - Building codes inspection and enforcement
  - None of the above
  - This type of plan is not relevant to my organization
14. Does your organization have any *water* plans or planning efforts with content that specifically addresses climate adaptation and resilience? Please select 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
- This type of plan is not relevant to my organization

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

- Parks and park facilities
- Open / green space (excluding parks)
- Forest management
- Wildlife management
- Invasive species
- Urban and community forestry/tree canopy
- None of the above
- This type of plan is not relevant to my organization

**16. Has your organization engaged in any *additional planning efforts* with content that specifically addresses climate adaptation and resilience? Please select 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 (e.g., roads, multimodal)
- Social equity / human rights
- Workforce planning and development
- Strategic planning
- None of the above
- These types of plans are not relevant to my organization

**17. If your organization has engaged in any *other planning* not covered in any of the previous questions with content specifically related to climate adaptation and resilience, please describe it:**

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

- Participate in the Minnesota GreenStep Program for Cities, Tribal Nations, or Schools
- Hosted a Minnesota GreenCorps member
- None of the above

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

- Local climate change projection data (downscaled for locations throughout Minnesota)
- Updated Atlas 14 based on both historical data and future projections
- Climate resilient design standards
- Climate resilience indicators / metrics
- Financial assistance for resiliency planning
- Financial assistance for construction of resilient infrastructure
- New providers of low/no cost direct technical assistance on climate adaptation and resilience
- Best practices for climate adaptation and resilience
- Adaptation and resilience planning toolkit and guides
- Educational materials for community outreach and engagement on adaptation and resilience
- Model climate adaptation and resilience plans, policies, or ordinances
- Other
- None of these

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

Please provide information about your organization:

**21. Organization type**

- City
- Town / township
- County
- Regional development organization / commission
- Tribal government
- Watershed district / organization
- Soil and water conservation district

**22. Number of employees in your organization**

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

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

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

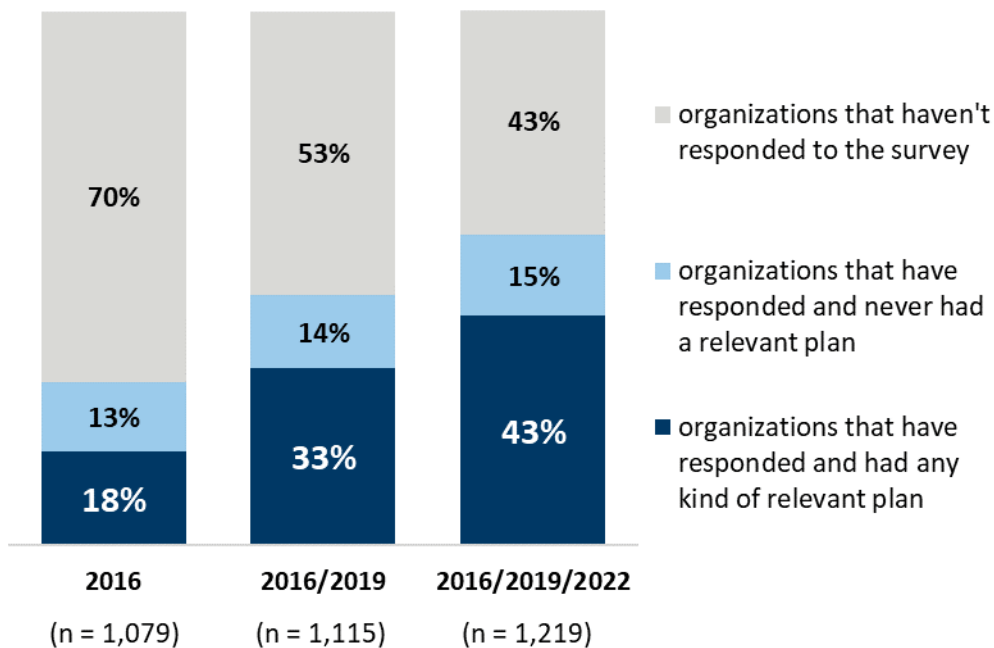
# Appendix C: Other indicator methods

This section presents more information about the methodologies MAD and the MPCA considered for calculating the indicator.

## Look at aggregate survey data, and analyze based on the number of invited organizations

Figure 29 shows part of the new indicator, along with the historical results of this method. Specifically, it shows how many organizations have *ever* reported having relevant planning on any of the three surveys, as a percentage of all *invited* organizations. Of the 1,219 organizations ever invited to the survey, 521 (43 percent) have reported having a relevant plan type at least once. Fifteen percent of invited organizations have reported never having any relevant plan type, and 43 percent of organizations have never participated in the survey. The analysis shows a relatively steady percentage of responding organizations which have *no* relevant plan in each of the three surveys, but the percentage with a relevant plan increases with each successive survey.

**Figure 29. Governmental organizations in Minnesota that have ever reported having climate adaptation or resilience content in any survey, as a percentage of *invited* organizations<sup>13</sup>**



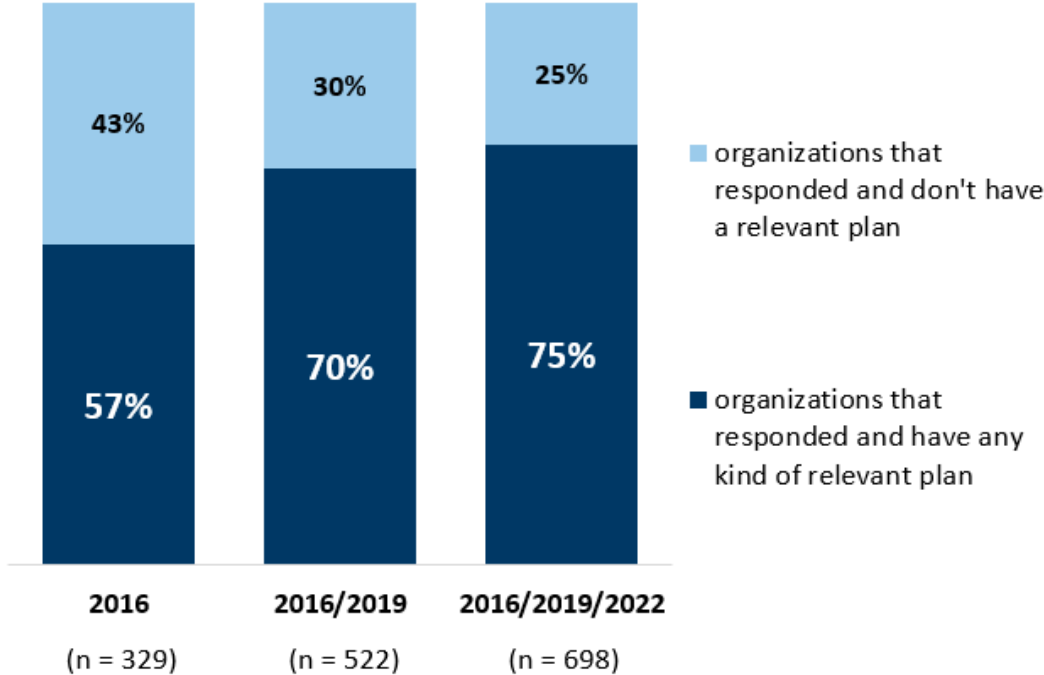
<sup>13</sup> A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any of the plan/planning types in survey questions about climate adaptation or resilience planning efforts. In a small number of cases, MAD designated a respondent as being engaged in planning based on their written comments. Organizations were not counted multiple times.

It is also possible to study the indicator as a percentage of how many organizations have ever *responded* to the survey, instead of how many have ever been *invited*. Over the three years of the survey, 698 organizations have responded to the survey at least once, and 521 of them have reported having a relevant plan at least once. That means that 75 percent of responding organizations have engaged in relevant planning.

## Look at aggregate survey data, and analyze based on the number of responding organizations

Another approach is to examine how many of the responding organizations have *ever* reported having different plan types in any of the three surveys, as a percentage of all organizations that have ever taken the survey. Figure 30 shows part of the new indicator as well as the historical aggregate values. As of 2022, 75 percent of responding organizations have reported having a relevant planning effort or plan. The data show that compared with 2019, only an additional 5 percent of responding organizations in 2022 reported having relevant plans. This could be in part because of the COVID-19 pandemic and the change in the types of responding organizations, as discussed earlier in the report.

**Figure 30. Governmental organizations in Minnesota that have ever reported having climate adaptation or resilience content in any survey, as a percentage of *responding* organizations<sup>14</sup>**



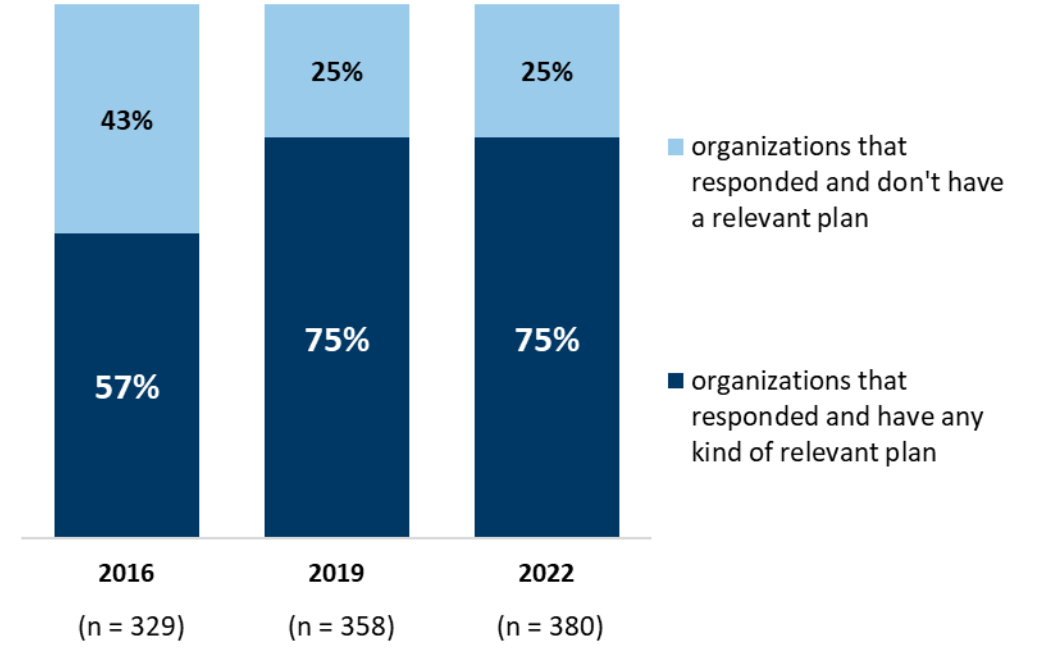
<sup>14</sup> A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any of the plan/planning types in survey questions about climate adaptation or resilience planning efforts. In a small number of cases, MAD designated a respondent as being engaged in planning based on their written comments. Organizations were not counted multiple times.

# Look at individual survey years, and analyze based on the number of responding organizations

This approach involves analyzing individual survey years. Specifically, it calculates how many organizations have engaged in relevant planning as a proportion of all *responding* organizations, not as a proportion of all *invited* organizations for an individual survey.

Figure 31 shows the results for each survey using this approach. Overall, 75 percent of responding organizations reported having any kind of plan in both 2019 and in 2022. This shows the limitations of the looking at individual survey years: the 2019 indicator was 75 percent in the figure below, which is 5 percentage points higher than the aggregate 2019 indicator in Figure 30.

**Figure 31. Governmental organizations in Minnesota that reported having climate adaptation or resilience content in any survey, as a percentage of *responding* organizations<sup>15</sup>**



<sup>15</sup> A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any of the plan/planning types in survey questions about climate adaptation or resilience planning efforts. In a small number of cases each year, MAD designated a respondent as being engaged in planning based on their written comments. Organizations were not counted multiple times.

# Appendix D: Organizational plans over time

Eighty-eight organizations have taken all three iterations of the survey. This appendix explores how their planning has changed over time.

More than half (56 percent) of these organizations reported a larger number of plans with related content in 2022 than they did in 2016. About one-fifth (18 percent) reported the same number of plans in 2022 as they did in 2016.

Table 7 shows how often these organizations reported having different types of relevant plans. With each iteration of the survey, a larger percentage of these organizations have reported having each of the plan types. The two exceptions were with additional planning in 2016 and 2019, where the percentage of organizations with an additional plan type stayed the same, and with standalone planning in 2019 and 2022, where the percentage decreased slightly.

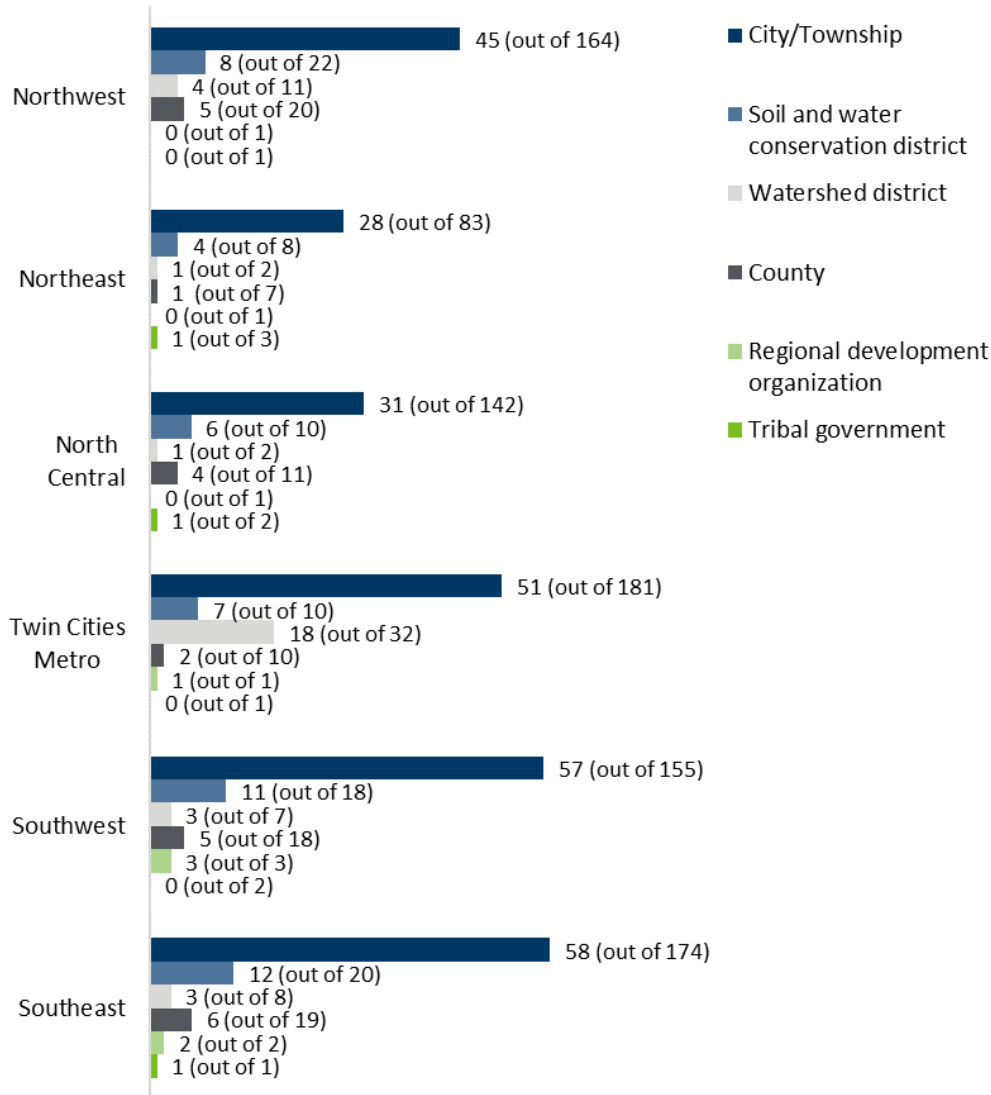
**Table 7. Plan type prevalence among organizations that have taken the survey three times (n = 88)**

<b>Plan type</b>	<b>2016</b>	<b>2019</b>	<b>2022</b>
Standalone plan	8%	14%	13%
Comprehensive plan	17%	32%	40%
Health and safety plan	38%	34%	45%
Water plan	39%	53%	65%
Natural resources plan	26%	27%	36%
Additional plan	25%	25%	27%
Any plan	57%	70%	82%



# Appendix E: Survey respondents by region and organization type

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



Region	City / Township	SWCD	Watershed district	County	RDC	Tribal government
Northwest	45	8	4	5	0	0
Northeast	28	4	1	1	0	1
North Central	31	6	1	4	0	1
Twin Cities Metro	51	7	18	2	1	0
Southwest	57	11	3	5	3	0
Southeast	58	12	3	6	2	1

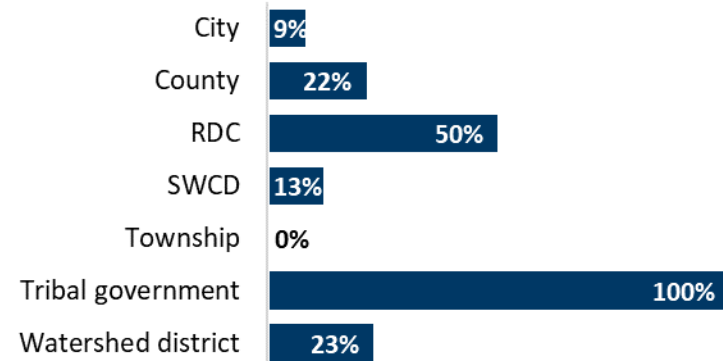
# Appendix F: Survey results—by broad categories

This appendix shares survey results for respondents by organization type, region, and size of organization.

## Organization type

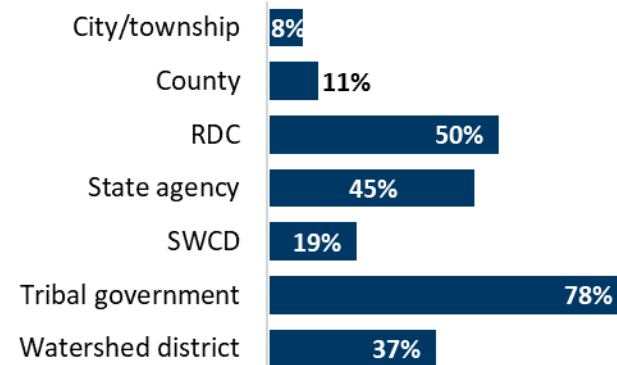
**2022 data: Engaged in *standalone* planning activity specifically to address climate adaptation and resilience**

Org. type	None	One or more	Total	One or more %
City	219	21	240	9%
County	18	5	23	22%
RDC	3	3	6	50%
SWCD	42	6	48	13%
Township	30	0	30	0%
Tribal government	0	3	3	100%
Watershed district	23	7	30	23%
<b>Total</b>	<b>335</b>	<b>45</b>	<b>380</b>	<b>12%</b>



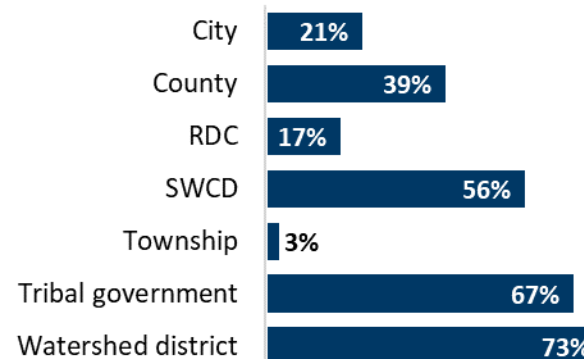
**2016–2022 data: Engaged in *standalone* planning activity specifically to address climate adaptation and resilience**

Org. type	Never reported having	Reported having at least once	Total	Reported having at least once %
City/township	434	38	472	8%
County	47	6	53	11%
RDC	3	3	6	50%
State agency	16	13	29	45%
SWCD	62	15	77	19%
Tribal government	2	7	9	78%
Watershed district	33	19	52	37%
<b>Total</b>	<b>597</b>	<b>101</b>	<b>698</b>	<b>14%</b>



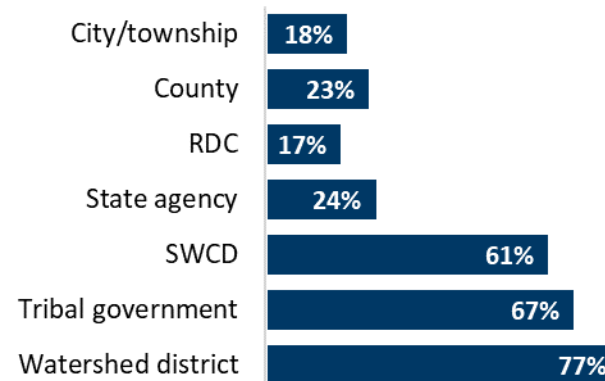
**2022 data: Engaged in *comprehensive* planning with content specifically addressing climate adaptation and resilience**

Org. type	None	One or more	Total	One or more %
City	189	51	240	21%
County	14	9	23	39%
RDC	5	1	6	17%
SWCD	21	27	48	56%
Township	29	1	30	3%
Tribal government	1	2	3	67%
Watershed district	8	22	30	73%
<b>Total</b>	<b>267</b>	<b>113</b>	<b>380</b>	<b>30%</b>



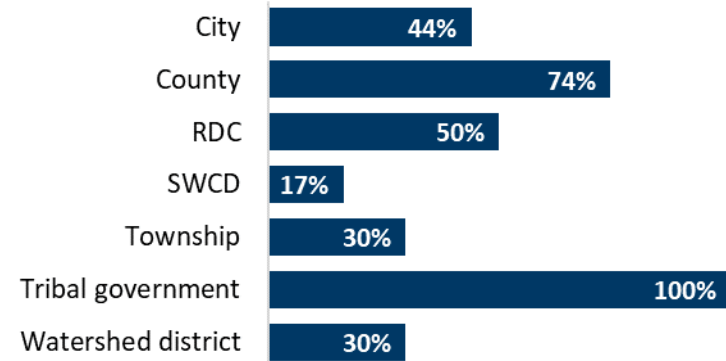
**2016–2022 data: Engaged in *comprehensive* planning with content specifically addressing climate adaptation and resilience**

Org. type	Never reported having	Reported having at least once	Total	Reported having at least once %
City/township	387	85	472	18%
County	41	12	53	23%
RDC	5	1	6	17%
State agency	22	7	29	24%
SWCD	30	47	77	61%
Tribal government	3	6	9	67%
Watershed district	12	40	52	77%
<b>Total</b>	<b>500</b>	<b>198</b>	<b>698</b>	<b>28%</b>



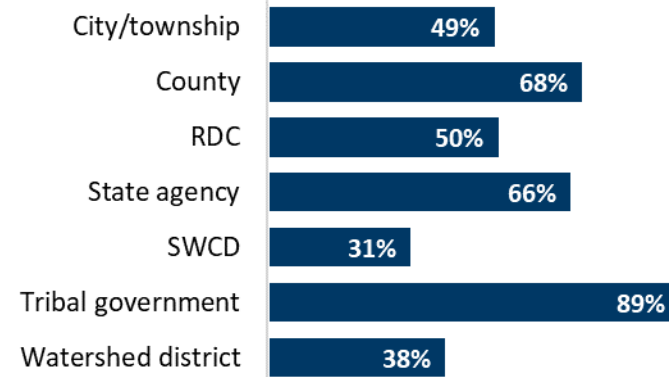
**2022 data: Engaged in *health/safety* planning with content specifically addressing climate adaptation and resilience**

Org. type	None	One or more	Total	One or more %
City	134	106	240	44%
County	6	17	23	74%
RDC	3	3	6	50%
SWCD	40	8	48	17%
Township	21	9	30	30%
Tribal government	0	3	3	100%
Watershed district	21	9	30	30%
<b>Total</b>	<b>225</b>	<b>155</b>	<b>380</b>	<b>41%</b>



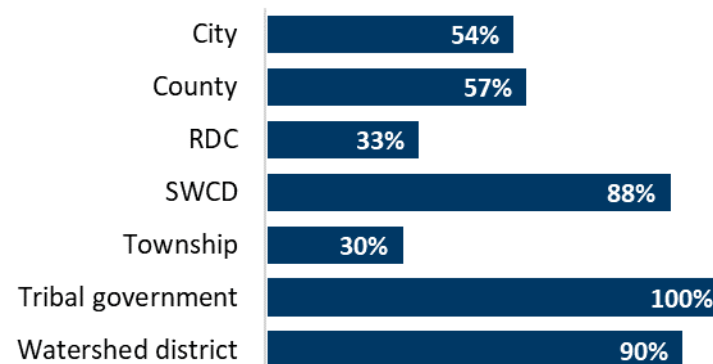
**2016–2022 data: Engaged in *health/safety* planning with content specifically addressing climate adaptation and resilience**

Org. type	Never reported having	Reported having at least once	Total	Reported having at least once %
City/township	240	232	472	49%
County	17	36	53	68%
RDC	3	3	6	50%
State agency	10	19	29	66%
SWCD	53	24	77	31%
Tribal government	1	8	9	89%
Watershed district	32	20	52	38%
<b>Total</b>	<b>356</b>	<b>342</b>	<b>698</b>	<b>49%</b>



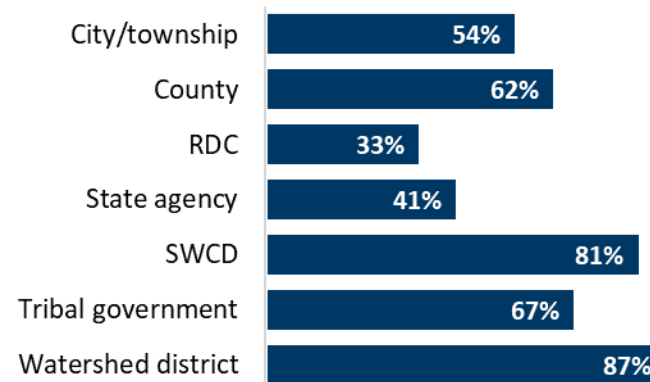
**2022 data: Engaged in *water* planning with content specifically addressing climate adaptation and resilience**

Org. type	None	One or more	Total	One or more %
City	111	129	240	54%
County	10	13	23	57%
RDC	4	2	6	33%
SWCD	6	42	48	88%
Township	21	9	30	30%
Tribal government	0	3	3	100%
Watershed district	3	27	30	90%
<b>Total</b>	<b>155</b>	<b>225</b>	<b>380</b>	<b>59%</b>



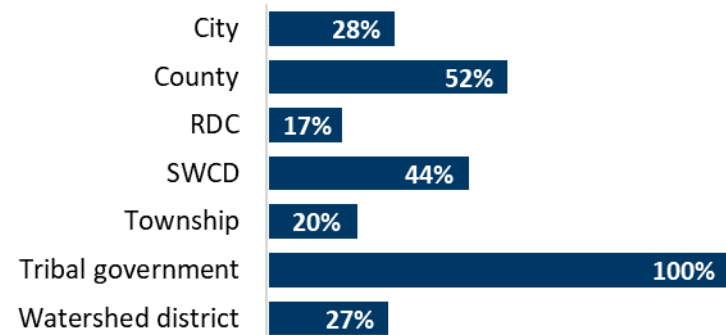
**2016–2022 data: Engaged in *water* planning with content specifically addressing climate adaptation and resilience**

Org. type	Never reported having	Reported having at least once	Total	Reported having at least once %
City/township	217	255	472	54%
County	20	33	53	62%
RDC	4	2	6	33%
State agency	17	12	29	41%
SWCD	15	62	77	81%
Tribal government	3	6	9	67%
Watershed district	7	45	52	87%
<b>Total</b>	<b>283</b>	<b>415</b>	<b>698</b>	<b>59%</b>



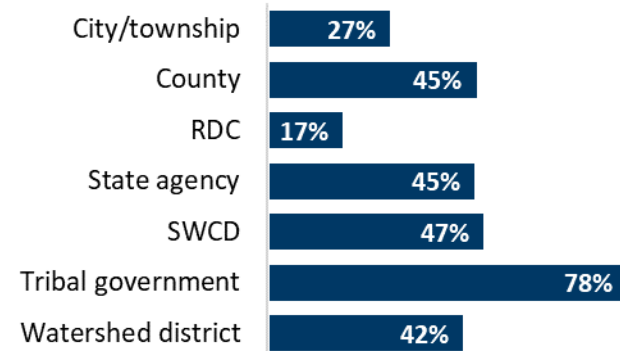
**2022 data: Engaged in *natural resources* planning with content specifically addressing climate adaptation and resilience**

Org. type	None	One or more	Total	One or more %
City	173	67	240	28%
County	11	12	23	52%
RDC	5	1	6	17%
SWCD	27	21	48	44%
Township	24	6	30	20%
Tribal government	0	3	3	100%
Watershed district	22	8	30	27%
<b>Total</b>	<b>262</b>	<b>118</b>	<b>380</b>	<b>31%</b>



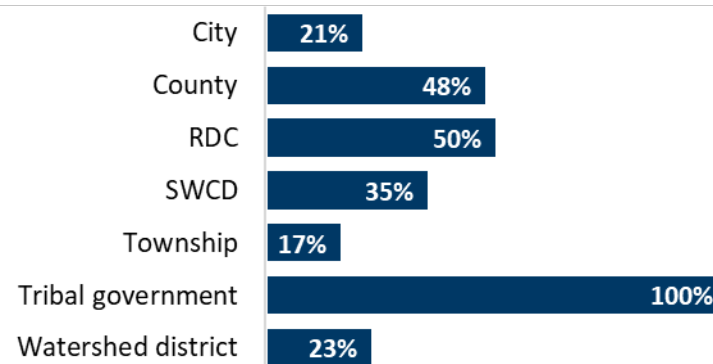
**2016–2022 data: Engaged in *natural resources* planning with content specifically addressing climate adaptation and resilience**

Org. type	Never reported having	Reported having at least once	Total	Reported having at least once %
City/township	346	126	472	27%
County	29	24	53	45%
RDC	5	1	6	17%
State agency	16	13	29	45%
SWCD	41	36	77	47%
Tribal government	2	7	9	78%
Watershed district	30	22	52	42%
<b>Total</b>	<b>469</b>	<b>229</b>	<b>698</b>	<b>33%</b>



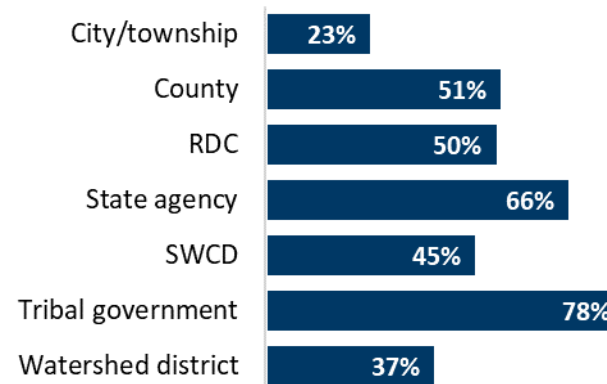
**2022 data: Engaged in any *additional* planning with content specifically addressing climate adaptation and resilience**

Org. type	None	One or more	Total	One or more %
City	189	51	240	21%
County	12	11	23	48%
RDC	3	3	6	50%
SWCD	31	17	48	35%
Township	25	5	30	17%
Tribal government	0	3	3	100%
Watershed district	23	7	30	23%
<b>Total</b>	<b>283</b>	<b>97</b>	<b>380</b>	<b>26%</b>



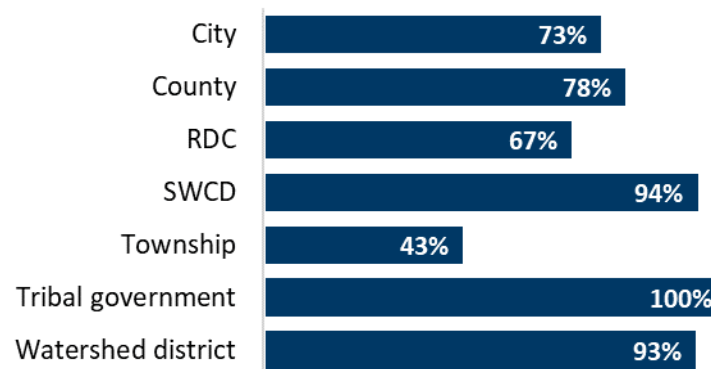
**2016–2022 data: Engaged in any *additional* planning with content specifically addressing climate adaptation and resilience**

Org. type	Never reported having	Reported having at least once	Total	Reported having at least once %
City/township	364	108	472	23%
County	26	27	53	51%
RDC	3	3	6	50%
State agency	10	19	29	66%
SWCD	42	35	77	45%
Tribal government	2	7	9	78%
Watershed district	33	19	52	37%
<b>Total</b>	<b>480</b>	<b>218</b>	<b>698</b>	<b>31%</b>



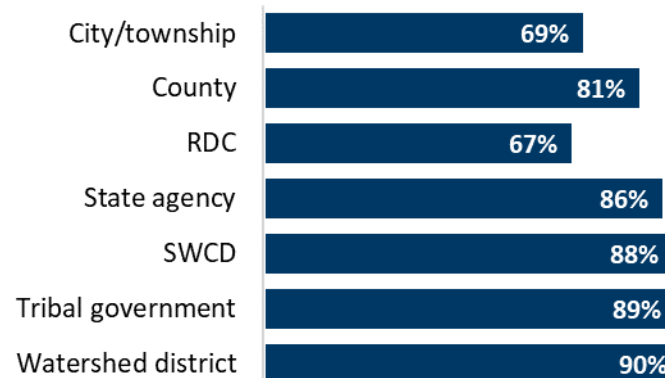
**2022 data: Engaged in *any* type of relevant planning activity (respondents who selected plans or planning efforts in any category)**

Org. type	None	One or more	Total	One or more %
City	65	175	240	73%
County	5	18	23	78%
RDC	2	4	6	67%
SWCD	3	45	48	94%
Township	17	13	30	43%
Tribal government	0	3	3	100%
Watershed district	2	28	30	93%
<b>Total</b>	<b>94</b>	<b>286</b>	<b>380</b>	<b>75%</b>



**2016–2022 data: Engaged in *any* type of relevant planning activity (respondents who selected plans or planning efforts in any category)**

Org. type	Never reported having	Reported having at least once	Total	Reported having at least once %
City/township	146	326	472	69%
County	10	43	53	81%
RDC	2	4	6	67%
State agency	4	25	29	86%
SWCD	9	68	77	88%
Tribal government	1	8	9	89%
Watershed district	5	47	52	90%
<b>Total</b>	<b>177</b>	<b>521</b>	<b>698</b>	<b>75%</b>

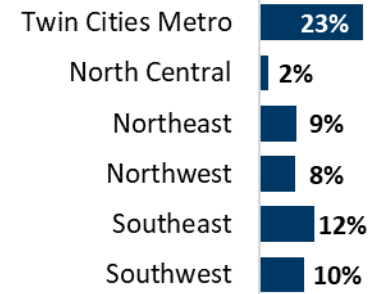




## Region

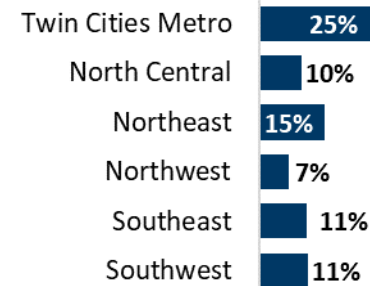
### 2022 data: Engaged in *standalone* planning activity specifically to address climate adaptation and resilience

Region	None	One or more	Total	One or more %
TC Metro	61	18	79	23%
North Central	42	1	43	2%
Northeast	32	3	35	9%
Northwest	57	5	62	8%
Southeast	72	10	82	12%
Southwest	71	8	79	10%
<b>Total</b>	<b>335</b>	<b>45</b>	<b>380</b>	<b>12%</b>



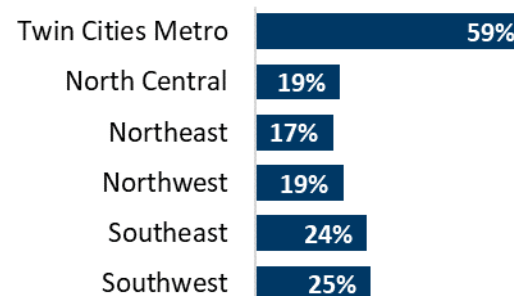
### 2016–2022 data: Engaged in *standalone* planning activity specifically to address climate adaptation and resilience

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
TC Metro	103	34	137	25%
North Central	75	8	83	10%
Northeast	47	8	55	15%
Northwest	111	8	119	7%
Southeast	124	15	139	11%
Southwest	121	15	136	11%
<b>Total</b>	<b>597</b>	<b>101</b>	<b>698</b>	<b>14%</b>



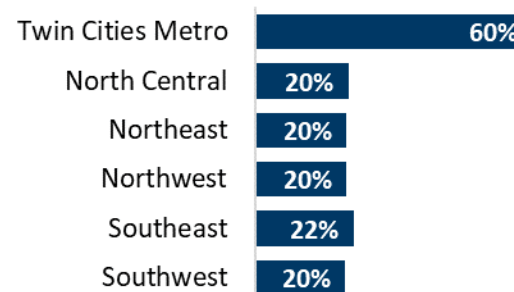
**2022 data: Engaged in *comprehensive* planning with content specifically addressing climate adaptation and resilience**

Region	None	One or more	Total	One or more %
TC Metro	32	47	79	59%
North Central	35	8	43	19%
Northeast	29	6	35	17%
Northwest	50	12	62	19%
Southeast	62	20	82	24%
Southwest	59	20	79	25%
<b>Total</b>	<b>267</b>	<b>113</b>	<b>380</b>	<b>30%</b>



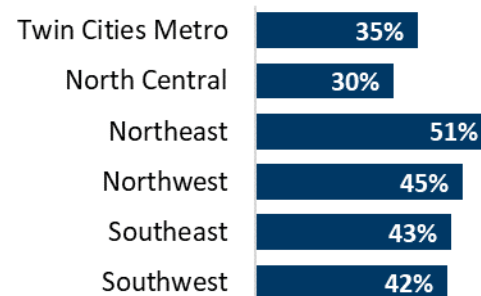
**2016–2022 data: Engaged in *comprehensive* planning with content specifically addressing climate adaptation and resilience**

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
TC Metro	55	82	137	60%
North Central	66	17	83	20%
Northeast	44	11	55	20%
Northwest	95	24	119	20%
Southeast	109	30	139	22%
Southwest	109	27	136	20%
<b>Total</b>	<b>500</b>	<b>198</b>	<b>698</b>	<b>28%</b>



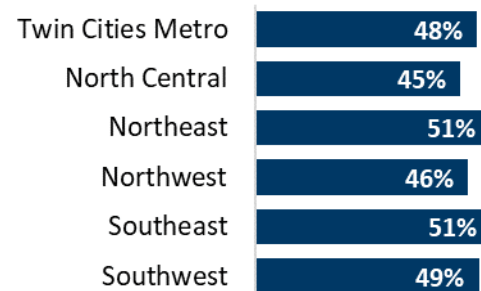
**2022 data: Engaged in *health/safety* planning with content specifically addressing climate adaptation and resilience**

Region	None	One or more	Total	One or more %
TC Metro	51	28	79	35%
North Central	30	13	43	30%
Northeast	17	18	35	51%
Northwest	34	28	62	45%
Southeast	47	35	82	43%
Southwest	46	33	79	42%
<b>Total</b>	<b>225</b>	<b>155</b>	<b>380</b>	<b>41%</b>



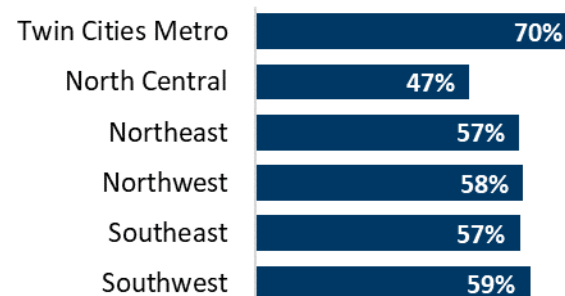
**2016–2022 data: Engaged in *health/safety* planning with content specifically addressing climate adaptation and resilience**

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
TC Metro	71	66	137	48%
North Central	46	37	83	45%
Northeast	27	28	55	51%
Northwest	64	55	119	46%
Southeast	68	71	139	51%
Southwest	70	66	136	49%
<b>Total</b>	<b>356</b>	<b>342</b>	<b>698</b>	<b>49%</b>



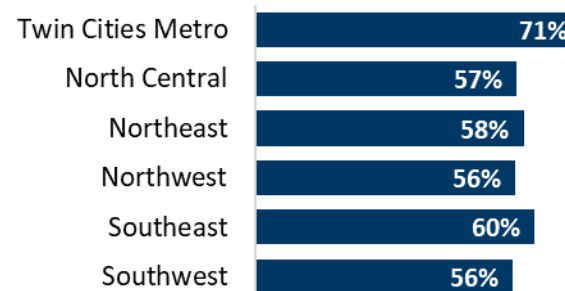
**2022 data: Engaged in *water* planning with content specifically addressing climate adaptation and resilience**

Region	None	One or more	Total	One or more %
TC Metro	24	55	79	70%
North Central	23	20	43	47%
Northeast	15	20	35	57%
Northwest	26	36	62	58%
Southeast	35	47	82	57%
Southwest	32	47	79	59%
<b>Total</b>	<b>155</b>	<b>225</b>	<b>380</b>	<b>59%</b>



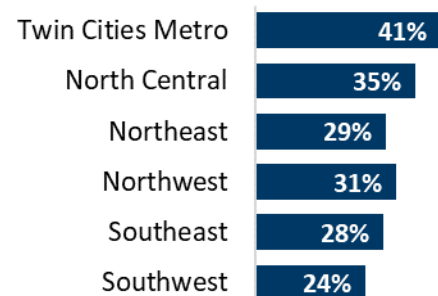
**2016–2022 data: Engaged in *water* planning with content specifically addressing climate adaptation and resilience**

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
TC Metro	40	97	137	71%
North Central	36	47	83	57%
Northeast	23	32	55	58%
Northwest	52	67	119	56%
Southeast	55	84	139	60%
Southwest	60	76	136	56%
<b>Total</b>	<b>283</b>	<b>415</b>	<b>698</b>	<b>59%</b>



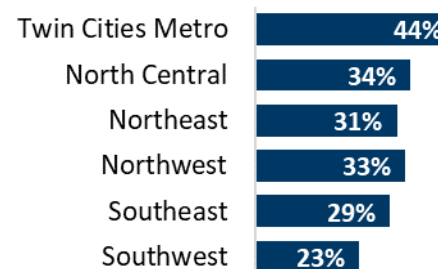
**2022 data: Engaged in *natural resources planning* with content specifically addressing climate adaptation and resilience**

Region	None	One or more	Total	One or more %
TC Metro	47	32	79	41%
North Central	28	15	43	35%
Northeast	25	10	35	29%
Northwest	43	19	62	31%
Southeast	59	23	82	28%
Southwest	60	19	79	24%
<b>Total</b>	<b>262</b>	<b>118</b>	<b>380</b>	<b>31%</b>



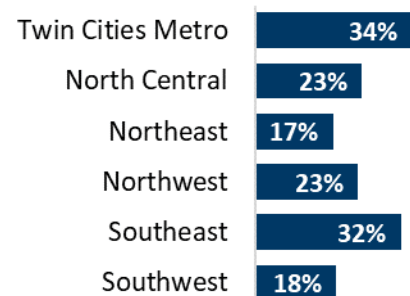
**2016–2022 data: Engaged in *natural resources planning* with content specifically addressing climate adaptation and resilience**

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
TC Metro	77	60	137	44%
North Central	55	28	83	34%
Northeast	38	17	55	31%
Northwest	80	39	119	33%
Southeast	98	41	139	29%
Southwest	105	31	136	23%
<b>Total</b>	<b>469</b>	<b>229</b>	<b>698</b>	<b>33%</b>



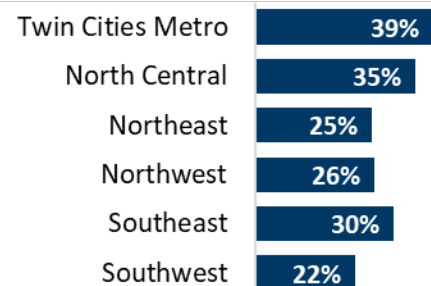
**2022 data: Engaged in any *additional* planning with content specifically addressing climate adaptation and resilience**

Region	None	One or more	Total	One or more %
TC Metro	52	27	79	34%
North Central	33	10	43	23%
Northeast	29	6	35	17%
Northwest	48	14	62	23%
Southeast	56	26	82	32%
Southwest	65	14	79	18%
<b>Total</b>	<b>283</b>	<b>97</b>	<b>380</b>	<b>26%</b>



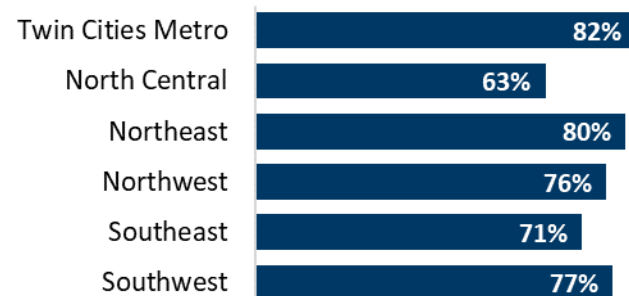
**2016–2022 data: Engaged in any *additional* planning with content specifically addressing climate adaptation and resilience**

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
TC Metro	84	53	137	39%
North Central	54	29	83	35%
Northeast	41	14	55	25%
Northwest	88	31	119	26%
Southeast	97	42	139	30%
Southwest	106	30	136	22%
<b>Total</b>	<b>480</b>	<b>218</b>	<b>698</b>	<b>31%</b>



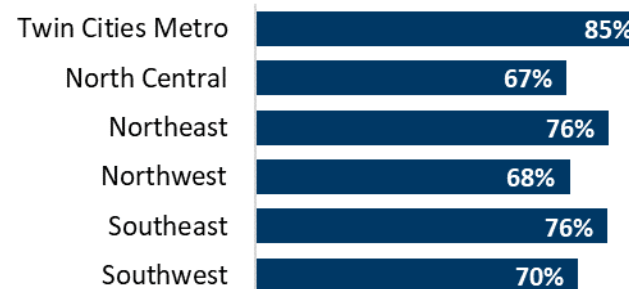
**2022 data: Engaged in *any* type of relevant planning activity (respondents who selected plans or planning efforts in any category)**

Region	None	One or more	Total	One or more %
TC Metro	14	65	79	82%
North Central	16	27	43	63%
Northeast	7	28	35	80%
Northwest	15	47	62	76%
Southeast	24	58	82	71%
Southwest	18	61	79	77%
<b>Total</b>	<b>94</b>	<b>286</b>	<b>380</b>	<b>75%</b>



**2016–2022 data: Engaged in *any* type of relevant planning activity (respondents who selected plans or planning efforts in any category)**

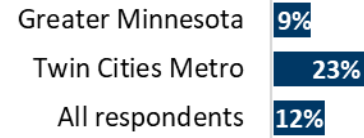
Region	Never reported having	Reported having at least once	Total	Reported having at least once %
TC Metro	21	116	137	85%
North Central	27	56	83	67%
Northeast	13	42	55	76%
Northwest	38	81	119	68%
Southeast	33	106	139	76%
Southwest	41	95	136	70%
<b>Total</b>	<b>177</b>	<b>521</b>	<b>698</b>	<b>75%</b>



# Greater Minnesota/Metro

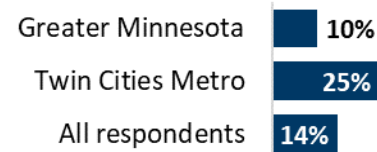
## 2022 data: Engaged in *standalone* planning activity specifically to address climate adaptation and resilience

Region	None	One or more	Total	One or more %
Greater Minnesota	274	27	301	9%
Twin Cities Metro	61	18	79	23%
<b>Total</b>	<b>335</b>	<b>45</b>	<b>380</b>	<b>12%</b>



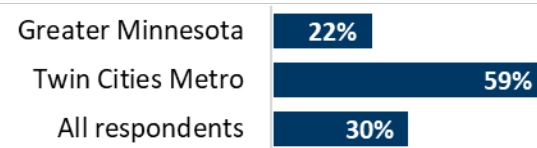
## 2016–2022 data: Engaged in *standalone* planning activity specifically to address climate adaptation and resilience

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
Greater Minnesota	478	54	532	10%
Twin Cities Metro	103	34	137	25%
<b>Total</b>	<b>597</b>	<b>101</b>	<b>698</b>	<b>14%</b>



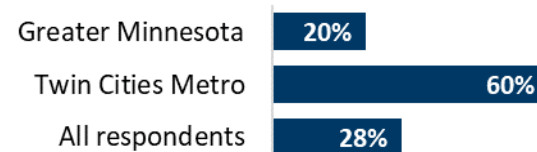
## 2022 data: Engaged in *comprehensive* planning with content specifically addressing climate adaptation and resilience

Region	None	One or more	Total	One or more %
Greater Minnesota	235	66	301	22%
Twin Cities Metro	32	47	79	59%
<b>Total</b>	<b>267</b>	<b>113</b>	<b>380</b>	<b>30%</b>



## 2016–2022 data: Engaged in *comprehensive* planning with content specifically addressing climate adaptation and resilience

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
Greater Minnesota	423	109	532	20%
Twin Cities Metro	55	82	137	60%
<b>Total</b>	<b>500</b>	<b>198</b>	<b>698</b>	<b>28%</b>





**2022 data: Engaged in *health/safety* planning with content specifically addressing climate adaptation and resilience**

Region	None	One or more	Total	One or more %
Greater Minnesota	174	127	301	42%
Twin Cities Metro	51	28	79	35%
<b>Total</b>	<b>225</b>	<b>155</b>	<b>380</b>	<b>41%</b>



**2016–2022 data: Engaged in *health/safety* planning with content specifically addressing climate adaptation and resilience**

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
Greater Minnesota	275	257	532	48%
Twin Cities Metro	71	66	137	48%
<b>Total</b>	<b>356</b>	<b>342</b>	<b>698</b>	<b>49%</b>



**2022 data: Engaged in *water* planning with content specifically addressing climate adaptation and resilience**

Region	None	One or more	Total	One or more %
Greater Minnesota	131	170	301	56%
Twin Cities Metro	24	55	79	70%
<b>Total</b>	<b>155</b>	<b>225</b>	<b>380</b>	<b>59%</b>



**2016–2022 data: Engaged in *water* planning with content specifically addressing climate adaptation and resilience**

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
Greater Minnesota	226	306	532	58%
Twin Cities Metro	40	97	137	71%
<b>Total</b>	<b>283</b>	<b>415</b>	<b>698</b>	<b>59%</b>



**2022 data: Engaged in *natural resources planning* with content specifically addressing climate adaptation and resilience**

Region	None	One or more	Total	One or more %
Greater Minnesota	215	86	301	29%
Twin Cities Metro	47	32	79	41%
<b>Total</b>	<b>262</b>	<b>118</b>	<b>380</b>	<b>31%</b>



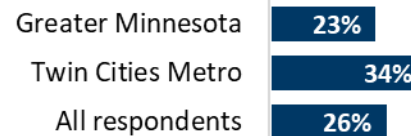
**2016–2022 data: Engaged in *natural resources planning* with content specifically addressing climate adaptation and resilience**

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
Greater Minnesota	376	156	532	29%
Twin Cities Metro	77	60	137	44%
<b>Total</b>	<b>469</b>	<b>229</b>	<b>698</b>	<b>33%</b>



**2022 data: Engaged in any *additional* planning with content specifically addressing climate adaptation and resilience**

Region	None	One or more	Total	One or more %
Greater Minnesota	231	70	301	23%
Twin Cities Metro	52	27	79	34%
<b>Total</b>	<b>283</b>	<b>97</b>	<b>380</b>	<b>26%</b>



**2016–2022 data: Engaged in any *additional* planning with content specifically addressing climate adaptation and resilience**

Region	Never reported having	Reported having at least once	Total	Reported having at least once %
Greater Minnesota	386	146	532	27%
Twin Cities Metro	84	53	137	39%
<b>Total</b>	<b>480</b>	<b>218</b>	<b>698</b>	<b>31%</b>



**2022 data: 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	80	221	301	73%
Twin Cities Metro	14	65	79	82%
<b>Total</b>	<b>94</b>	<b>286</b>	<b>380</b>	<b>75%</b>



**2016–2022 data: 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	152	380	532	71%
Twin Cities Metro	21	116	137	85%
<b>Total</b>	<b>177</b>	<b>521</b>	<b>698</b>	<b>75%</b>

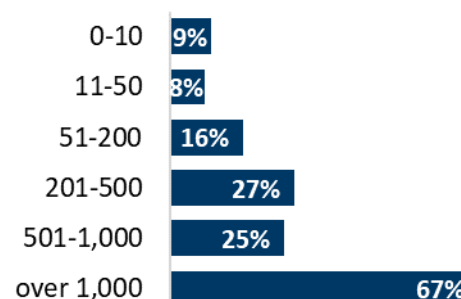


## Number of employees

While 380 organizations total responded to the 2022 survey, 17 of them did not answer the question about the number of employees in their organization. This appendix studies the 363 organizations that did answer the organizational size question. This section does not study the aggregate data because it is difficult to calculate. Organizations’ number of employees can change over time, and more than 50 organizations selected different categories in different years.

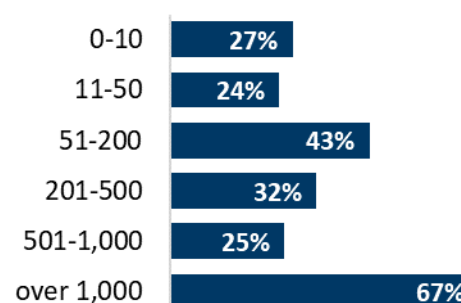
**2022 data: Engaged in *standalone* planning activity specifically to address climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	207	21	228	9%
11-50	58	5	63	8%
51-200	31	6	37	16%
201-500	16	6	22	27%
501-1,000	3	1	4	25%
over 1,000	3	6	9	67%
<b>Total</b>	<b>318</b>	<b>45</b>	<b>363</b>	<b>12%</b>



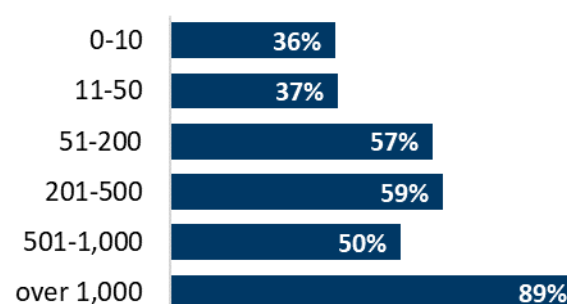
**2022 data: Engaged in *comprehensive* planning with content specifically addressing climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	167	61	228	27%
11-50	48	15	63	24%
51-200	21	16	37	43%
201-500	15	7	22	32%
501-1,000	3	1	4	25%
over 1,000	3	6	9	67%
<b>Total</b>	<b>257</b>	<b>106</b>	<b>363</b>	<b>29%</b>



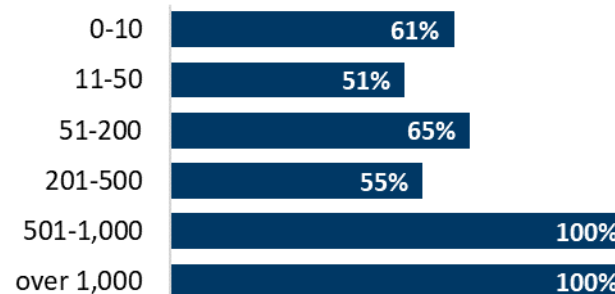
**2022 data: Engaged in *health/safety* planning with content specifically addressing climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	146	82	228	36%
11-50	40	23	63	37%
51-200	16	21	37	57%
201-500	9	13	22	59%
501-1,000	2	2	4	50%
over 1,000	1	8	9	89%
<b>Total</b>	<b>214</b>	<b>149</b>	<b>363</b>	<b>41%</b>



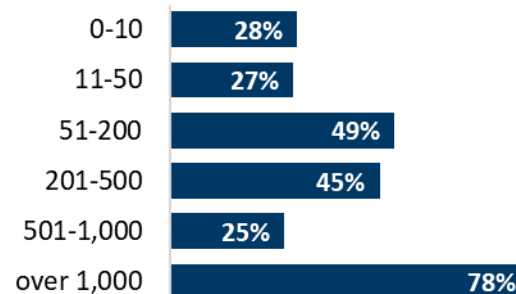
**2022 data: Engaged in *water* planning with content specifically addressing climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	88	140	228	61%
11-50	31	32	63	51%
51-200	13	24	37	65%
201-500	10	12	22	55%
501-1,000	0	4	4	100%
over 1,000	0	9	9	100%
<b>Total</b>	<b>142</b>	<b>221</b>	<b>363</b>	<b>61%</b>



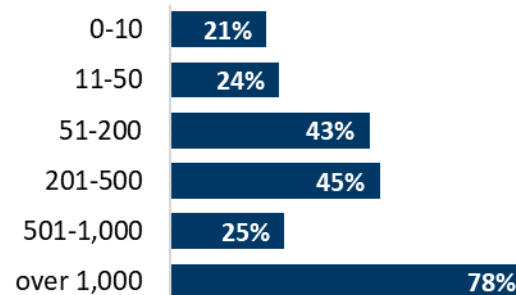
**2022 data: Engaged in *natural resources* planning with content specifically addressing climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	165	63	228	28%
11-50	46	17	63	27%
51-200	19	18	37	49%
201-500	12	10	22	45%
501-1,000	3	1	4	25%
over 1,000	2	7	9	78%
<b>Total</b>	<b>247</b>	<b>116</b>	<b>363</b>	<b>32%</b>



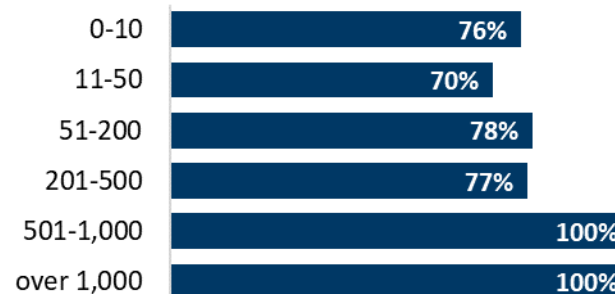
**2022 data: Engaged in any *additional* planning with content specifically addressing climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	180	48	228	21%
11-50	48	15	63	24%
51-200	21	16	37	43%
201-500	12	10	22	45%
501-1,000	3	1	4	25%
over 1,000	2	7	9	78%
<b>Total</b>	<b>266</b>	<b>97</b>	<b>363</b>	<b>27%</b>



2022 data: 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	55	173	228	76%
11–50	19	44	63	70%
51–200	8	29	37	78%
201–500	5	17	22	77%
501–1,000	0	4	4	100%
over 1,000	0	9	9	100%
<b>Total</b>	<b>87</b>	<b>276</b>	<b>363</b>	<b>76%</b>



## Appendix G: Survey results—cities by size

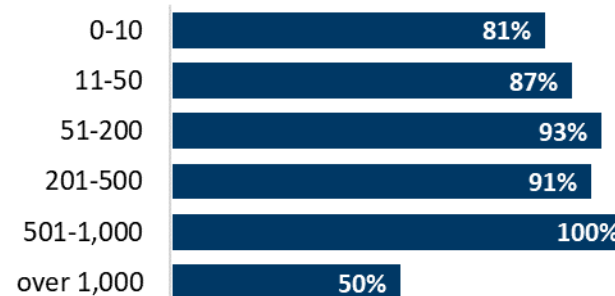
This appendix provides select 2022 survey results for responding cities.

### Results by size

While 240 cities total responded to the 2022 survey, 12 of them did not answer the question about the number of employees in their organization. This appendix studies the 228 cities that did answer the organizational size question.

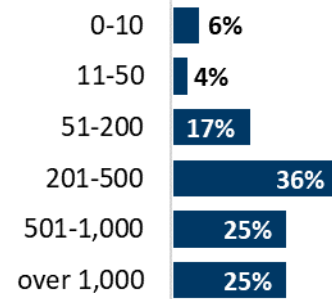
#### Experienced any event or trend connected to climate change

Org. employees	None	One or more	Total	One or more %
0–10	24	103	127	81%
11–50	7	46	53	87%
51–200	2	27	29	93%
201–500	1	10	11	91%
501–1,000	0	4	4	100%
over 1,000	2	2	4	50%
<b>Total</b>	<b>36</b>	<b>192</b>	<b>228</b>	<b>84%</b>



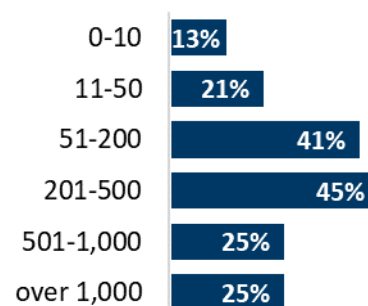
Engaged in *standalone* planning activity specifically to address climate adaptation and resilience

Org. employees	None	One or more	Total	One or more %
0-10	119	8	127	6%
11-50	51	2	53	4%
51-200	24	5	29	17%
201-500	7	4	11	36%
501-1,000	3	1	4	25%
over 1,000	3	1	4	25%
<b>Total</b>	<b>207</b>	<b>21</b>	<b>228</b>	<b>9%</b>



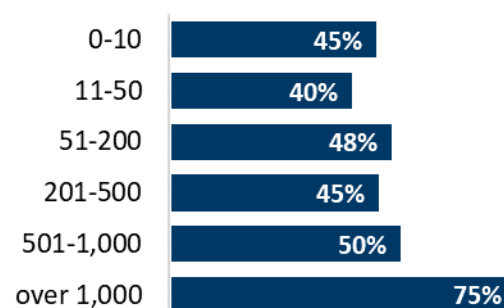
**Engaged in *comprehensive* planning with content specifically addressing climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	111	16	127	13%
11-50	42	11	53	21%
51-200	17	12	29	41%
201-500	6	5	11	45%
501-1,000	3	1	4	25%
over 1,000	3	1	4	25%
<b>Total</b>	<b>182</b>	<b>46</b>	<b>228</b>	<b>20%</b>



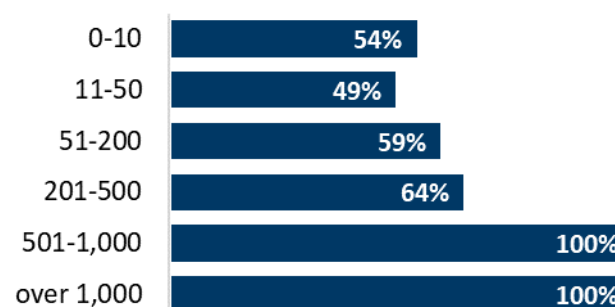
**Engaged in *health/safety* planning with content specifically addressing climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	70	57	127	45%
11-50	32	21	53	40%
51-200	15	14	29	48%
201-500	6	5	11	45%
501-1,000	2	2	4	50%
over 1,000	1	3	4	75%
<b>Total</b>	<b>126</b>	<b>102</b>	<b>228</b>	<b>45%</b>



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

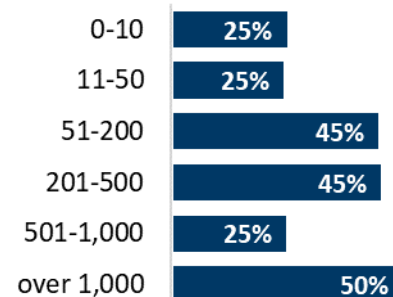
Org. employees	None	One or more	Total	One or more %
0-10	59	68	127	54%
11-50	27	26	53	49%
51-200	12	17	29	59%
201-500	4	7	11	64%
501-1,000	0	4	4	100%
over 1,000	0	4	4	100%
<b>Total</b>	<b>102</b>	<b>126</b>	<b>228</b>	<b>55%</b>





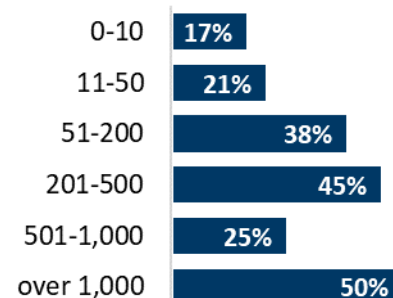
**Engaged in *natural resources planning* with content specifically addressing climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	95	32	127	25%
11-50	40	13	53	25%
51-200	16	13	29	45%
201-500	6	5	11	45%
501-1,000	3	1	4	25%
over 1,000	2	2	4	50%
<b>Total</b>	<b>162</b>	<b>66</b>	<b>228</b>	<b>50%</b>



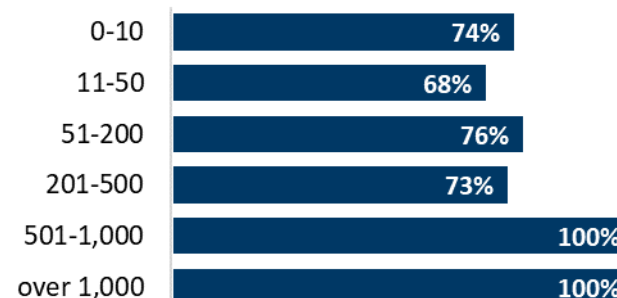
**Engaged in any *additional* planning with content specifically addressing climate adaptation and resilience**

Org. employees	None	One or more	Total	One or more %
0-10	106	21	127	17%
11-50	42	11	53	21%
51-200	18	11	29	38%
201-500	6	5	11	45%
501-1,000	3	1	4	25%
over 1,000	2	2	4	50%
<b>Total</b>	<b>177</b>	<b>51</b>	<b>228</b>	<b>22%</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	33	94	127	74%
11-50	17	36	53	68%
51-200	7	22	29	76%
201-500	3	8	11	73%
501-1,000	0	4	4	100%
over 1,000	0	4	4	100%
<b>Total</b>	<b>60</b>	<b>168</b>	<b>228</b>	<b>74%</b>



# Results by city population

The League of Minnesota Cities provided a spreadsheet about its member cities. The primary use of the spreadsheet was to obtain contact information for cities, but the spreadsheet also included population estimates for most cities.<sup>16</sup> Analyzing this data can show how well survey respondents reflected all Minnesota cities.

## 2022 results

Table 8 shows that the 2022 survey sample seems to reflect all Minnesota cities based on size. Overall, the distribution of cities that responded to the survey aligned with the distribution of cities invited; small cities comprised the vast majority of both groups.

**Table 8. 2022 survey data: Population of cities that responded to the survey and were invited to the survey**

City population	# cities responded	% cities responded	# cities invited	% cities invited
<5,000	200	83%	680	81%
5,000–9,999	15	6%	49	6%
10,000–24,999	10	4%	56	7%
25,000–49,999	9	4%	23	3%
50,000+	6	3%	20	2%
Unknown population	-	-	15	2%

In general, smaller cities had fewer plans than larger cities. All cities had an average of 4.4 plans, but cities with populations under 5,000 had an average of 3.4 plans. Cities larger than that had an average of 7.0 plans.

Small cities have fewer plans, and they less often reported having taken any of the actions listed in the survey. Ninety percent of cities with populations of 5,000 or more had taken at least one action, while only 58 percent of smaller cities said the same. When small cities had taken action, they averaged 1.2 actions, compared with large cities’ average of 5.6 actions.

When asked about what types of resources or assistance would be most helpful to their organizations, small and large cities’ priorities were mostly similar. Large cities picked almost all of the options at higher rates than small cities, but the most commonly picked resources were the same for both groups. For example, “financial assistance for construction of resilient infrastructure” was one of the two most common choices for both groups of cities, but 63 percent of large cities chose it, compared with 37 percent of small cities. The only option that small cities chose more often than large cities was “none of these.” Only 3 percent of large cities chose “none,” compared with 35 percent of small cities.

<sup>16</sup> It is unclear from the spreadsheet where the population estimates came from or how recent they are.

## Aggregate results

Table 9 shows that the aggregate survey sample across three years also seems to reflect all Minnesota cities based on size. Overall, the distribution of cities that responded to the survey aligned with the distribution of cities invited; small cities comprised the vast majority of both groups.

**Table 9. 2016–2022 survey data: Population of cities that responded to the survey and were invited to the survey<sup>17</sup>**

City population	# cities responded	% cities responded	# cities invited	% cities invited
<5,000	373	84%	701	81%
5,000–9,999	22	5%	51	6%
10,000–24,999	21	5%	57	7%
25,000–49,999	15	3%	23	3%
50,000+	15	3%	20	2%
Unknown population	-	-	12	1%

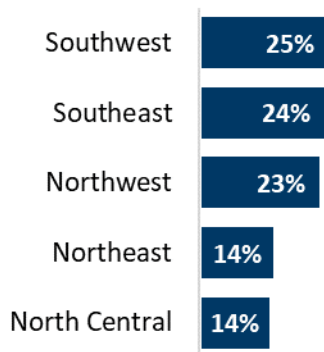
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<sup>17</sup> Four responding cities changed population buckets over the three survey years. In those cases, MAD allocated the cities to their 2022 population buckets. MAD allocated invited cities to their 2022 population bucket, or to their 2019 population bucket if 2022 data was not available.

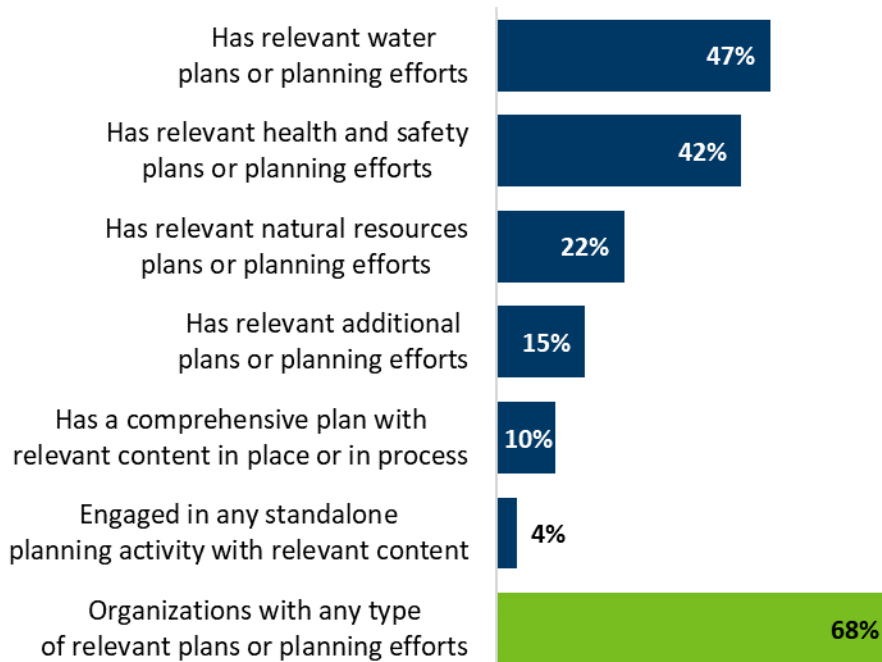
# Appendix H: Survey results—small cities and townships in Greater Minnesota

A large and potentially interesting subset of organizations that responded to the 2022 survey is the set of small cities and townships in Greater Minnesota. This appendix provides select survey results for cities and townships that indicated that they have 0–10 or 11–50 employees and are located in the Northeast, Northwest, North Central, Southwest, or Southeast MPCA region. Eight respondents did not select an organizational size. For these respondents, MAD identified them as relevant to this analysis if their municipality population was less than 5,000 and if their region was outside the Twin Cities metropolitan area. The percentages in this appendix are the percent of all respondents that fit into this category (182).

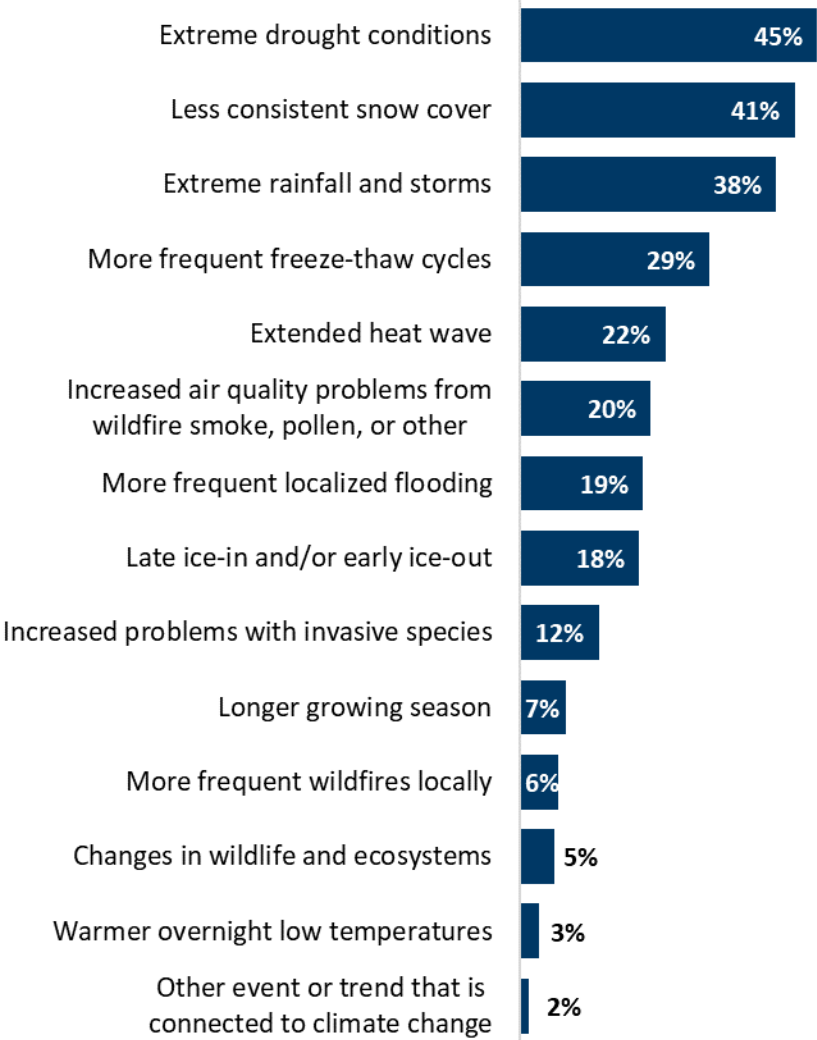
**Figure 32. 2022 survey data: Small cities and townships by region (n = 182)**



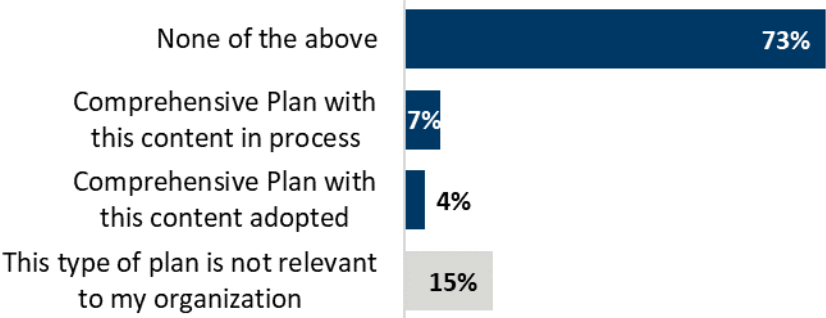
**Figure 33. 2022 survey data: Small cities’ and townships’ planning efforts by type of plan (n = 182)**



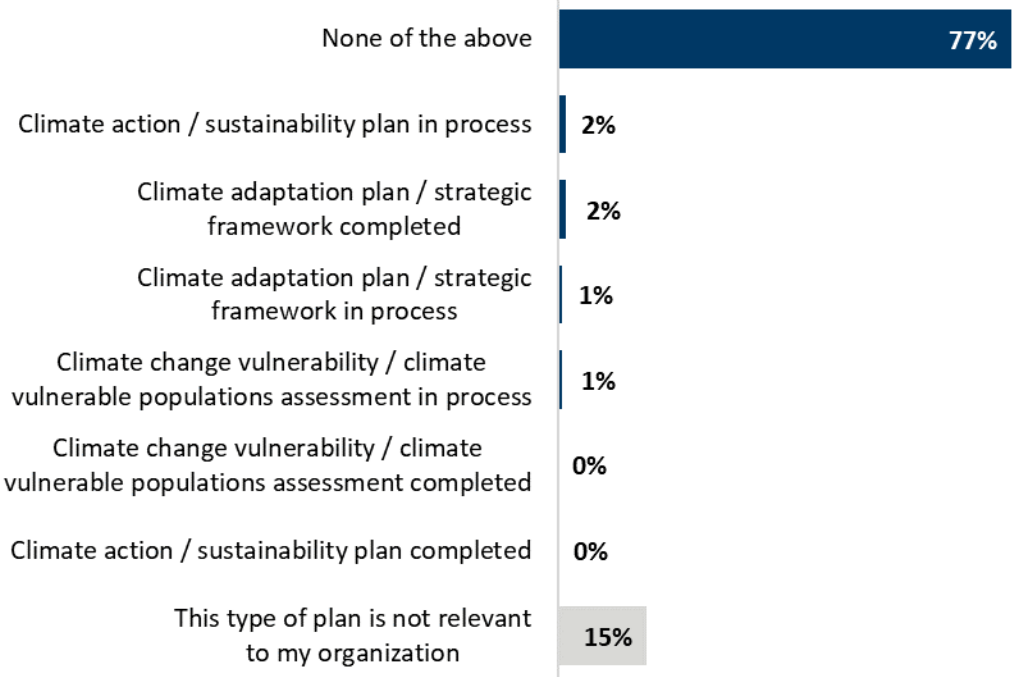
**Figure 34. 2022 survey data: The following types of *events and longer-term trends* are associated with the changing climate. During the past few years, which of the following have affected your community (e.g., residents, economy, infrastructure, natural resources)? Please select all that apply.**



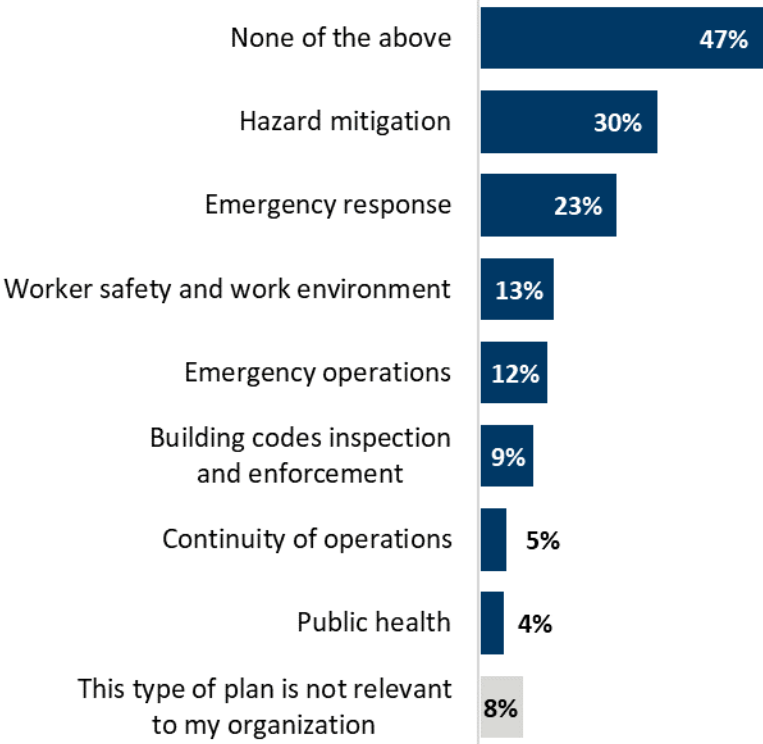
**Figure 35. 2022 survey data: Does your organization have a *comprehensive plan* with content that specifically addresses climate adaptation and resilience?**



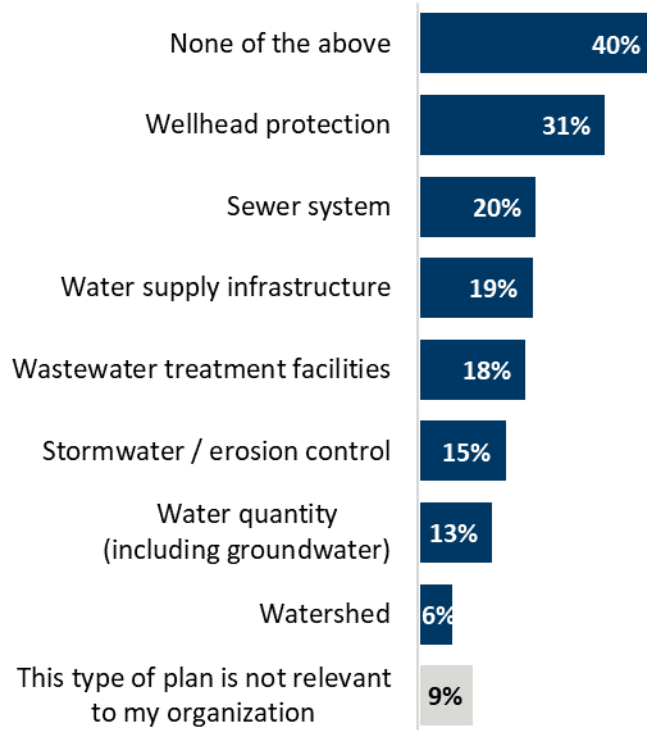
**Figure 36. 2022 survey data: Has your organization engaged in any of the following *standalone planning* efforts specifically to address climate adaptation and resilience? Please select all that apply.**



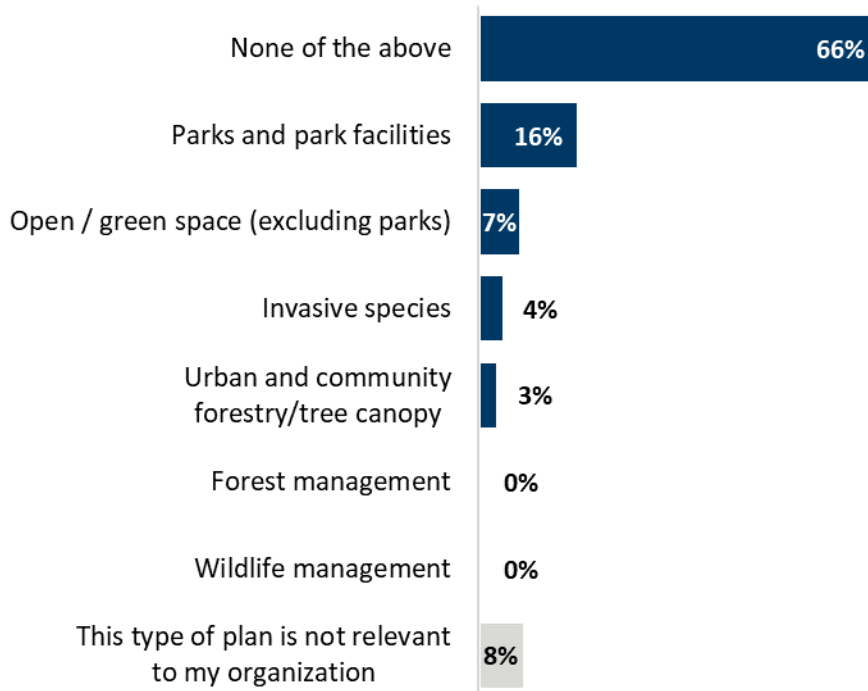
**Figure 37. 2022 survey data: Does your organization have any *health and safety plans* or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.**



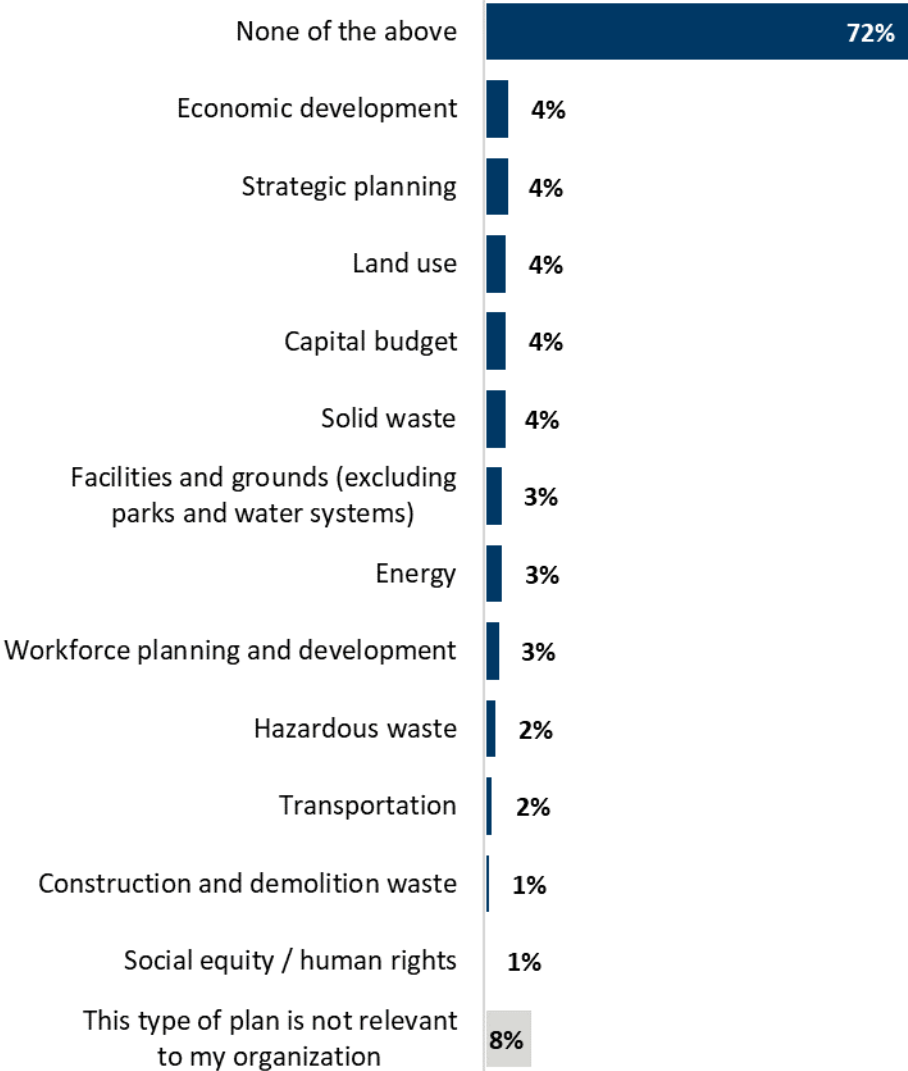
**Figure 38. 2022 survey data: Does your organization have any *water plans* or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.**



**Figure 39. 2022 survey data: Does your organization have any *natural resources plans* or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.**

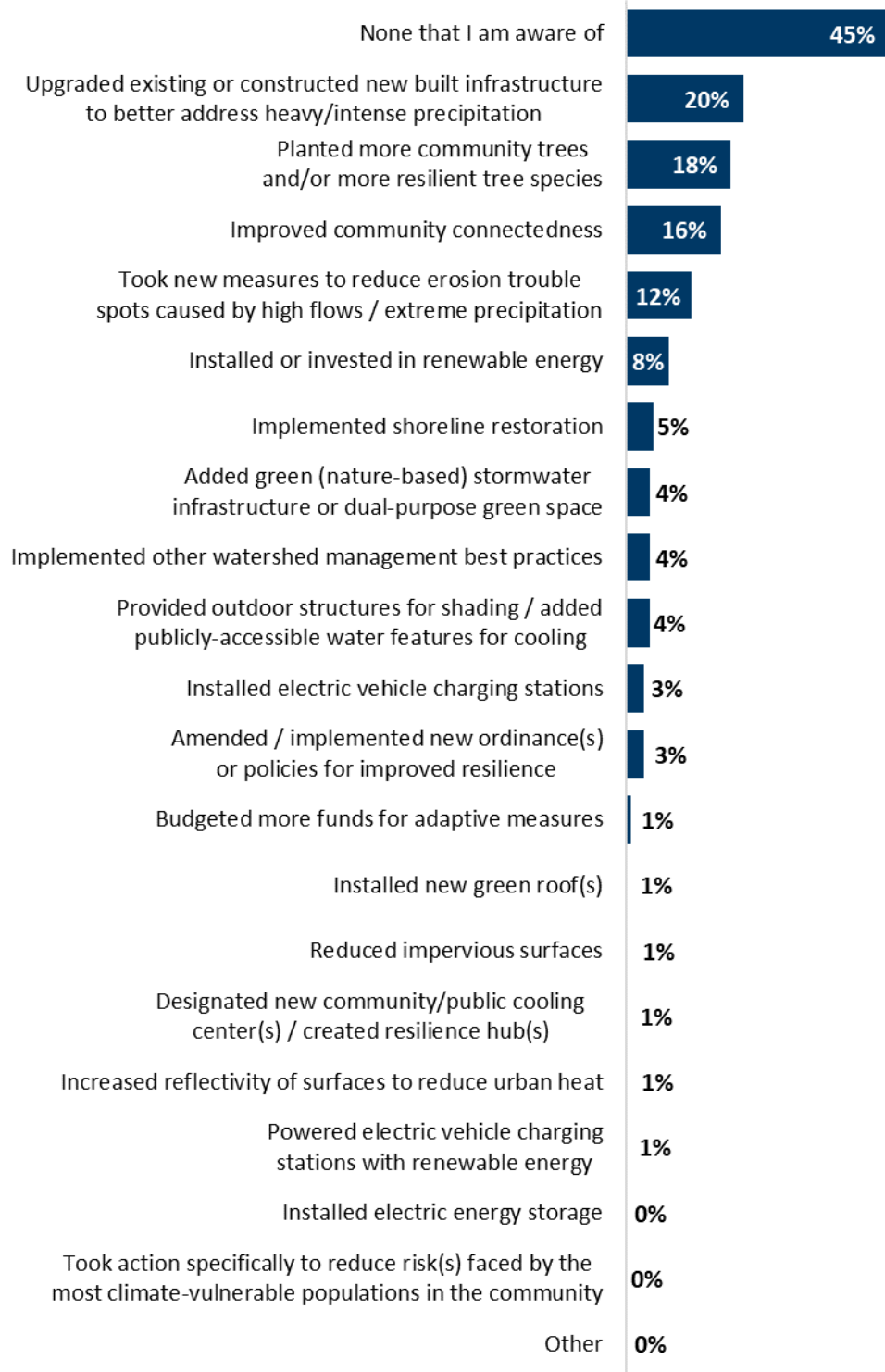


**Figure 40. 2022 survey data: Has your organization engaged in any *additional planning* efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.**

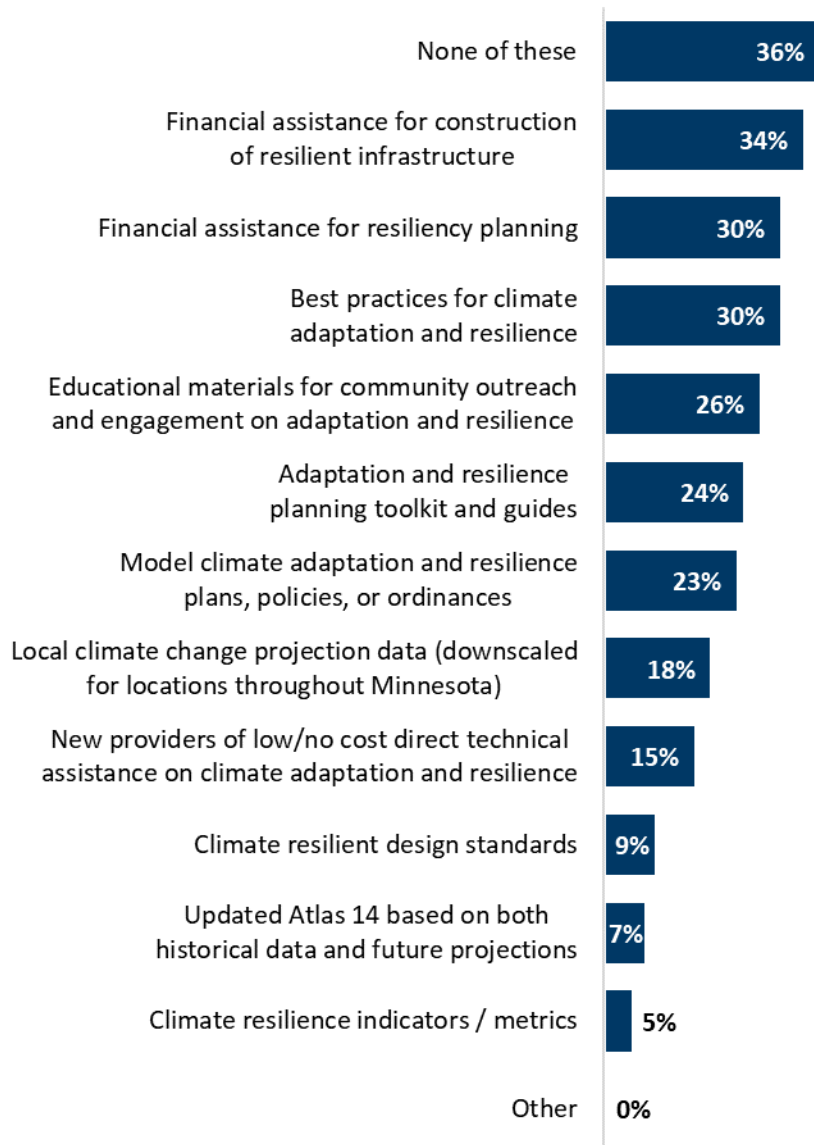




**Figure 41. 2022 survey data: In the past three (3) years, what actions has your organization taken to adapt/increase the resiliency of the community or environment to our changing climate? Please select all that apply. (This list focuses on tangible actions. We'll ask in later questions about any planning or assessments your organization has completed.)**



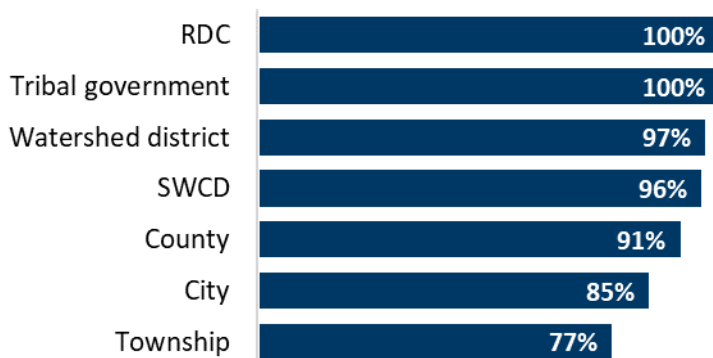
**Figure 42. 2022 survey data: What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please select all that apply.**



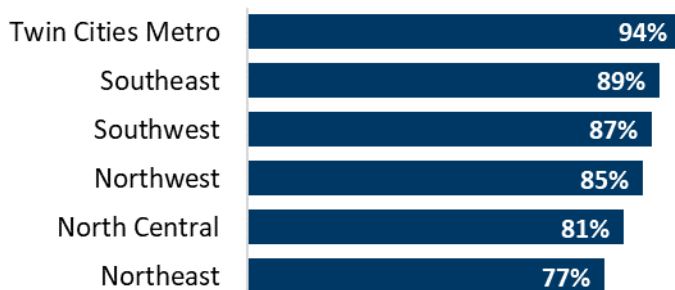
# Appendix I: Survey results—by experience with climate-related event or trend

This appendix explores organizations that have experienced climate-related events or trends. In the figures below, the percent shown represents the percentage of the 2022 survey responding organizations of that characteristic (e.g., 85 percent of responding cities have experienced a climate-related event or trend). In total, 331 organizations noticed a climate-related event or trend in 2022.

**Figure 43. 2022 survey data: Organizations that experienced one or more climate-related event/trend by type (n = 331)**



**Figure 44. 2022 survey data: Organizations that experienced one or more climate-related event/trend by region (n = 331)**

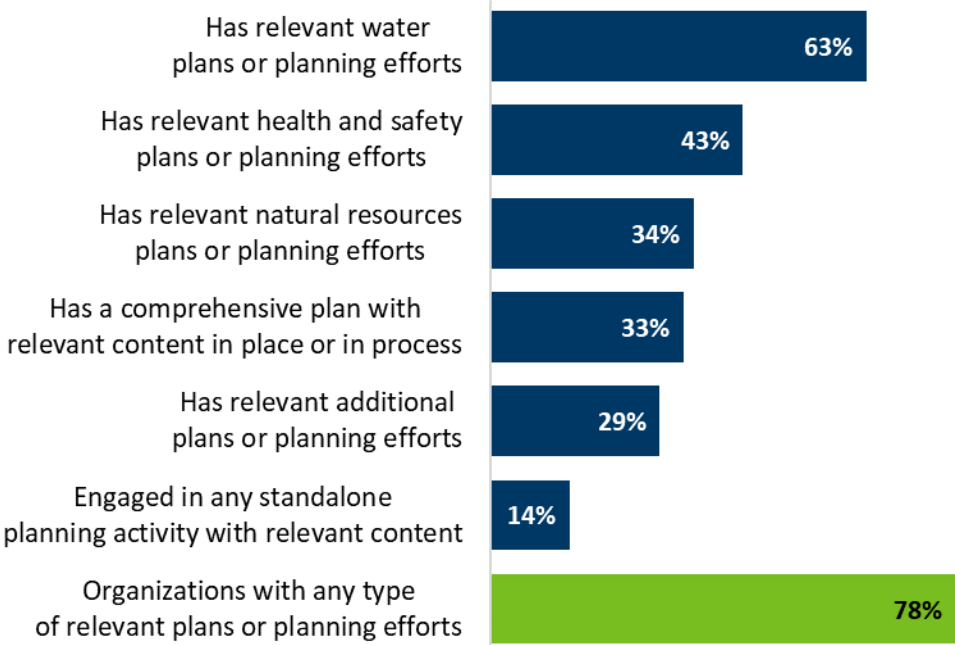


**Figure 45. 2022 survey data: Organizations that experienced one or more climate-related event/trend by size (n = 331)**



Figure 46 and Figure 47 show how many organizations in 2022 reported having different types of plans, split based on whether or not they had experienced a climate-related event or trend within the past few years. In general, organizations that have experienced climate-related events and trends have more often engaged in planning than organizations that have not experienced events and trends.

**Figure 46. 2022 survey data: Planning efforts of organizations that experienced climate-related event/trend (n = 331)**

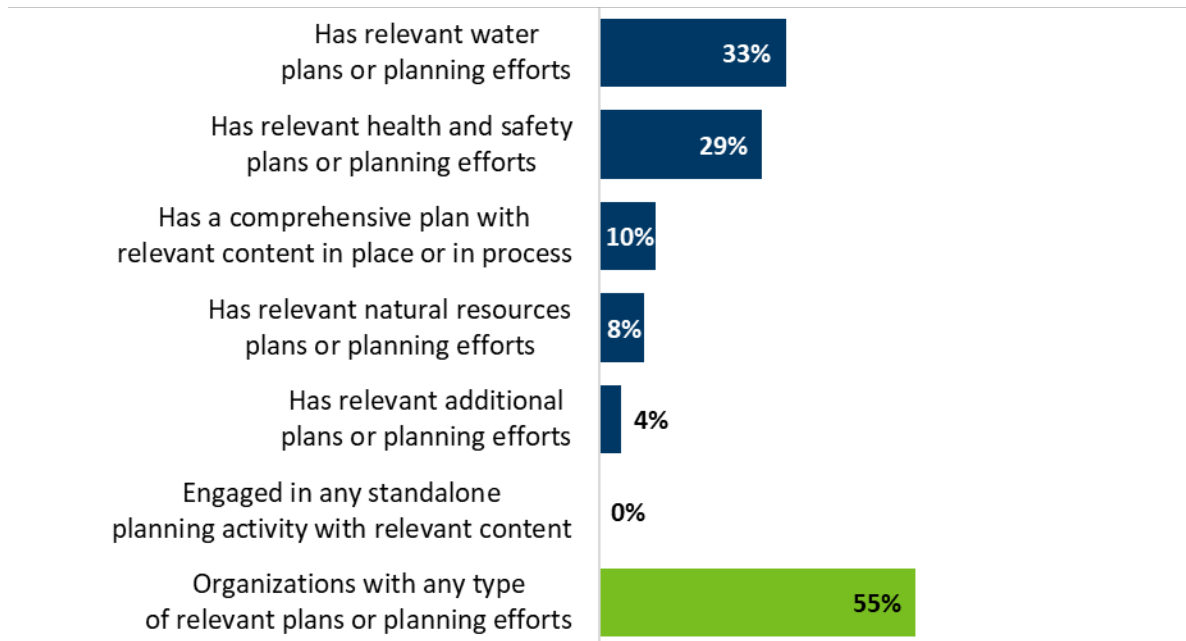


The percentages in Figure 46 are similar to those in the aggregate 2016–2022 dataset, as shown in Table 10. For some plan types, like health and safety plans, the 2022 dataset values are somewhat lower than the aggregate dataset.

**Table 10. Planning efforts among organizations that experienced a climate-related event/trend at least once**

Type of plan	2022	2016–2022
Water plans or planning efforts	63%	65%
Health and safety plans or planning efforts	43%	53%
Natural resources plans or planning efforts	34%	37%
Comprehensive plan with relevant content in place or in process	33%	31%
Additional plans or planning efforts	29%	35%
Standalone planning activity with relevant content	14%	16%
Any type of relevant plans or planning efforts	78%	80%

**Figure 47. 2022 survey data: Planning efforts of organizations that DID NOT identify climate-related event/trend (n = 49)**



The percentages in Figure 47 are generally similar to those in the aggregate 2016–2022 dataset, as shown in Table 11. However, the percentages in 2022 tended to be somewhat higher than the aggregate dataset.

**Table 11. Planning efforts among organizations that DID NOT experience a climate-related event/trend at least once**

Type of plan	2022	2016–2022
Water plans or planning efforts	33%	21%
Health and safety plans or planning efforts	29%	16%
Comprehensive plan with relevant content in place or in process	10%	5%
Natural resources plans or planning efforts	8%	4%
Additional plans or planning efforts	4%	2%
Standalone planning activity with relevant content	0%	0%
Any type of relevant plans or planning efforts	55%	32%

Those who had noticed climate events and trends more often reported taking the listed actions than those who had not noticed events and trends. The largest differences were for the actions “Planted more community trees and/or more resilient tree species” and “Took new measures to reduce erosion trouble spots caused by high flows/extreme precipitation.” More than 30 percent of respondents who had noticed climate-related events reported that they had taken these actions, compared with 10 percent or fewer of those who had not noticed a climate-related event.

**Table 12. 2022 survey data: Action taken, by respondents’ experience of climate events/trends**

<b>Action taken</b>	<b>% of all survey respondents</b>	<b>% of respondents that noticed climate events/trends</b>	<b>% of respondents that DID NOT notice climate events/trends</b>
Planted more community trees and/or more resilient tree species	29%	32%	10%
None that I am aware of	28%	24%	49%
Took new measures to reduce erosion trouble spots caused by high flows / extreme precipitation	27%	30%	8%
Improved community connectedness	26%	28%	6%
Implemented other watershed management best practices	25%	28%	8%
Upgraded existing or constructed new built infrastructure to better address heavy/intense precipitation	24%	26%	10%
Implemented shoreline restoration	22%	24%	8%
Added green (nature-based) stormwater infrastructure or dual-purpose green space	14%	16%	4%
Installed or invested in renewable energy	14%	16%	4%
Reduced impervious surfaces	10%	11%	2%
Installed electric vehicle charging stations	8%	9%	2%
Amended / implemented new ordinance(s) or policies for improved resilience	7%	8%	2%
Provided outdoor structures for shading / added publicly-accessible water features for cooling	6%	6%	2%
Budgeted more funds for adaptive measures	4%	5%	0%

<b>Action taken</b>	<b>% of all survey respondents</b>	<b>% of respondents that noticed climate events/trends</b>	<b>% of respondents that DID NOT notice climate events/trends</b>
Took action specifically to reduce risk(s) faced by the most climate-vulnerable populations in the community	4%	4%	0%
Powered electric vehicle charging stations with renewable energy	3%	3%	4%
Other	2%	2%	0%
Increased reflectivity of surfaces to reduce urban heat	2%	2%	0%
Installed new green roof(s)	1%	2%	0%
Designated new community/public cooling center(s) / created resilience hub(s)	1%	1%	0%
Installed electric energy storage	1%	1%	0%

# Appendix J: Survey results—by use of resources and partnerships

In total, 16 percent of respondents (59) to the 2022 survey said their organization had used at least one of the following resources or partnerships:

- Participate in the Minnesota GreenStep (GS) Program for Cities, Tribal Nations, or Schools
- Hosted a Minnesota GreenCorps (MNGC) member

Those who had used at least one of these resources or partnerships had a higher average number of plans (8.3) than those who had not (3.7).<sup>18</sup> They also more often had taken at least one of the actions listed (100 percent) than those who had not used one of the resources or partnerships (64 percent). Those who had used a resource or partnership had a higher average number of actions taken (5.7) than those who had not used a resource (1.7).

Table 13 shows that those who had used a resource more often reported taking the listed actions than those who had not used a resource. The largest difference was for the action “Planted more community trees and/or more resilient tree species.” Three-quarters of respondents who had used a resource reported that they had taken this action, compared with about one-fifth of those who had not used a resource.

**Table 13. 2022 survey data: Action taken, by respondents’ usage of specific resources**

Action taken	% of all survey respondents	% of those who had used GS or MNGC	% of those who had NOT used GS or MNGC
Planted more community trees and/or more resilient tree species	29%	75%	21%
None that I am aware of	28%	0%	33%
Took new measures to reduce erosion trouble spots caused by high flows/extreme precipitation	27%	49%	23%
Improved community connectedness (e.g., walkability, bikability, public gathering spaces, pedestrian safety)	26%	64%	18%
Implemented other watershed management best practices (e.g., habitat and stream connectivity, septic system improvements)	25%	46%	21%

<sup>18</sup> For this appendix, the grouping of organizations that had not used a listed resource includes both respondents who chose “None of the above” and respondents who did not answer the question.



<b>Action taken</b>	<b>% of all survey respondents</b>	<b>% of those who had used GS or MNGC</b>	<b>% of those who had NOT used GS or MNGC</b>
Upgraded existing or constructed new built infrastructure to better address heavy/intense precipitation (e.g., frequently flooded roadway, sewer capacity)	24%	41%	21%
Implemented shoreline restoration	22%	51%	17%
Added green (nature-based) stormwater infrastructure or dual-purpose green space	14%	39%	10%
Installed or invested in renewable energy (e.g., wind or solar installation, solar garden participation)	14%	41%	10%
Reduced impervious surfaces (e.g., installing permeable pavers, pervious concrete or porous asphalt, conversion to green space)	10%	32%	6%
Installed electric vehicle charging stations	8%	36%	3%
Amended/implemented new ordinance(s) or policies for improved resilience	7%	14%	6%
Provided outdoor structures for shading/added publicly-accessible water features for cooling	6%	19%	3%
Budgeted more funds for adaptive measures	4%	19%	2%
Took action specifically to reduce risk(s) faced by the most climate-vulnerable populations in the community	4%	14%	2%
Powered electric vehicle charging stations with renewable energy	3%	15%	1%
Other	2%	3%	1%
Increased reflectivity of surfaces to reduce urban heat (e.g., white roofs)	2%	7%	1%
Installed new green roof(s)	1%	3%	1%
Designated new community/public cooling center(s)/created resilience hub(s)	1%	5%	0%

Action taken	% of all survey respondents	% of those who had used GS or MNGC	% of those who had NOT used GS or MNGC
Installed electric energy storage	1%	2%	0%

Table 14 shows that those who had used a resource had different preferences for the types of assistance they would like. They more often chose every option listed except for “none of these.”

**Table 14. 2022 survey data: Desired assistance, by respondents’ usage of specific resources**

Desired assistance	% of all survey respondents	% of those who had used GS or MNGC	% of those who had NOT used GS or MNGC
Financial assistance for construction of resilient infrastructure	42%	76%	36%
Best practices for climate adaptation and resilience	42%	73%	36%
Financial assistance for resiliency planning	42%	80%	35%
Educational materials for community outreach and engagement on adaptation and resilience	36%	69%	29%
Adaptation and resilience planning toolkit and guides	31%	56%	27%
Model climate adaptation and resilience plans, policies, or ordinances	30%	56%	25%
Local climate change projection data (downscaled for locations throughout Minnesota)	29%	56%	24%
None of these	23%	2%	27%
Climate resilient design standards	22%	53%	16%
New providers of low/no cost direct technical assistance on climate adaptation and resilience	20%	37%	17%
Climate resilience indicators / metrics	16%	44%	11%
Updated Atlas 14 based on both historical data and future projections	16%	25%	14%
Other	2%	5%	1%

# Appendix K: Use of resources and partnerships

MPCA has a particular interest in how two of its programs, Minnesota GreenStep and Minnesota GreenCorps, may be affecting organizations' climate adaptation planning. MAD analyzed survey responses among two groups of respondents: participants in Minnesota GreenStep and organizations that hosted Minnesota GreenCorps members.

## Minnesota GreenStep

The tables and charts below illustrate the responses of organizations that identified themselves as participants in Minnesota GreenStep and those who did not. The majority of the 41 organizations identified as GreenStep participants are city governments, but several are other types of organizations (soil and water conservation districts, regional development organizations, and counties). For ease of analysis and comparison across the survey report, the data below show GreenStep participants and all non-GreenStep 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 taken by GreenStep participants and non-GreenStep organizations. In general, participants in GreenStep engage in more planning efforts than organizations that do not participate in GreenStep. The two groups were most closely matched in water planning efforts—66 percent of GreenStep participants and 58 percent of non-GreenStep organizations had some type of water plan or planning effort. For most other plan types, GreenStep participants had significantly higher rates. Standalone planning showed the biggest difference between groups; GreenStep participants engage in these planning activities 39 percentage points more often than non-GreenStep organizations.

**Figure 48. 2022 survey data: Overview of planning efforts**

	Non-GreenStep (n=339)		GreenStep (n=41)		% compare
	#	%	#	%	
Has a comprehensive plan with relevant content in place or in process	88	26%	25	61%	
Engaged in any standalone planning activity with relevant content	26	8%	19	46%	
Has relevant health and safety plans or planning efforts	131	39%	24	59%	
Has relevant water plans or planning efforts	198	58%	27	66%	
Has relevant natural resource plans or planning efforts	92	27%	26	63%	
Has additional relevant plans or planning efforts	73	22%	24	59%	
Organizations with any type of relevant plans or planning efforts	251	74%	35	85%	

**Figure 49. 2022 survey data: Comprehensive planning**

Does your organization have a <i>comprehensive plan</i> with content that specifically addresses climate adaptation and resilience?	Non-GreenStep (n=339)		GreenStep (n=41)		% compare
	#	%	#	%	
None of the above	208	61%	15	37%	
Comprehensive Plan with this content <i>adopted</i>	40	12%	17	41%	
Comprehensive Plan with this content <i>in process</i>	48	14%	8	20%	
This type of plan is not relevant to my organization.	39	12%	1	2%	

**Figure 50. 2022 survey data: Standalone planning**

Has your organization engaged in any of the following <i>standalone planning</i> efforts specifically to address climate adaptation and resilience? Please select all that apply.	Non-GreenStep (n=339)		GreenStep (n=41)		% compare
	#	%	#	%	
None of the above	263	78%	22	54%	
Climate adaptation plan / strategic framework <i>in process</i>	15	4%	6	15%	
Climate action / sustainability plan <i>in process</i>	12	4%	7	17%	
Climate change vulnerability / climate vulnerable populations assessment <i>in process</i>	9	3%	3	7%	
Climate action / sustainability plan <i>completed</i>	2	1%	9	22%	
Climate adaptation plan / strategic framework <i>completed</i>	4	1%	4	10%	
Climate change vulnerability / climate vulnerable populations assessment <i>completed</i>	1	0%	5	12%	
This type of plan is not relevant to my organization	38	11%	0	0%	

**Figure 51. 2022 survey data: Health and safety planning**

Does your organization have any <i>health and safety plans</i> or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.	Non-GreenStep (n=339)		GreenStep (n=41)		% compare
	#	%	#	%	
None of the above	156	46%	17	41%	
Hazard mitigation (e.g., FEMA-related)	93	27%	20	49%	
Emergency response	74	22%	15	37%	
Emergency operations	46	14%	12	29%	
Worker safety and work environment	36	11%	7	17%	
Building codes inspection and enforcement	31	9%	6	15%	
Continuity of operations	22	6%	7	17%	
Public health (e.g., vector-borne diseases, extreme heat, asthma/air quality.)	18	5%	5	12%	
This type of plan is not relevant to my organization	40	12%	0	0%	

**Figure 52. 2022 survey data: Water planning**

Does your organization have any <i>water plans</i> or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.	Non-GreenStep (n=339)		GreenStep (n=41)		% compare
	#	%	#	%	
None of the above	104	31%	13	32%	
Wellhead protection	101	30%	15	37%	
Stormwater / erosion control	90	27%	17	41%	
Watershed	93	27%	11	27%	
Water quantity (including groundwater)	70	21%	6	15%	
Sewer system	60	18%	7	17%	
Water supply infrastructure	54	16%	10	24%	
Wastewater treatment facilities	47	14%	9	22%	
This type of plan is not relevant to my organization	20	6%	1	2%	

**Figure 53. 2022 survey data: Natural resource planning**

Does your organization have any <i>natural resources plans</i> or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.	Non-GreenStep (n=339)		GreenStep (n=41)		% compare
	#	%	#	%	
None of the above	200	59%	13	32%	
Parks and park facilities	45	13%	15	37%	
Invasive species	39	12%	9	22%	
Open / green space (excluding parks)	31	9%	7	17%	
Urban and community forestry/tree canopy	18	5%	16	39%	
Forest management	15	4%	9	22%	
Wildlife management	14	4%	2	5%	
This type of plan is not relevant to my organization	29	9%	2	5%	

**Figure 54. 2022 survey data: Additional planning**

Has your organization engaged in any <i>additional planning</i> efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.	Non-GreenStep (n=339)		GreenStep (n=41)		% compare
	#	%	#	%	
None of the above	221	65%	17	41%	
Land use	35	10%	11	27%	
Strategic planning	24	7%	12	29%	
Energy	14	4%	15	37%	
Economic development	20	6%	6	15%	
Capital budget	17	5%	8	20%	
Solid waste	19	6%	6	15%	
Transportation (e.g., roads, multimodal)	13	4%	11	27%	
Facilities and grounds (excluding parks and water systems)	13	4%	8	20%	
Construction and demolition waste	12	4%	3	7%	
Workforce planning and development	9	3%	5	12%	
Hazardous waste	10	3%	2	5%	
Social equity / human rights	4	1%	7	17%	
These types of plans are not relevant to my organization	26	8%	0	0%	

## Actions taken

The figure on the following page shows the types of actions taken to increase resiliency. In general, GreenStep participants were more likely to have taken an action than other types of survey respondents. The largest differences were “Improved community connectedness (e.g., walkability, bikability, public gathering spaces, pedestrian safety)” and “Planted more community trees and/or more resilient tree species;” more than three-quarters of responding GreenStep participants had taken these actions, compared with less than one-quarter of non-GreenStep organizations.

GreenStep participants, on average, took more actions to increase resiliency than survey respondents as a whole. As noted in Appendix J, those organizations who had used a resource took an average of 5.7 actions, and those who had not used a resource took an average of 1.7 actions. By comparison, GreenStep participants took an average of 6.1 actions.

**Figure 55. 2022 survey data: Actions taken**

In the past three (3) years, what actions has your organization taken to adapt / increase the resiliency of the community or environment to our changing climate? Please select all that apply.	Non-GreenStep (n=339)		GreenStep (n=41)		% compare
	#	%	#	%	
Planted more community trees and/or more resilient tree species	80	24%	32	78%	
None that I am aware of	105	31%	0	0%	
Took new measures to reduce erosion trouble spots caused by high flows / extreme precipitation	88	26%	15	37%	
Improved community connectedness (e.g., walkability, bikability, public gathering spaces, pedestrian safety)	63	19%	34	83%	
Implemented other watershed management best practices (e.g., habitat and stream connectivity, septic system improvements)	81	24%	15	37%	
Upgraded existing or constructed new built infrastructure to better address heavy/intense precipitation (e.g., frequently flooded roadway, sewer capacity)	74	22%	17	41%	
Implemented shoreline restoration	71	21%	13	32%	
Added green (nature-based) stormwater infrastructure or dual-purpose green space	39	12%	16	39%	
Installed or invested in renewable energy (e.g., wind or solar installation, solar garden participation)	33	10%	22	54%	
Reduced impervious surfaces (e.g., installing permeable pavers, pervious concrete or porous asphalt, conversion to green space)	23	7%	14	34%	
Installed electric vehicle charging stations	12	4%	20	49%	
Amended / implemented new ordinance(s) or policies for improved resilience	19	6%	7	17%	
Provided outdoor structures for shading / added publicly-accessible water features for cooling	12	4%	10	24%	
Budgeted more funds for adaptive measures	9	3%	8	20%	
Took action specifically to reduce risk(s) faced by the most climate-vulnerable populations in the community	7	2%	7	17%	
Powered electric vehicle charging stations with renewable energy	3	1%	8	20%	
Increased reflectivity of surfaces to reduce urban heat (e.g., white roofs)	2	1%	4	10%	
Other	4	1%	2	5%	
Installed new green roof(s)	3	1%	2	5%	
Designated new community/public cooling center(s) / created resilience hub(s)	2	1%	2	5%	
Installed electric energy storage	1	0%	1	2%	



## Desired assistance

The figure below shows the types of assistance organizations identified as most helpful to make progress on climate adaptation and resilience. Compared with non-GreenStep organizations, GreenStep participants more frequently selected all of the listed options except “None of these.”

**Figure 56. 2022 survey data: Desired assistance**

What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please select all that apply.	Non-GreenStep (n=339)		GreenStep (n=41)		% compare
	#	%	#	%	
Financial assistance for construction of resilient infrastructure	129	38%	32	78%	
Best practices for climate adaptation and resilience	132	39%	27	66%	
Financial assistance for resiliency planning	127	37%	31	76%	
Educational materials for community outreach and engagement on adaptation and resilience	107	32%	28	68%	
Adaptation and resilience planning toolkit and guides	95	28%	24	59%	
Model climate adaptation and resilience plans, policies, or ordinances	88	26%	25	61%	
Local climate change projection data (downscaled for locations throughout Minnesota)	89	26%	22	54%	
None of these	88	26%	1	2%	
Climate resilient design standards	61	18%	22	54%	
New providers of low/no cost direct technical assistance on climate adaptation and resilience	59	17%	16	39%	
Climate resilience indicators / metrics	43	13%	19	46%	
Updated Atlas 14 based on both historical data and future projections	51	15%	9	22%	
Other	4	1%	2	5%	

# Organizations that hosted Minnesota GreenCorps members

The following tables and charts illustrate the responses of organizations that identified themselves as having hosted a Minnesota GreenCorps member and those who did not. In total, 34 organizations identified as having hosted a Minnesota GreenCorps member. The data below show these respondents compared with 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 taken by organizations that had and had not hosted a Minnesota GreenCorps member. In general, Minnesota GreenCorps hosts engage in more planning efforts than organizations that did not host a member. The two groups were most closely matched in health and safety planning efforts—56 percent of Minnesota GreenCorps hosts and 39 percent of organizations that did not host a member had some type of health and safety plan or planning effort.

**Figure 57. 2022 survey data: Overview of planning efforts**

	Not MN GreenCorps Hosts (n=346)		MN GreenCorps Hosts (n=34)		% compare
	#	%	#	%	
Has a comprehensive plan with relevant content in place or in process	92	27%	21	62%	
Engaged in any standalone planning activity with relevant content	27	8%	18	53%	
Has relevant health and safety plans or planning efforts	136	39%	19	56%	
Has relevant water plans or planning efforts	198	57%	27	79%	
Has relevant natural resource plans or planning efforts	96	28%	22	65%	
Has additional relevant plans or planning efforts	77	22%	20	59%	
Organizations with any type of relevant plans or planning efforts	254	73%	32	94%	

**Figure 58. 2022 survey data: Comprehensive planning**

Does your organization have a <i>comprehensive plan</i> with content that specifically addresses climate adaptation and resilience?	Not MN GreenCorps Hosts (n=346)		MN GreenCorps Hosts (n=34)		% compare
	#	%	#	%	
None of the above	208	60%	15	44%	
Comprehensive Plan with this content <i>adopted</i>	40	12%	17	50%	
Comprehensive Plan with this content <i>in process</i>	48	14%	8	24%	
This type of plan is not relevant to my organization.	39	11%	1	3%	

**Figure 59. 2022 survey data: Standalone planning**

Has your organization engaged in any of the following <i>standalone planning</i> efforts specifically to address climate adaptation and resilience? Please select all that apply.	Not MN GreenCorps Hosts (n=346)		MN GreenCorps Hosts (n=34)		% compare
	#	%	#	%	
None of the above	263	76%	22	65%	
Climate adaptation plan / strategic framework <i>in process</i>	15	4%	6	18%	
Climate action / sustainability plan <i>in process</i>	12	3%	7	21%	
Climate change vulnerability / climate vulnerable populations assessment <i>in process</i>	9	3%	3	9%	
Climate action / sustainability plan <i>completed</i>	2	1%	9	26%	
Climate adaptation plan / strategic framework <i>completed</i>	4	1%	4	12%	
Climate change vulnerability / climate vulnerable populations assessment <i>completed</i>	1	0%	5	15%	
This type of plan is not relevant to my organization	38	11%	0	0%	

**Figure 60. 2022 survey data: Health and safety planning**

Does your organization have any <i>health and safety plans</i> or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.	Not MN GreenCorps Hosts (n=346)		MN GreenCorps Hosts (n=34)		% compare
	#	%	#	%	
None of the above	156	45%	17	50%	
Hazard mitigation (e.g., FEMA-related)	93	27%	20	59%	
Emergency response	74	21%	15	44%	
Emergency operations	46	13%	12	35%	
Worker safety and work environment	36	10%	7	21%	
Building codes inspection and enforcement	31	9%	6	18%	
Continuity of operations	22	6%	7	21%	
Public health (e.g., vector-borne diseases, extreme heat, asthma/air quality.)	18	5%	5	15%	
This type of plan is not relevant to my organization	40	12%	0	0%	

**Figure 61. 2022 survey data: Water planning**

Does your organization have any <i>water plans</i> or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.	Not MN GreenCorps Hosts (n=346)		MN GreenCorps Hosts (n=34)		% compare
	#	%	#	%	
None of the above	104	30%	13	38%	
Wellhead protection	101	29%	15	44%	
Stormwater / erosion control	90	26%	17	50%	
Watershed	93	27%	11	32%	
Water quantity (including groundwater)	70	20%	6	18%	
Sewer system	60	17%	7	21%	
Water supply infrastructure	54	16%	10	29%	
Wastewater treatment facilities	47	14%	9	26%	
This type of plan is not relevant to my organization	20	6%	1	3%	

**Figure 62. 2022 survey data: Natural resource planning**

Does your organization have any <i>natural resources plans</i> or planning efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.	Not MN GreenCorps Hosts (n=346)		MN GreenCorps Hosts (n=34)		% compare
	#	%	#	%	
None of the above	200	58%	13	38%	
Parks and park facilities	45	13%	15	44%	
Invasive species	39	11%	9	26%	
Open / green space (excluding parks)	31	9%	7	21%	
Urban and community forestry/tree canopy	18	5%	16	47%	
Forest management	15	4%	9	26%	
Wildlife management	14	4%	2	6%	
This type of plan is not relevant to my organization	29	8%	2	6%	

**Figure 63. 2022 survey data: Additional planning**

Has your organization engaged in any <i>additional planning</i> efforts with content that specifically addresses climate adaptation and resilience? Please select all that apply.	Not MN GreenCorps Hosts (n=346)		MN GreenCorps Hosts (n=34)		% compare
	#	%	#	%	
None of the above	221	64%	17	50%	
Land use	35	10%	11	32%	
Strategic planning	24	7%	12	35%	
Energy	14	4%	15	44%	
Economic development	20	6%	6	18%	
Capital budget	17	5%	8	24%	
Solid waste	19	5%	6	18%	
Transportation (e.g., roads, multimodal)	13	4%	11	32%	
Facilities and grounds (excluding parks and water systems)	13	4%	8	24%	
Construction and demolition waste	12	3%	3	9%	
Workforce planning and development	9	3%	5	15%	
Hazardous waste	10	3%	2	6%	
Social equity / human rights	4	1%	7	21%	
These types of plans are not relevant to my organization	26	8%	0	0%	

## Actions taken

The figure on the following page shows the types of actions taken to increase resiliency. In general, Minnesota GreenCorps hosts were more likely to have taken an action than organizations that did not host a member. The largest differences were “Improved community connectedness (e.g., walkability, bikability, public gathering spaces, pedestrian safety)” and “Planted more community trees and/or more resilient tree species”; all or almost all responding Minnesota GreenCorps hosts had taken these actions, compared with less than one-quarter of organizations that did not host.

Minnesota GreenCorps hosts, on average, took more actions to increase resilience than survey respondents as a whole. As noted in Appendix J, those organizations who had used one or both of the resources or partnerships took an average of 5.7 actions, and those who had not took an average of 1.7 actions. By comparison, Minnesota GreenCorps hosts took an average of 6.4 actions.

**Figure 64. 2022 survey data: Actions taken**

In the past three (3) years, what actions has your organization taken to adapt / increase the resiliency of the community or environment to our changing climate? Please select all that apply.	Not MN GreenCorps Hosts (n=346)		MN GreenCorps Hosts (n=34)		% compare
	#	%	#	%	
Planted more community trees and/or more resilient tree species	80	23%	32	94%	
None that I am aware of	105	30%	0	0%	
Took new measures to reduce erosion trouble spots caused by high flows / extreme precipitation	88	25%	15	44%	
Improved community connectedness (e.g., walkability, bikability, public gathering spaces, pedestrian safety)	63	18%	34	100%	
Implemented other watershed management best practices (e.g., habitat and stream connectivity, septic system improvements)	81	23%	15	44%	
Upgraded existing or constructed new built infrastructure to better address heavy/intense precipitation (e.g., frequently flooded roadway, sewer capacity)	74	21%	17	50%	
Implemented shoreline restoration	71	21%	13	38%	
Added green (nature-based) stormwater infrastructure or dual-purpose green space	39	11%	16	47%	
Installed or invested in renewable energy (e.g., wind or solar installation, solar garden participation)	33	10%	22	65%	
Reduced impervious surfaces (e.g., installing permeable pavers, pervious concrete or porous asphalt, conversion to green space)	23	7%	14	41%	
Installed electric vehicle charging stations	12	3%	20	59%	
Amended / implemented new ordinance(s) or policies for improved resilience	19	5%	7	21%	
Provided outdoor structures for shading / added publicly-accessible water features for cooling	12	3%	10	29%	
Budgeted more funds for adaptive measures	9	3%	8	24%	
Took action specifically to reduce risk(s) faced by the most climate-vulnerable populations in the community	7	2%	7	21%	
Powered electric vehicle charging stations with renewable energy	3	1%	8	24%	
Increased reflectivity of surfaces to reduce urban heat (e.g., white roofs)	2	1%	4	12%	
Other	4	1%	2	6%	
Installed new green roof(s)	3	1%	2	6%	
Designated new community/public cooling center(s) / created resilience hub(s)	2	1%	2	6%	
Installed electric energy storage	1	0%	1	3%	

## Desired assistance

The figure below shows the types of resources organizations identified as most helpful to make progress on climate adaptation and resilience. Compared with organizations that did not host Minnesota GreenCorps members, Minnesota GreenCorps hosts more frequently selected all of the listed options except “None of these.”

**Figure 65. 2022 survey data: Desired assistance**

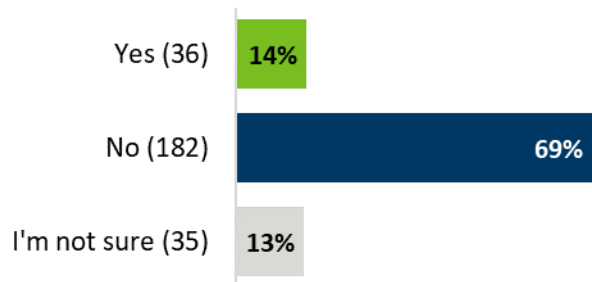
What kind of resources or assistance would be most helpful to your organization to make progress on climate adaptation and resilience? Please select all that apply.	Not MN GreenCorps Hosts (n=346)		MN GreenCorps Hosts (n=34)		% compare	
	#	%	#	%		
Financial assistance for construction of resilient infrastructure	129	37%	32	94%		
Best practices for climate adaptation and resilience	132	38%	27	79%		
Financial assistance for resiliency planning	127	37%	31	91%		
Educational materials for community outreach and engagement on adaptation and resilience	107	31%	28	82%		
Adaptation and resilience planning toolkit and guides	95	27%	24	71%		
Model climate adaptation and resilience plans, policies, or ordinances	88	25%	25	74%		
Local climate change projection data (downscaled for locations throughout Minnesota)	89	26%	22	65%		
None of these	88	25%	1	3%		
Climate resilient design standards	61	18%	22	65%		
New providers of low/no cost direct technical assistance on climate adaptation and resilience	59	17%	16	47%		
Climate resilience indicators / metrics	43	12%	19	56%		
Updated Atlas 14 based on both historical data and future projections	51	15%	9	26%		
Other	4	1%	2	6%		



# Appendix L: Action as a result of planning

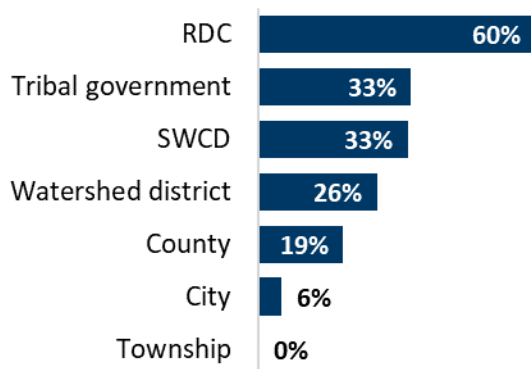
This appendix explores organizations that said one of the actions was a direct result of a written plan that addressed climate adaptation and resilience. Overall, 14 percent of respondents answered that one of their actions taken was a direct result of a written plan.

**Figure 66. 2022 survey data: Were any of the actions you took a direct result of a written plan that addressed climate adaptation and resilience?**

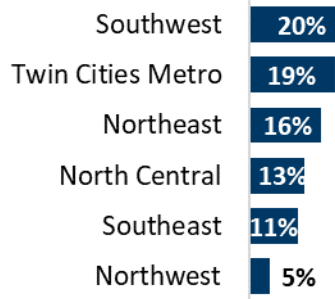


The figures below explore the characteristics of the 14 percent of respondents that answered yes. The percent shown represents the percentage of responding organizations of that characteristic that answered the question (e.g., 60 percent of RDCs that answered the question said one of their actions was a direct result of a written plan).

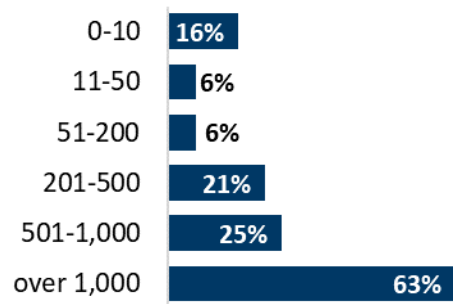
**Figure 67. 2022 survey data: Organizations that took action as a result of a written plan by type (n = 36)**



**Figure 68. 2022 survey data: Organizations that took action as a result of a written plan by region (n = 36)**



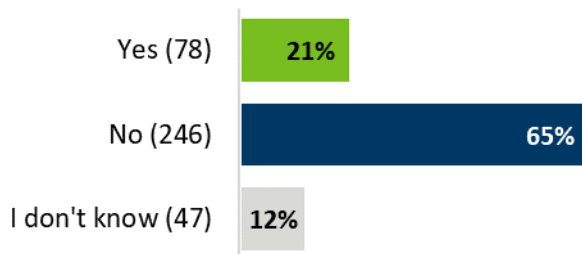
**Figure 69. 2022 survey data: Organizations that took action as a result of a written plan by number of employees (n = 36)**



# Appendix M: Governmental collaboration

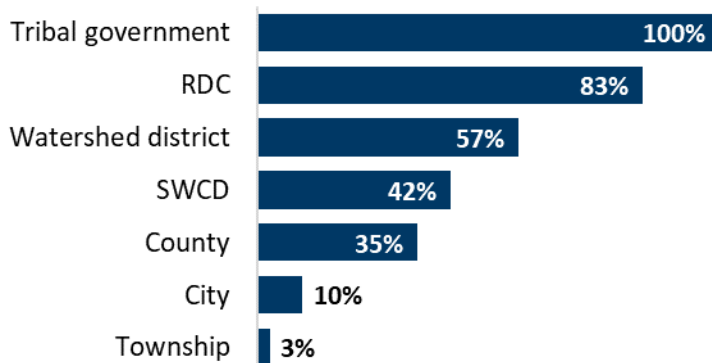
This appendix explores organizations that have coordinated with any other local/regional/tribal governmental organization(s) on climate adaptation and resilience planning or implementation. Overall, 21 percent of respondents answered that they had coordinated with others.

**Figure 70. 2022 survey data: Has your organization coordinated with any other local/regional/tribal governmental organization(s) within Minnesota on climate adaptation and resilience planning or implementation?**

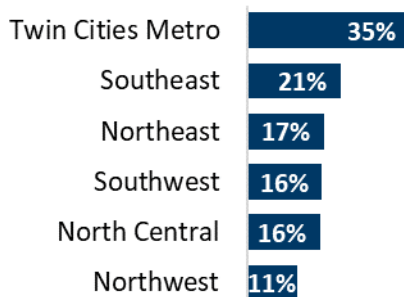


The figures below explore the characteristics of the 14 percent of respondents that answered yes. The percent shown represents the percentage of responding organizations of that characteristic (e.g., 10 percent of responding cities have coordinated with another governmental entity on this topic).

**Figure 71. 2022 survey data: Organizations that coordinated on planning or implementation by type (n = 78)**



**Figure 72. 2022 survey data: Organizations that coordinated on planning or implementation by region (n = 78)**



**Figure 73. 2022 survey data: Organizations that coordinated on planning or implementation by number of employees (n = 78)**

