



Management
Analysis
& Development

**Minnesota Pollution Control
Agency for the Interagency
Climate Adaptation Team**

**Climate Adaptation
Planning Survey**

August 2016

■ Minnesota Management & Budget, 203 Administration Building, 50 Sherburne Avenue, St. Paul, MN 55155
Telephone: 651-259-3800 Fax: 651-797-1311 Website: mn.gov/mmb/mad

Division director

Kristin Batson

Assistant division director

Beth Bibus

MAD project lead

Beth Bibus

MPCA project team

Paul Moss

Laura Milberg

Kevin McDonald

Contact information

Telephone: 651-259-3800

Email: Management.Analysis@state.mn.us

Fax: 651-797-1311

Website: mn.gov/mmb/mad

Address: 203 Administration Building

50 Sherburne Avenue

St. Paul, Minnesota 55155

Copies of this report

For more information or copies of this report, contact Paul Moss, Minnesota Pollution Control Agency, 651-296-6300 or 800-657-3864, or paul.moss@state.mn.us.

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Executive Summary

Background

The Minnesota Pollution Control Agency (MPCA) has the lead role in data collection for the Interagency Climate Adaptation Team's (ICAT's) statewide indicator to measure progress on climate adaptation and resilience planning in governmental organizations. To develop this indicator, MPCA asked Management Analysis & Development (MAD) to develop, administer, and analyze an online survey of Minnesota cities, counties, watershed districts, soil and water conservation districts, tribal governments, and relevant state agencies.

MAD worked with a team of experts from MPCA to design the survey and conduct analyses that would be useful to ICAT.

The primary purposes of the survey were:

- Develop an estimate of the extent of government agencies' planning efforts that could serve as ICAT's indicator
- Learn more about the types of climate adaptation and resilience planning efforts by governmental organizations
- Gain information about what types of resources might be useful to governmental organizations engaged in climate adaptation and resilience planning

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

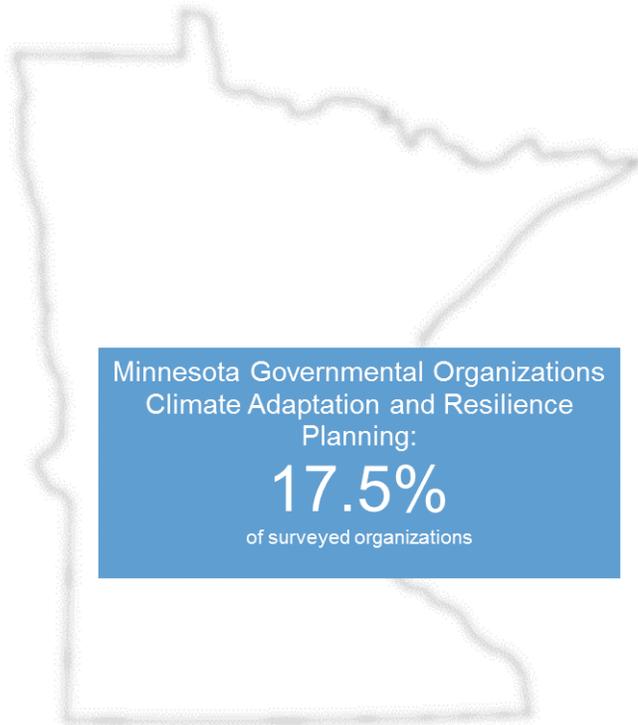
Key survey findings

This is the first Minnesota statewide survey of climate adaptation and resilience planning. Over 1,000 Minnesota cities, counties, tribal governments, watershed districts, soil and water conservation districts, and key state agencies received the survey, with about 30% responding. Though the responding organizations may not be completely reflective of the state as a whole, the data from the survey can provide useful information to ICAT.

Statewide indicator

A realistic indicator of statewide planning efforts can be calculated using survey data: 17.5% of surveyed organizations (a better indicator than responding organizations) report that they have at least one type of plan or planning effort with content that specifically addresses climate adaptation and resilience.

Figure 1. Statewide indicator



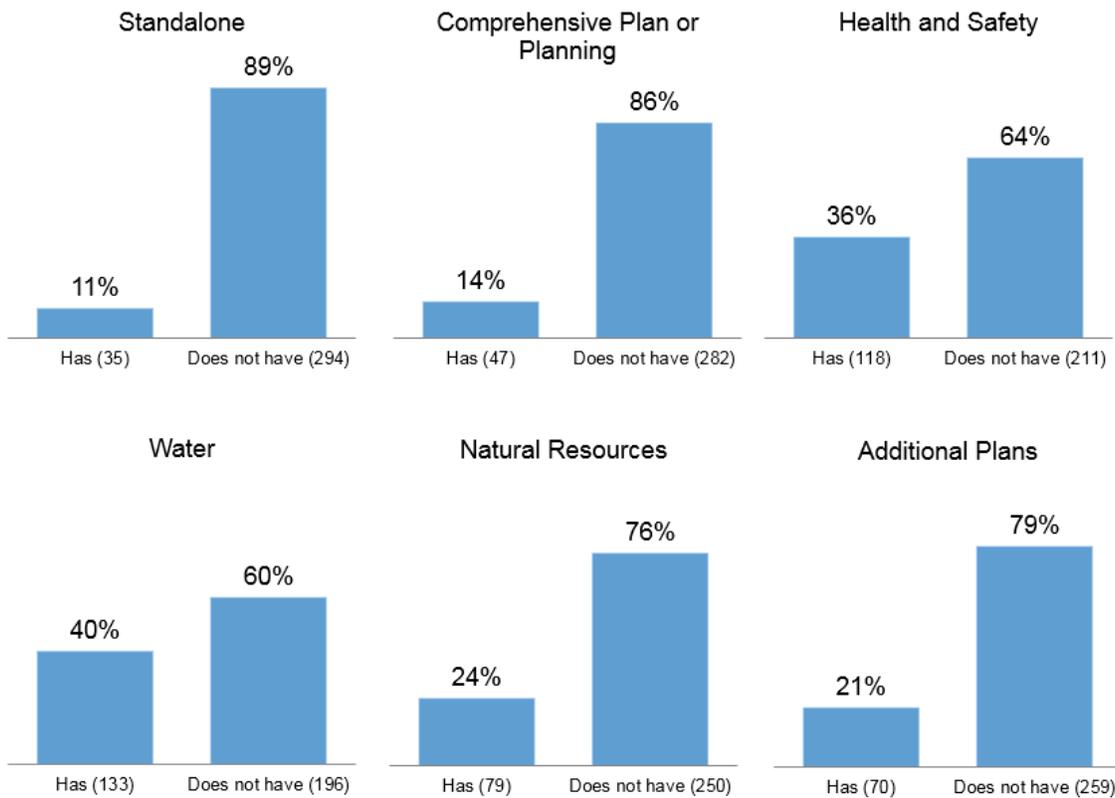
Respondents' planning efforts

Responding governmental organizations are engaged in a wide range of planning efforts. The majority of responding organizations have plans or are engaged in planning efforts that specifically address climate adaptation and resilience in some way. Most are taking a limited approach, however, with relatively few engaged in many different types of plans or planning efforts related to climate adaptation and resilience.

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

- About 40% of responding organizations are engaged in water plans or planning efforts with climate adaptation and resilience content.
- Over one-third of responding organizations indicated that they are engaged in health and safety planning efforts that include content on climate adaptation and resilience.
- Almost one-fourth of responding organizations indicated that they have natural resources plans or planning efforts with climate adaptation and resilience content.
- Less than one-fourth of responding organizations indicated that they are engaged in some other type of planning effort that includes climate adaptation and resilience.
- Relatively few responding organizations are engaged in standalone climate adaptation planning efforts or in comprehensive planning efforts that include climate adaptation or resilience content.

Figure 2. Climate adaptation or resilience content in planning efforts by type of plan¹



Resources and assistance needed

Responding organizations provided input about the types of resources or assistance that would be helpful to their organization for climate adaptation and resilience planning. Close to two-thirds of respondents identified best practices for climate adaptation and resilience as a helpful resource. Over half of respondents selected planning toolkit and guides, financial assistance, model climate adaptation and resilience plans, and model policies or ordinances as resources that would help their organizations.

Over 40% of respondents provided their contact information in response to a question regarding whether they are interested in receiving assistance on climate adaptation or resilience. This suggests that the organizations responding to this survey are generally interested in learning more (and potentially doing more) about climate adaptation and resilience planning.

Experience with events or trends associated with the changing climate

Almost three-fourths of responding organizations indicated that their organization or community experienced extreme rainfall events in the past decade. Milder winters (51%) and increased problems with invasive species (40%) were the next most frequently identified trends or events. Organizations

¹ These percentages are based on survey responses. See page 18 for additional information.

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

Recommendations for future surveys

MAD's role in this project was survey development, administration, and analysis, with the expectation that ICAT 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.

Survey timing: MAD recommends that ICAT conduct the survey on a roughly 2-3 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.

Potential additional or expanded questions: MAD recommends that the group consider adding or refining questions or topics to address certain issues (such as expansion of planning efforts or additional resource needs). Detailed recommendations are on page 24.

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

Background and Methods

The Minnesota Pollution Control Agency (MPCA) is a member of the Minnesota Interagency Climate Adaptation Team (ICAT). In 2015, ICAT developed a set of five statewide indicators to help track progress towards achieving “a resilient, economically thriving, and healthy Minnesota that is prepared for both short- and long-term climate changes and weather extremes.”²

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

MAD worked with a team of experts from MPCA (see team list on inside cover) to design the survey and conduct analyses that would be useful to ICAT. A detailed description of survey methods is in Appendix B, and the full survey is in Appendix C.

The primary purposes of the survey were:

- Develop an estimate of the extent of government agencies’ planning efforts that could serve as ICAT’s indicator
- Learn more about the types of climate adaptation and resilience planning efforts by governmental organizations
- Gain information about what types of resources might be useful to governmental organizations engaged in climate adaptation and resilience planning

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

The survey was not intended to identify implementation challenges, provide information on content of plans within individual organizations, or solicit opinions about climate change in general.

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

Respondents

Overall, 329 organizations responded to the survey, representing 30% of all survey recipients. Table 1 below shows the response rates by type of organization and the proportion of all survey responses represented by each group. Cities, the largest group of survey recipients, had a 25% response rate.

² ICAT, “Using Results-Based Accountability (RBA) to develop statewide indicators,” Appendix A.

County organizations had a 31% response rate and make up a much smaller subset of the survey results. Other organization types had even higher response rates.

Table 1. Responses by organization type

Organization type	Number	Response rate	Percentage of survey responses
City	204	25%	62%
Soil and water conservation district	42	47%	13%
Watershed district	32	51%	10%
County	27	31%	8%
State agency	19	63%	6%
Tribal Government	5	45%	2%
Overall	329	30%	-

Table 3 shows the distribution of responses by size of organization based on number of employees. Most survey respondents are relatively small organizations. Since survey distribution lists did not include number of employees, it was not feasible to calculate response rates by size.

Table 2. Responses by size of organization (employees)

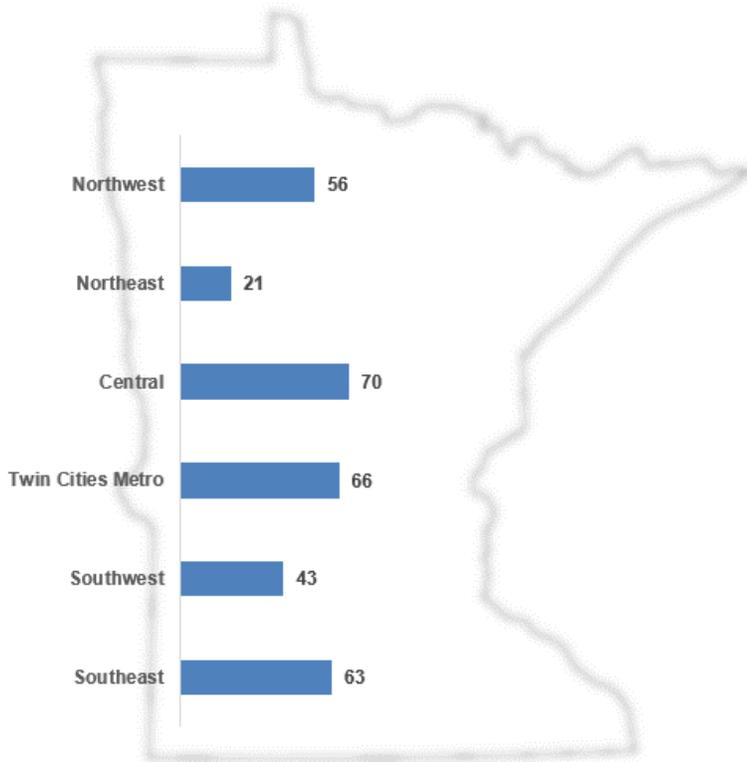
Number of employees	Number	Percentage of survey responses
0-10	182	55%
11-50	57	17%
51-200	37	11%
201-500	17	5%
501-1000	6	2%
Over 1000	11	3%
Did not respond	19	6%
Total	329	-

Table 2 and Figure 3 show the distribution of responses by region, indicating that the survey reached a range of organizations across the state (respondents could select more than one region). Since survey distribution lists did not indicate region of the state, and since some organizations may cross regional boundaries, it was not feasible to calculate response rates by region.

Table 3. Responses by region

Region	Number	Percentage of Survey Responses
Northwest	56	18%
Northeast	21	7%
Central	70	22%
Twin Cities Metropolitan Area	66	21%
Southwest	63	20%
Southeast	43	14%
Organizations with statewide coverage	16	16%
Did not respond to this question	13	4%
Total	329	--

Figure 3. Responses by region^{3,4}



³ Appendix D contains a chart showing the *types of organizations* represented in the survey data by region.

⁴ Respondents were not required to answer questions about region or type of organization, so the data here is not reflective of the entire survey dataset. Results are not shown for organizations that selected “Minnesota statewide” unless they also selected a region.

Statewide Indicator of Climate Adaptation and Resilience Planning

A primary purpose of this survey was to develop a statewide indicator of government planning efforts related to climate adaptation and resilience. One option for developing this indicator would be to look solely at survey responses—the proportion of respondents that selected planning options, for example. The survey results should be put in context, however: the 30% response rate was good for a survey of this kind, but the organizations responding to the survey may not be reflective of all governmental organizations in Minnesota, so survey results alone would not be a realistic indicator of statewide planning efforts.⁵

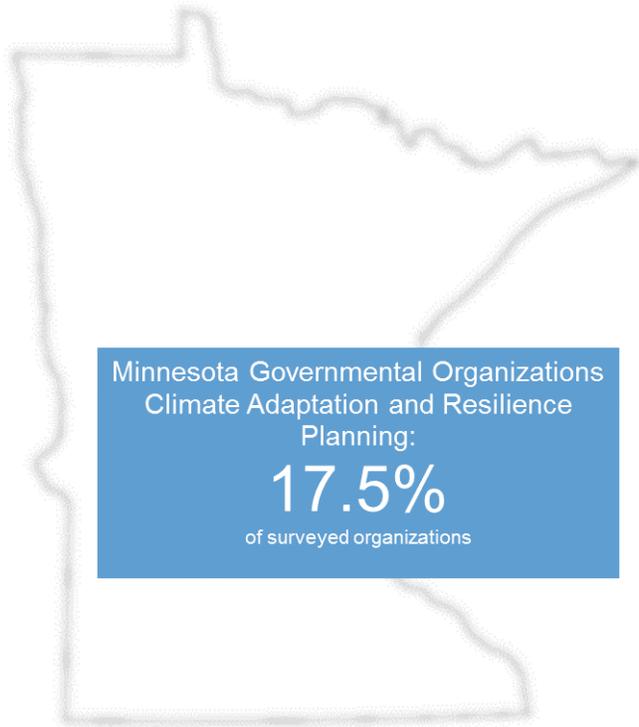
A reasonable (and likely conservative) estimate of statewide planning efforts can be calculated by examining survey data in the context of all surveyed organizations: MAD took the total number of responding organizations that indicated they are engaged in any type of planning efforts with content specifically related to climate adaptation or resilience (189) and divided that by the total number of survey recipients (1079).⁶ Using this calculation, 17.5% of surveyed organizations report that they have at least one plan or planning effort with content that specifically addresses climate adaptation and resilience.

The data described above can serve as an indicator for evaluating progress in ICAT's ongoing work to advance climate adaptation in Minnesota. Since specifically increasing standalone planning efforts is not among the overall objectives of ICAT's work, attention to a separate indicator on standalone planning would not be useful at this time, though a similar methodology could be used (dividing the total number of survey respondents that engage in standalone planning by the total number of survey recipients).

⁵ Organizations that chose to complete the survey may be more interested or engaged in climate adaptation and resilience planning than organizations in general, which could drive up the number of affirmative responses to survey questions. Conversely, since the survey was typically sent to a generic contact in city or county government, it is possible that the recipient was unfamiliar with existing planning efforts (perhaps not replying at all or not replying fully), which could mean the number of affirmative responses in the survey is not reflective of actual planning efforts. The relatively large proportion of respondents from soil and water conservation districts and watershed districts compared to respondents from city governments also suggests a need for caution in generalizing survey results.

⁶ A respondent was designated as being engaged in climate adaptation or resilience planning if they selected any response to questions in the survey about climate adaptation or resilience planning efforts. In a few cases, respondents were designated as being engaged in planning if they did not select a planning option from the listed options but described a specific relevant plan or planning effort in their responses to the survey's open-ended question about other types of planning efforts. MAD relied on MPCA staff for guidance in those instances.

Figure 4. Statewide indicator



Survey Respondents' Planning Efforts

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

The charts in the next sections show the proportion of responses for each detailed type of plan or planning activities. In some charts below, the survey option is truncated—the full questionnaire is in Appendix C.⁷ The sections below are presented in the same order as the questions appeared in the survey.

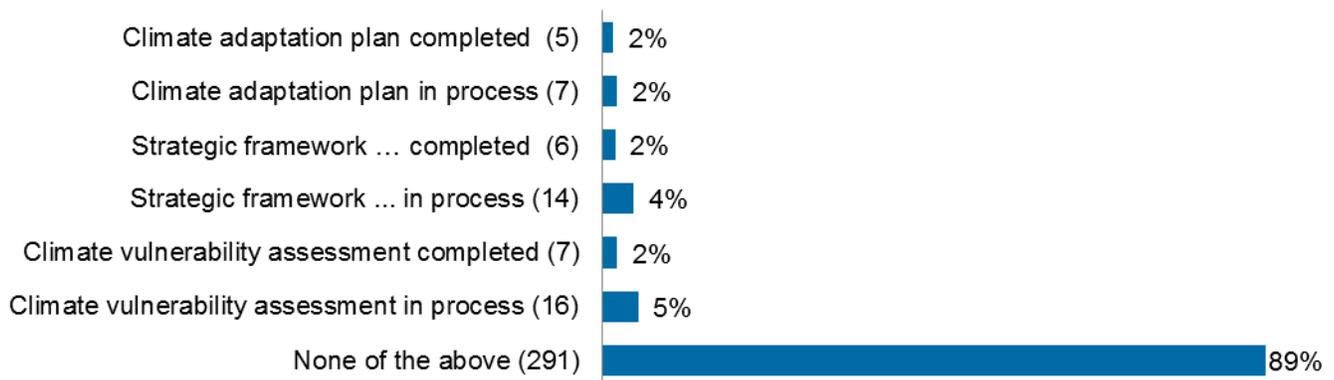
⁷ Totals may equal more than 100% because respondents could select multiple options (excluding “None of the above”).

Standalone planning

Survey question: Has your organization engaged in any of the following standalone planning efforts specifically to address climate adaptation and resilience?

Relatively few responding organizations are engaged in standalone planning efforts. Slightly more respondents indicated that they are engaged in climate vulnerability assessment than strategic framework or climate adaptation planning efforts. More of these efforts are in process than are completed.

Figure 5. Standalone planning

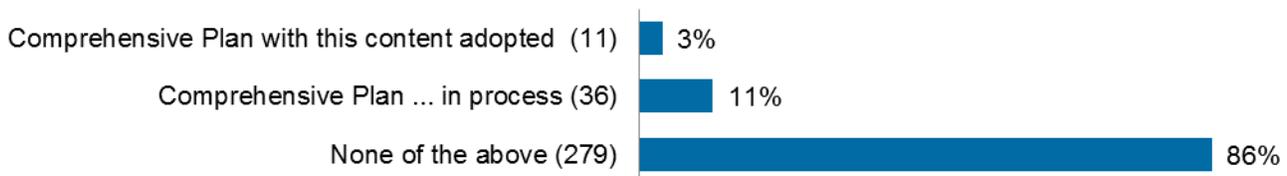


Comprehensive planning

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

Relatively few responding organizations have a comprehensive plan in place or in process that includes climate adaptation or resilience content.

Figure 6. Comprehensive plan

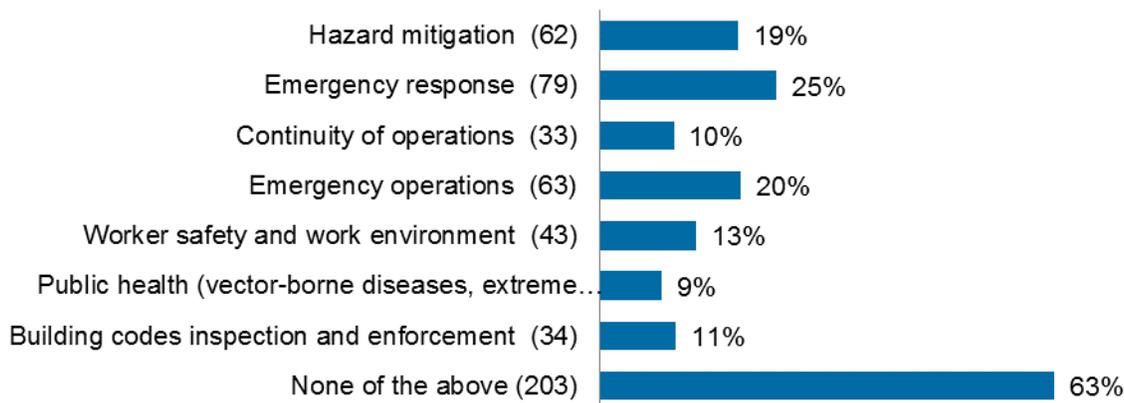


Health and safety planning

Survey question: Does your organization have any health and safety plans or planning efforts with content that specifically addresses climate adaptation and resilience?

Over one-third of responding organizations⁸ indicated that they are engaged in health and safety planning efforts that include content on climate adaptation and resilience: emergency response (25%), emergency operations (20%), and hazard mitigation (19%) were the most frequently cited types of planning.

Figure 7. Health and safety planning



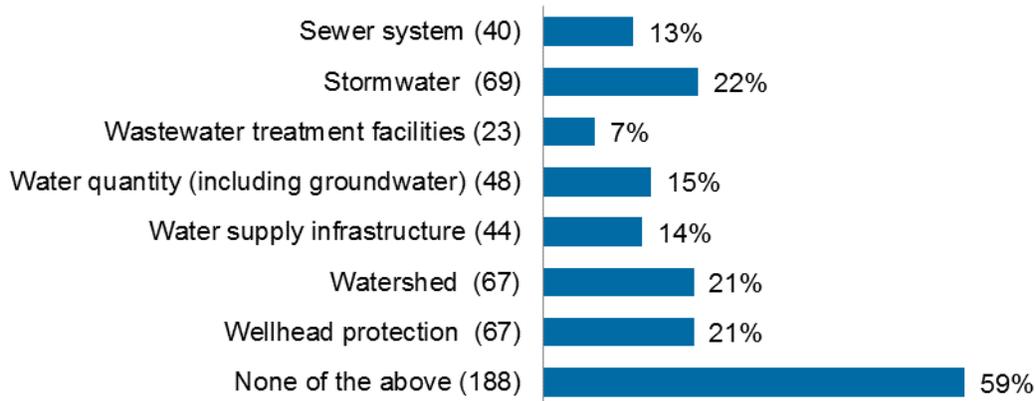
Water planning

Survey question: Does your organization have any water plans or planning efforts with content that specifically addresses climate adaptation and resilience?

About 40% of responding organizations are engaged in water plans or planning efforts with climate adaptation and resilience content: stormwater (22%), watershed (21%), and wellhead protection (21%) were the most commonly reported efforts.

⁸ For specific calculations on overall responses in each type of planning effort, go to the next section of this report, *A broader view of planning efforts among survey respondents*, beginning on page 18.

Figure 8. Water planning

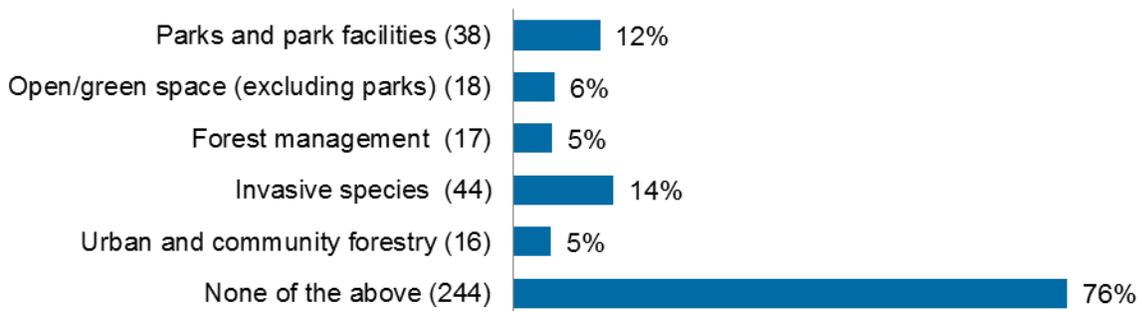


Natural resources planning

Survey question: Does your organization have any natural resources plans or planning efforts with content that specifically addresses climate adaptation and resilience?

Almost one-fourth of responding organizations indicated that they have natural resources plans or planning efforts, with invasive species planning (14%) and parks and facilities planning (12%) most often cited.

Figure 9. Natural resources planning

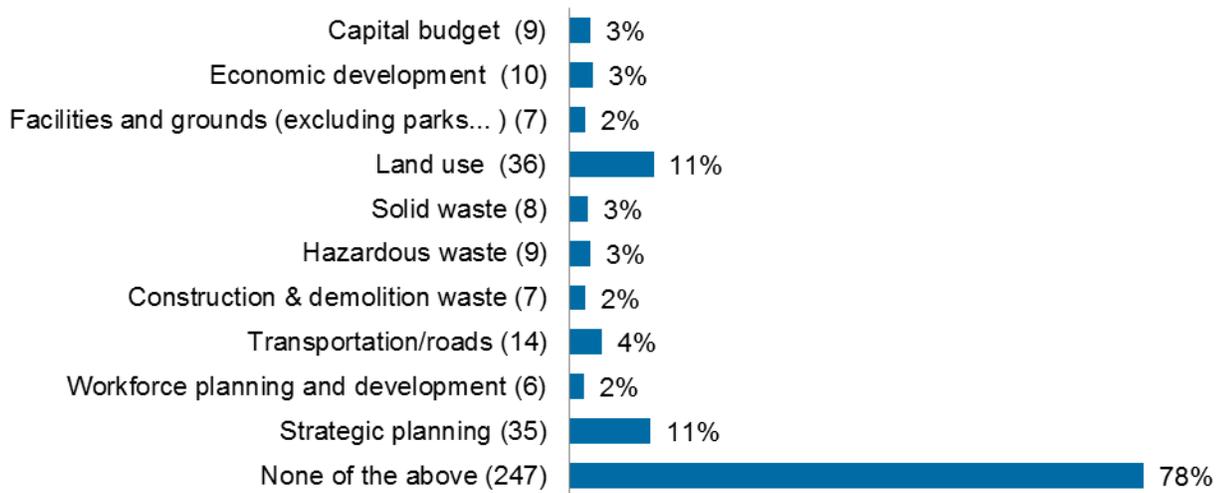


Additional planning efforts

Survey question: Has your organization engaged in any additional planning efforts with content that specifically addresses climate adaptation and resilience?

Less than one-fourth of responding organizations indicated that they are engaged in some other type of planning effort that includes climate adaptation and resilience. Strategic planning and land use planning (both 11% of responding organizations) were the most often selected.

Figure 10. Additional planning



Other types of planning

Survey question: Has your organization engaged in any other planning with content specifically related to climate adaptation and resilience?

About 15% of survey respondents offered some comments (excluding responses like “none” or “not applicable”).⁹ Over half of the commenters appeared to be explaining why the organization had not taken additional action, or to be offering additional detail about their planning efforts. Others (about one-third of those who wrote comments) wrote about efforts that may suggest the need for additional options or clarification in future surveys. These included¹⁰:

- One Watershed, One Plan
- Cover crop or perennial promotion
- Drainage management activities and plans
- Erosion control or landscape plans
- Modeling for infrastructure planning
- Public engagement or organization collaboration activities
- Sustainability management plans
- Energy or renewable energy plans and promotion

⁹ A few respondents used the open comment box to include comments disagreeing with the notion of climate change or with the premises of the survey.

¹⁰ With the exception of One Watershed, One Plan and cover crop or perennial promotion, which were mentioned by a few respondents each, the efforts listed here were mentioned by only one or two respondents.

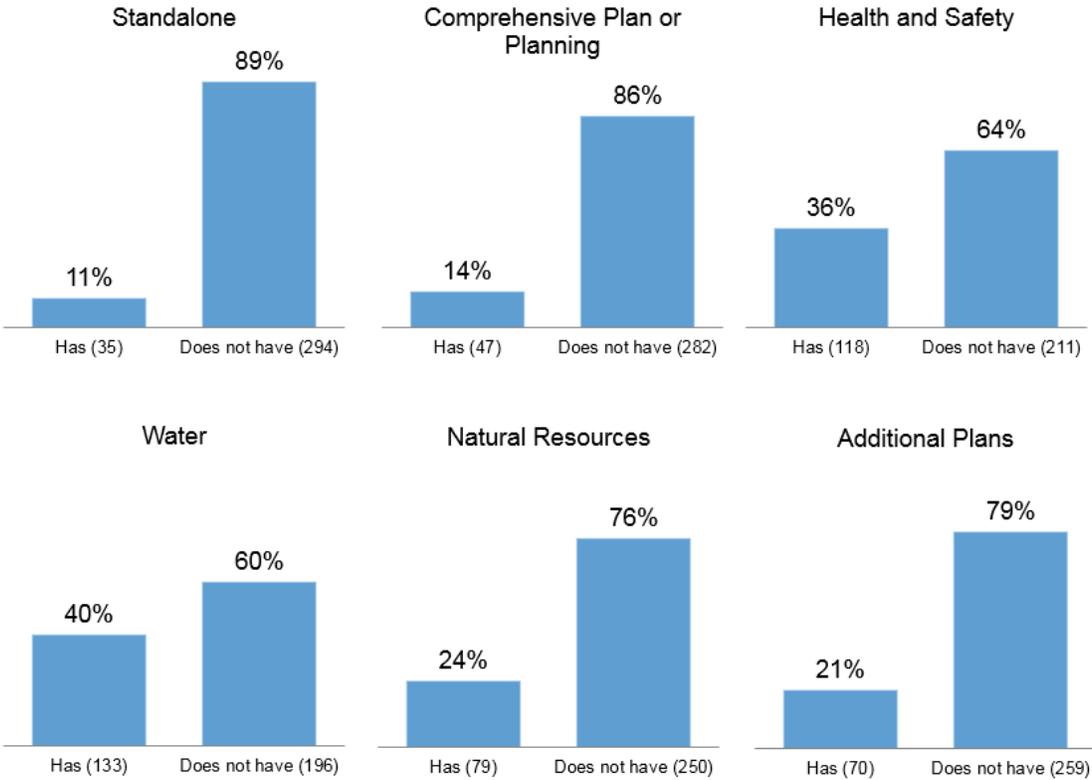
A broader view of planning efforts among survey respondents

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 11 below provides an overview of planning efforts by type of plan:

- About 40% of responding organizations are engaged in water plans or planning efforts with climate adaptation and resilience content.
- Over one-third of responding organizations indicated that they are engaged in health and safety planning efforts that include content on climate adaptation and resilience.
- Almost one-fourth of responding organizations indicated that they have natural resources plans or planning efforts that include content on climate adaptation and resilience.
- Less than one-fourth of responding organizations indicated that they are engaged in some other type of planning effort that includes climate adaptation and resilience.
- Relatively few responding organizations are engaged in standalone climate adaptation planning efforts or in comprehensive planning efforts that include climate adaptation or resilience content.

Figure 11. Climate adaptation or resilience content in planning efforts by type of plan¹¹



¹¹ The values in the columns in these charts are calculated by designating a respondent as “has” for a type of plan if they selected any option under the broad question about that type of plan. Other survey respondents were

Extent of planning efforts

Two other data points provide useful insights from the survey regarding planning efforts: the proportion of responding organizations that are engaged in any type of planning effort (Table 4) and the average number of planning activities for individual organizations (Table 5).¹² Taken together, these responses suggest a wide range of planning efforts among surveyed organizations: The majority of responding organizations have plans or are engaged in planning efforts that specifically address climate adaptation and resilience. Most are taking a limited approach, however, with relatively few engaged in many different types of plans or planning efforts related to climate adaptation and resilience.

Table 4: Respondents that selected any specific planning option

	Number	Percentage of respondents
Respondents engaged in any relevant type of planning	189	57%

Table 5. Planning activities for individual organizations¹³

	Minimum	Maximum	Average
Number of planning options selected per respondent	0	25	3.3

Other Survey Results

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 most frequently selected option was best practices for climate adaptation and resilience—close to two-thirds of respondents (64%) identified that as a potentially helpful resource. Over half of respondents selected planning toolkit and guides (56%), financial assistance (55%), model climate

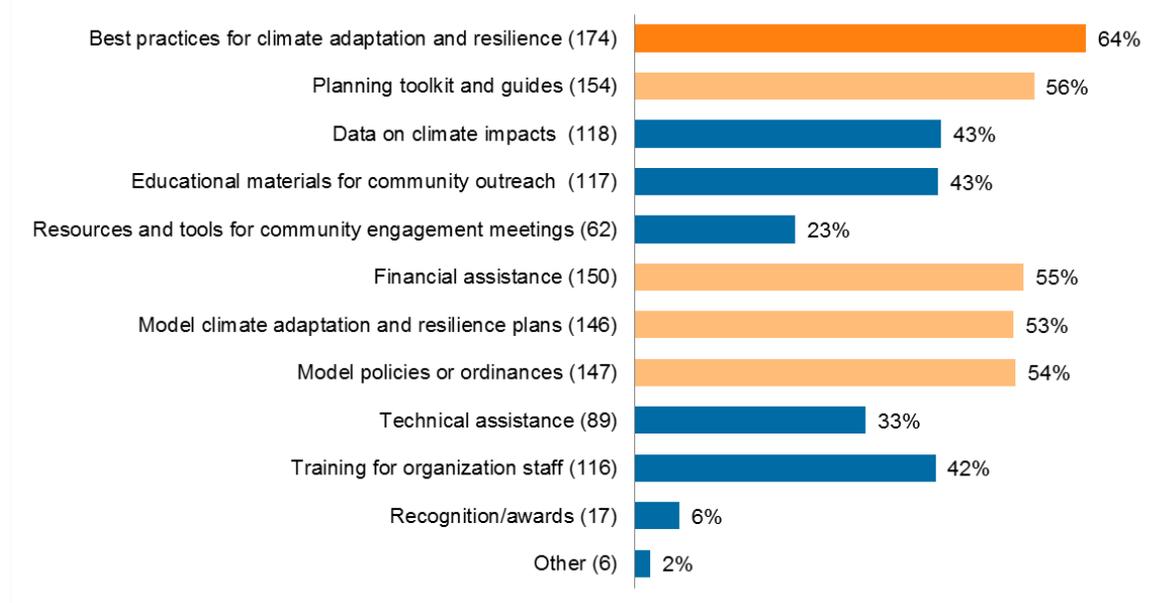
designated as “does not have.” To review the detailed survey questions for each type of plan, see the preceding section or Appendix C. The totals of “Does not have” in a particular type of plan may be different than “None of the above” in the detailed survey responses in the previous section—the “None of the above” responses were selected by respondents, while the data here are calculations.

¹² To calculate the values in this section, MAD used survey responses to each detailed question on planning efforts. For the calculation in Table 4, a respondent who answered affirmatively to any planning option was designated as being engaged in relevant planning. (Respondents were counted once, regardless of whether they selected one, two, or many of the specific planning efforts listed). For calculation in Table 5, MAD took a count of all the planning options selected by each respondent and then derived the average for the survey overall.

¹³ Respondents could select from 37 specific options

adaptation and resilience plans (53%), and model policies or ordinances (54%).¹⁴ The most commonly identified resources are shown in dark orange and light orange in Figure 12 below.

Figure 12. Resources and assistance identified



Of the relatively few respondents that selected “other,” only one offered a suggestion for helpful resources or assistance: dynamic downscaled climate models.¹⁵

Openness to assistance

Over 40% of respondents (144) provided their contact information in response to a question regarding whether they are interested in receiving assistance on climate adaptation or resilience. This suggests that the organizations responding to this survey are generally interested in learning more—and potentially doing more—about climate adaptation and resilience planning.

¹⁴ The questions in this survey were not designed to explore potential resource needs in depth. It may be possible to learn more about needs in this area by contacting those survey respondents who expressed interest in additional information.

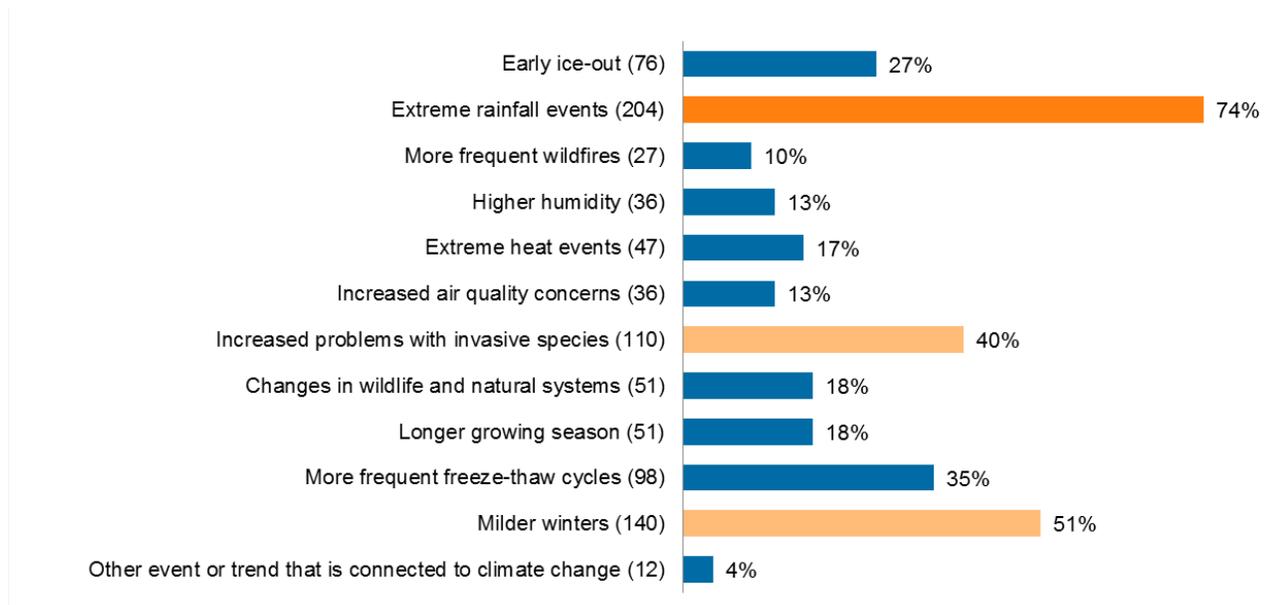
¹⁵ Other responses in this open comment box included “none” or “n/a,” a comment indicating that climate adaptation is not a priority for their organization given other priorities, and a comment regarding “expensive and time wasting regulations.”

Experience with events or trends associated with the changing climate

In an opening question to help set the context for the survey, respondents were asked to select from a list of events or trends associated with the changing climate that have affected their organization or community in the past decade (respondents could skip the question). The list was not intended to be exhaustive, and this question was designed to frame the issue for survey respondents and gather general ideas and impressions from respondents to potentially better understand organizational planning regarding climate adaptation and resilience.¹⁶

By far, respondents selected extreme rainfall events most frequently: 74% of respondents selected this option. Milder winters (51%) and increased problems with invasive species (40%) were the next most frequently identified trends or events. The most commonly identified events and trends are shown in orange and light orange in Figure 13 below. Organizations that experienced one or more climate-related events or trends far more frequently identified plans or planning activities than those organizations that did not (see Appendix H).

Figure 13. Experienced events and trends associated with climate change



Among the 4% of respondents that identified “other” events or trends, responses to a follow-up open-ended question included descriptions of experiences with large storm events or high winds, precipitation amounts exceeding normal averages, a slow trend of drying, lakes freezing later in fall, more ice and snow storms in later spring, and loss of a culturally important species of fish.

¹⁶ The question was also intended to help generally educate the respondents about types of impacts that are often associated with climate change in Minnesota.

Other comments from survey respondents

At the end of the survey, respondents were offered the opportunity to provide any additional thoughts, ideas, questions, or comments. About 10% of survey respondents provided some response to this question (excluding comments like “none”). A few were complimentary of the survey itself, while a few others took issue with the survey or the topic, or emphasized that climate adaptation should not be a priority. Others offered suggestions for survey questions, specific advice for climate adaptation, or provided more detail on their earlier responses.

Two categories emerged from review of the comments: concerns or ideas specifically from small cities and thoughts and suggestions related to assistance.

Several survey respondents noted that they are small cities. Comments in this category:

- *[E]xtremely small community... [This is] sort of unnecessary*
- *Very small city, does not do much to improve...*
- *We are a small town and I'm not sure there is really anything we could do or plan for. What are the impacts to small town?*
- *We are a very small city... We do not have and [sic] planning regarding climate adaptation.*
- *I think most of us small towns would need just the basics to get started, having been through a flood ..., we adapted quite well on our emergency standing!*

Several other respondents offered ideas for assistance that would be helpful or expressed concerns about lack of assistance. Comments in this category:

- *Funding for this work, as well as technical assistance for staff on how to "sell" adaptation work to elected officials (the cost-benefit-risk story) will be critical for this work to move forward.*
- *I am concerned that this will become another responsibility ... with no financial assistance for us to implement!*
- *Planning assistance would be helpful. Perhaps a session [at a conference] on how we can begin this process or incorporate it into our ... plans?*
- *Resources, particularly financial and technical resources, will be essential for planning and mitigating these challenges.*
- *Thank you for the opportunity to provide input! We are interested in including climate adaptation and resilience in our planning but have not had full city council support. Any help for our staff is appreciated!*
- *We are just getting started, so we look forward to your assistance.*

Key Survey Findings and Recommendations for Future Surveys

Key survey findings

This is the first Minnesota statewide survey of climate adaptation and resilience planning. Over 1,000 Minnesota cities, counties, tribal governments, watershed districts, soil and water conservation districts, and key state agencies received the survey, with about 30% responding. Though the responding organizations may not be completely reflective of the state as a whole, the data from the survey can provide useful information to ICAT.

Statewide indicator

A realistic indicator of statewide planning efforts can be calculated using survey data: 17.5% of surveyed organizations (a better indicator than responding organizations) report that they have at least one type of plan or planning effort with content that specifically addresses climate adaptation and resilience.

Respondents' planning efforts

Responding governmental organizations are engaged in a wide range of planning efforts. The majority of responding organizations have plans or are engaged in planning efforts that specifically address climate adaptation and resilience in some way. Most are taking a limited approach, however, with relatively few engaged in many different types of plans or planning efforts related to climate adaptation and resilience.

Specific survey results regarding planning include:

- Within each question about broad types of planning (standalone, health and safety, natural resources, etc.), the most common response was “none of the above.”
- About 40% of responding organizations are engaged in water plans or planning efforts with climate adaptation and resilience content.
- Over one-third of responding organizations indicated that they are engaged in health and safety planning efforts that include content on climate adaptation and resilience.
- Almost one-fourth of responding organizations indicated that they have natural resources plans or planning efforts with climate adaptation and resilience content.
- Less than one-fourth of responding organizations indicated that they are engaged in some other type of planning effort that includes climate adaptation and resilience.
- Relatively few responding organizations are engaged in standalone climate adaptation planning efforts or in comprehensive planning efforts that include climate adaptation or resilience content.

Resources and assistance needed

Responding organizations provided input on the types of resources or assistance that would be helpful to their organization for climate adaptation and resilience planning. Close to two-thirds of respondents identified best practices for climate adaptation and resilience as a helpful resource. Over half of respondents selected planning toolkit and guides, financial assistance, model climate adaptation and resilience plans, and model policies or ordinances as resources that would help their organizations.

Over 40% of respondents provided their contact information in response to a question regarding whether they are interested in receiving assistance on climate adaptation or resilience. This suggests that the organizations responding to this survey are generally interested in learning more (and potentially doing more) about climate adaptation and resilience planning.

Experience with events or trends associated with the changing climate

Almost three-fourths of responding organizations indicated that their organization or community has experienced extreme rainfall events in the past decade. Milder winters (51%) and increased problems with invasive species (40%) were the next most frequently identified trends or events. Organizations that experienced one or more climate-related events or trends far more frequently identified plans or planning activities than those organizations that did not.

Recommendations for future surveys

MAD's role in this project was survey development, administration, and analysis, with the expectation that ICAT 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.

Survey timing: MAD recommends that ICAT conduct the survey on a roughly 2-3 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.

Potential additional or expanded questions: MAD recommends that the group consider adding or refining questions or topics:

- Consider adding questions to gauge how much an organization may have increased (or decreased) their climate adaptation and resilience planning in recent years, and to estimate how long they have been engaged in climate adaptation and resilience planning efforts.
- Review survey responses to the “other” option regarding planning (see section beginning on page 17). These may offer additional options for questions in future surveys (or may suggest the need for clarification of options): options such as cover crop planning or promotion, drainage control plans, and erosion control plans may be helpful.
- As climate adaptation and resilience planning become more common, consider adding a question to further define resource needs, such as providing more detailed descriptions of options or asking respondents to prioritize among options they select.
- As climate adaptation and resilience planning becomes more common, consider asking a question regarding barriers to implementation.

Restraint on survey expansion: Though there are benefits to adding questions and collecting additional information, MAD suggests that ICAT be cautious. Maintaining a brief survey with narrow scope will minimize the burden on respondents, and maintaining the survey’s focus on climate adaptation and resilience planning will make it easier to repeat the survey and have consistent data over time.¹⁷

¹⁷ If the survey is opened for substantial revision or wider scope, there may be a tendency to modify existing questions substantially, or to ask so many follow-up questions that the survey data is not as comparable from one version to the next.

Appendix A. Development of ICAT Indicators

The information below is a handout prepared by ICAT. It is included as context for this survey.

Using Results-Based Accountability to develop statewide indicators

The Minnesota Interagency Climate Adaptation Team (ICAT) developed a set of five statewide indicators in late 2015 using the Results-Based Accountability (RBA) process - <http://resultsaccountability.com/>. Working with Judy Plante of MMB, ICAT members participated in a half-day workshop in September 2015, which was followed up by additional meetings and discussion through which indicators were agreed upon through a consensus-based process. ICAT's goal is to report initial data for each of the selected indicators by August 2016.

The five statewide indicators, summarized below, will help to track statewide progress towards the team's common vision: *ICAT's vision is of a resilient, economically thriving, and healthy Minnesota that is prepared for both short- and long-term climate changes and weather extremes.*

1) Climate adaptation planning by state agencies, local units of government and tribal governments

Purpose of indicator:

- Measure degree to which stand-alone adaptation plans are being prepared by agencies, local units of government and tribes
- Also measure degree to which adaptation is being incorporated into ongoing plans and planning

Data collection strategy: Online survey

Lead agency: MPCA

2) Disruptions to the power grid

Purpose of indicator:

- Proxy measure of preparedness/resilience for extreme weather and other climate impacts

Data collection strategy:

- Utilize existing data sources, i.e., from HSEM, MN Department of Commerce, US Department of Energy

Lead agency: Commerce

3) Hospital data for heat-related health impacts

Purpose of indicator:

- Proxy measure of preparedness/resilience for extreme heat on human health

Data collection strategy:

- Utilize existing data sources from MDH's MN Environmental Public Health Tracking Program (MN EPHT)

Lead agency: MDH

4) Inflation adjusted damages from extreme weather

Purpose of indicator:

- Proxy measure of preparedness/resilience for climate impacts

Data collection strategy:

- Utilize existing data sources from HSEM and FEMA

Lead agency: HSEM

5) **Canopy cover of urban and community forests**

Purpose of indicator:

- Proxy measure of implementation of green infrastructure practices for climate adaptation and degree of vulnerability to climate change

Data collection strategy:

- Utilize existing data sources from DNR

Lead agency: DNR

Appendix B. Methods Detail

Overview

Number of survey recipients: 1079

Survey in the field: May 17, 2016 to June 7, 2016

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

Weighting: The data are not weighted

Data collection: Management Analysis & Development (MAD)

Analysis/report: MAD, with input from MPCA

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

Survey recipients

MPCA obtained email lists of cities and counties from the League of Minnesota Cities and the Association of Minnesota Counties, respectively. The contacts for city governments were typically the city administrator, city clerk, city clerk/treasurer, or some combination of those titles. The contacts for counties were typically the county administrator or coordinator. MPCA obtained lists for soil and water conservation districts, watershed districts, and water management organizations from the Minnesota Board of Water and Soil Resources. In these organizations, the survey typically was sent to the district manager or administrator. MPCA supplied contact information for key state agencies, including ICAT contacts and leaders in large state agencies, and for tribal governments. Tribal government contacts were typically in natural resources, environmental, or planning departments. MPCA sent an introductory email to these individuals to explain the survey, identify any outdated email addresses, and offer to change the contact person for the organization. MPCA updated the original list to reflect changes in contact details.

Survey development

The MPCA and MAD research team developed the survey questions, focusing on questions that would facilitate the development of an overall indicator for climate adaptation and resilience planning and provide information about the extent of planning efforts across the state. Four additional types of questions were included in the survey: a question regarding resources that might help survey respondents in their planning efforts, a question regarding the types of climate-related events or trends they have experienced, a final open question for respondents to provide any additional feedback, and key descriptive questions about the organizations (type of organization, region, and number of employees). The team intentionally did not include questions about barriers to implementation or attitudes regarding climate change.

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

Survey administration and analysis

MAD administered the survey online using Snap Survey Software, which records data as questionnaires are completed. The survey invitation indicated that MAD was conducting the survey for ICAT, and that MAD would maintain private data from survey respondents. (Survey respondents who asked to receive additional information volunteered to share their contact information.)

The survey was open from May 17, 2016 to June 7, 2016 (the survey was reopened for a short period to accommodate an absent respondent who requested additional time to complete the survey).

To increase response rates, MAD's survey software sent five reminder emails to non-respondents during the course of the survey, timed with consideration of the Memorial Day holiday; the final email indicated that the survey deadline was extended. When MAD received information from its system indicating that a message was not delivered to an email address, MAD attempted to obtain a valid address or emailed the recipient directly.

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. In a few instances where a respondent clearly checked an incorrect organization type (a non-tribal organization selecting "Tribal" for example), MAD changed the organization type to match the data from the distribution lists. Since distribution lists did not include size of organization or region information, MAD did not clean this data.

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

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

Response rates and response patterns were reasonable, so ICAT and others can use this information to understand current situations and identify patterns and trends.

Appendix C. Survey

The following text is from the online survey questionnaire. Formatting has been changed.

2016 Climate Adaptation and Resilience Planning Survey

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

This survey has been sent to you as the contact for your organization. Please respond for your organization to the best of your ability. Feel free to ask other people for the answers. If you cannot complete the survey uninterrupted, your responses will be saved automatically and you can return later to complete the survey. All responses will be aggregated in a summary report, and not identified with specific individuals or organizations.

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 our variable and changing climate. Observed and projected climate impacts include: increasing intensity and frequency of heavy rainfall, decline in severity and frequency of extreme cold, more frequent freeze/thaw cycles, and future increased incidence of heat waves and drought.

To begin the survey, click the "Next" button below.

Tips for using this survey:

- You can exit the survey and return later--your responses will be saved automatically.
- To reset your answers on a page, use the "Reset" button. To go back to a previous page, use the "Back" button.
- If you would prefer a text based version of the survey (for example, if you use a screen reader), click on the "text only" link on the center of the top of the screen.

If you have any questions about climate adaptation or resilience, please contact Paul Moss at paul.moss@state.mn.us or 651.757.2586.

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 Beth Bibus at beth.bibus@state.mn.us or 651.259.3820.

The following types of **events and longer-term trends** are associated with the changing climate. In the past decade, have any of these affected your organization or community? Please check all that apply.

- Early ice-out
- Extreme rainfall events
- More frequent wildfires
- Higher humidity
- Extreme heat events
- Increased air quality concerns
- Increased problems with invasive species
- Changes in wildlife and natural systems
- Longer growing season
- More frequent freeze-thaw cycles

- Milder winters
- Other event or trend that is connected to climate change

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

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

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

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

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

Does your organization have a **comprehensive plan** with content that specifically addresses climate adaptation and resilience? Please check all that apply then click *next*:

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

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

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

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

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

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

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

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

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

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

What kind of **resources or assistance** would be most helpful to your organization for climate adaptation and resilience planning? Please check all that apply then click *next*:

- Best practices for climate adaptation and resilience
- Planning toolkit and guides
- Data on climate impacts
- Educational materials for community outreach
- Resources and tools for community engagement meetings
- Financial assistance
- Model climate adaptation and resilience plans
- Model policies or ordinances
- Technical assistance
- Training for organization staff
- Recognition/awards
- Other

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

Please provide information about your organization and geographic area:

Organization type

- City
- County

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

Number of employees in your organization

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

Region (check all that apply)

- Northwest
- Northeast
- Twin Cities metropolitan area
- Central
- Southeast
- Southwest
- Minnesota statewide

Are you interested in receiving assistance on climate adaptation and resilience planning? If so, please provide the following information. This information will be kept separate from your responses to this survey.

Name:

Organization:

Email address:

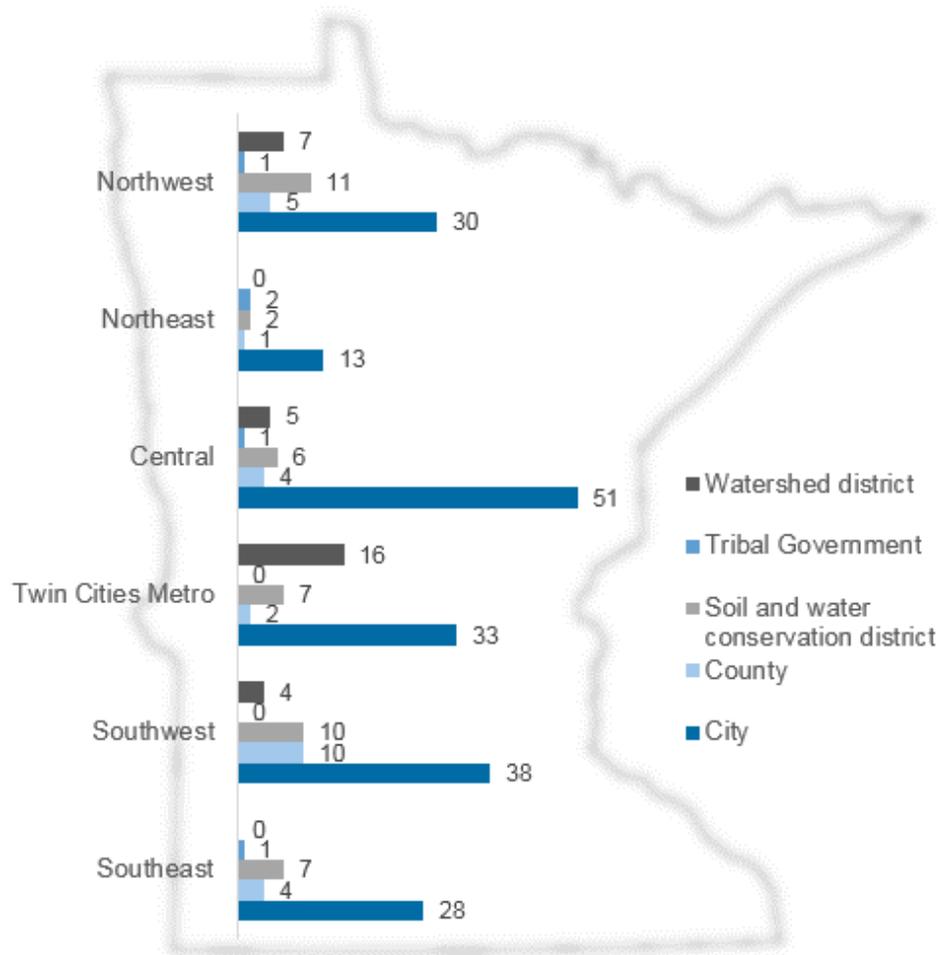
Please share any additional thoughts, ideas, questions and comments below.

Thank you for completing the survey. Please click "Submit"

Appendix D. Survey Respondents by Region and Organization Type

The chart below shows the number of responses within each region by organization type. Responding organizations that left these fields blank or that selected “Minnesota statewide” as their only response are excluded from the chart below. Respondents could select more than one region.

Figure 14. Responses by region and organization type



	City	County	Soil and water conservation district	Tribal Government	Watershed district
Northwest	30	5	11	1	7
Northeast	13	1	2	2	0
Central	51	4	6	1	5
Twin Cities Metro	33	2	7	0	16
Southwest	38	10	10	0	4
Southeast	28	4	7	1	0

Appendix E. Survey Results by Categories

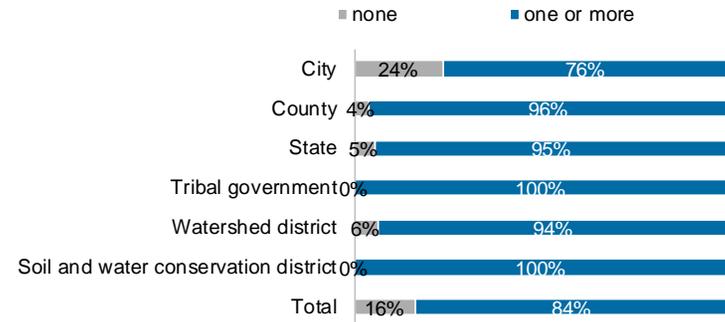
Selected survey results for respondents by organization type, size of organization, and region.

Organization type

Experienced any event or trend connected to climate change

	none	one or more	Total
City	48	156	204
County	1	26	27
State	1	18	19
Tribal government	0	5	5
Watershed district	2	30	32
Soil and water conservation district	0	42	42
Total	53	276	329

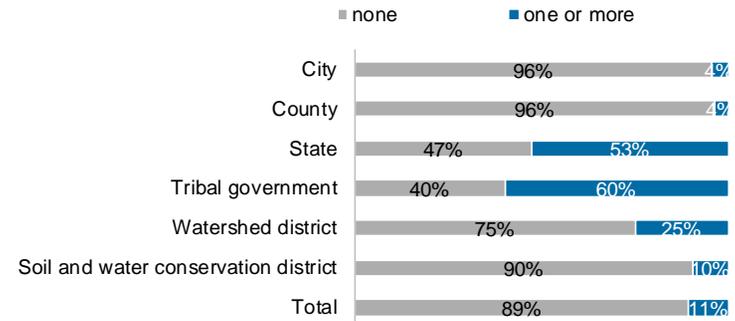
	none	one or more
City	24%	76%
County	4%	96%
State	5%	95%
Tribal government	0%	100%
Watershed district	6%	94%
Soil and water conservation district	0%	100%
Total	16%	84%



Engaged in stand-alone planning activity specifically to address climate adaptation and resilience

	none	one or more	Total
City	195	9	204
County	26	1	27
State	9	10	19
Tribal government	2	3	5
Watershed district	24	8	32
Soil and water conservation district	38	4	42
Total	294	35	329

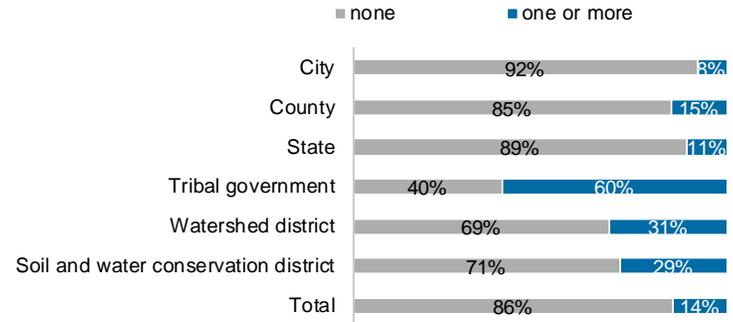
	none	one or more
City	96%	4%
County	96%	4%
State	47%	53%
Tribal government	40%	60%
Watershed district	75%	25%
Soil and water conservation district	90%	10%
Total	89%	11%



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

	none	one or more	Total
City	188	16	204
County	23	4	27
State	17	2	19
Tribal government	2	3	5
Watershed district	22	10	32
Soil and water conservation district	30	12	42
Total	282	47	329

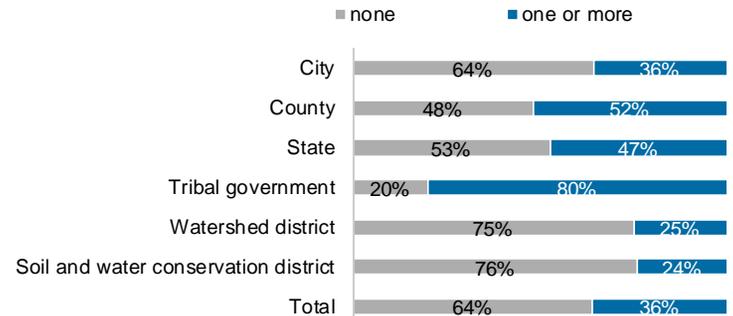
	none	one or more
City	92%	8%
County	85%	15%
State	89%	11%
Tribal government	40%	60%
Watershed district	69%	31%
Soil and water conservation district	71%	29%
Total	86%	14%



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

	none	one or more	Total
City	131	73	204
County	13	14	27
State	10	9	19
Tribal government	1	4	5
Watershed district	24	8	32
Soil and water conservation district	32	10	42
Total	211	118	329

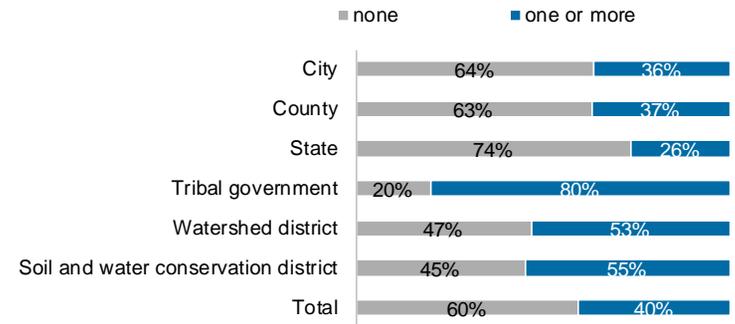
	none	one or more
City	64%	36%
County	48%	52%
State	53%	47%
Tribal government	20%	80%
Watershed district	75%	25%
Soil and water conservation district	76%	24%
Total	64%	36%



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

	none	one or more	Total
City	130	74	204
County	17	10	27
State	14	5	19
Tribal government	1	4	5
Watershed district	15	17	32
Soil and water conservation district	19	23	42
Total	196	133	329

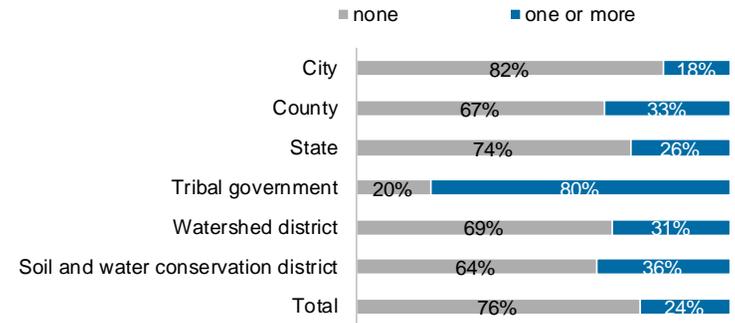
	none	one or more
City	64%	36%
County	63%	37%
State	74%	26%
Tribal government	20%	80%
Watershed district	47%	53%
Soil and water conservation district	45%	55%
Total	60%	40%



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

	none	one or more	Total
City	168	36	204
County	18	9	27
State	14	5	19
Tribal government	1	4	5
Watershed district	22	10	32
Soil and water conservation district	27	15	42
Total	250	79	329

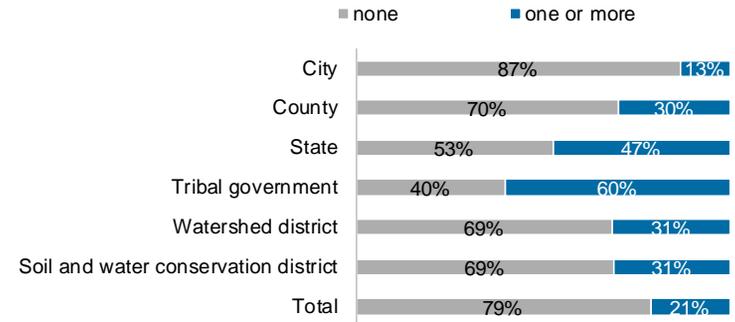
	none	one or more
City	82%	18%
County	67%	33%
State	74%	26%
Tribal government	20%	80%
Watershed district	69%	31%
Soil and water conservation district	64%	36%
Total	76%	24%



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

	none	one or more	Total
City	177	27	204
County	19	8	27
State	10	9	19
Tribal government	2	3	5
Watershed district	22	10	32
Soil and water conservation district	29	13	42
Total	259	70	329

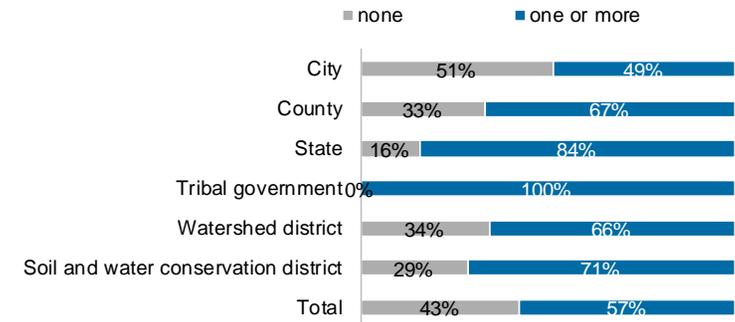
	none	one or more
City	87%	13%
County	70%	30%
State	53%	47%
Tribal government	40%	60%
Watershed district	69%	31%
Soil and water conservation district	69%	31%
Total	79%	21%



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

	none	one or more	Total
City	105	99	204
County	9	18	27
State	3	16	19
Tribal government	0	5	5
Watershed district	11	21	32
Soil and water conservation district	12	30	42
Total	140	189	329

	none	one or more
City	51%	49%
County	33%	67%
State	16%	84%
Tribal government	0%	100%
Watershed district	34%	66%
Soil and water conservation district	29%	71%
Total	43%	57%



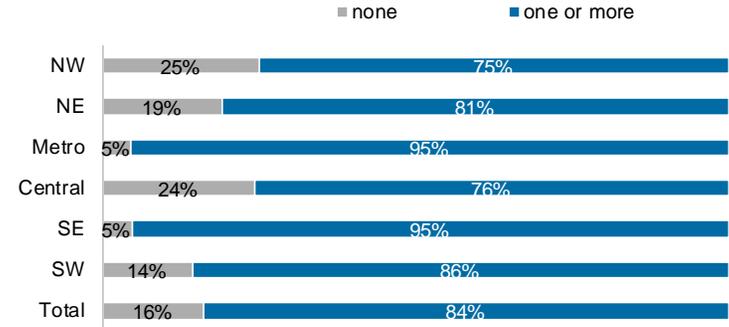
Region

Respondents could select more than one region. Organizations that selected "Minnesota statewide" are included in totals and/or in other regions the respondent may have selected. Total rows represent the full survey data set

Experienced any event or trend connected to climate change

	none	one or more	Total
NW	14	42	56
NE	4	17	21
Metro	3	63	66
Central	17	53	70
SE	2	41	43
SW	9	54	63
Total	53	276	329

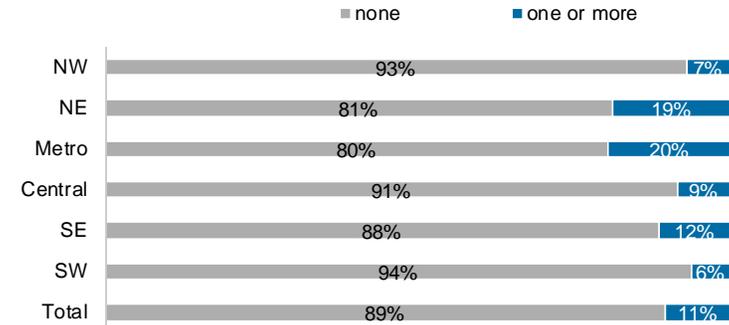
	none	one or more
NW	25%	75%
NE	19%	81%
Metro	5%	95%
Central	24%	76%
SE	5%	95%
SW	14%	86%
Total	16%	84%



Engaged in stand-alone planning activity specifically to address climate adaptation and resilience

	none	one or more	Total
NW	52	4	56
NE	17	4	21
Metro	53	13	66
Central	64	6	70
SE	38	5	43
SW	59	4	63
Total	294	35	329

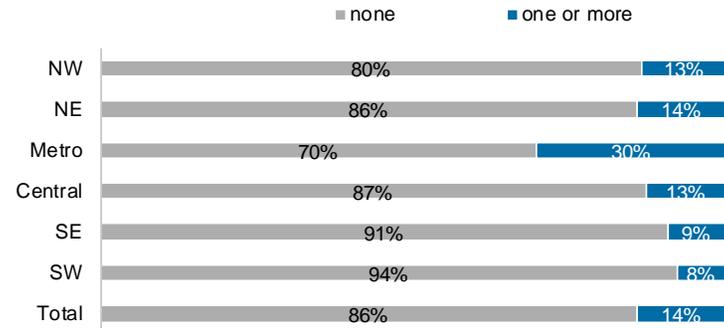
	none	one or more
NW	93%	7%
NE	81%	19%
Metro	80%	20%
Central	91%	9%
SE	88%	12%
SW	94%	6%
Total	89%	11%



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

	none	one or more	Total
NW	45	7	56
NE	18	3	21
Metro	46	20	66
Central	61	9	70
SE	39	4	43
SW	59	5	63
Total	282	47	329

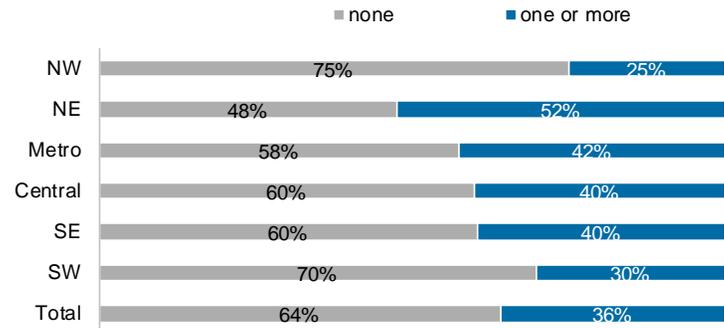
	none	one or more
NW	80%	13%
NE	86%	14%
Metro	70%	30%
Central	87%	13%
SE	91%	9%
SW	94%	8%
Total	86%	14%



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

	none	one or more	Total
NW	42	14	56
NE	10	11	21
Metro	38	28	66
Central	42	28	70
SE	26	17	43
SW	44	19	63
Total	211	118	329

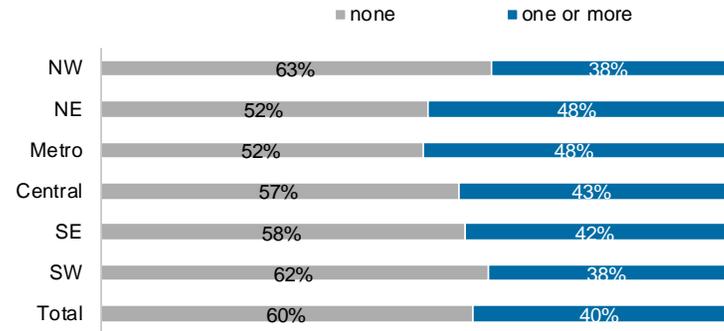
	none	one or more
NW	75%	25%
NE	48%	52%
Metro	58%	42%
Central	60%	40%
SE	60%	40%
SW	70%	30%
Total	64%	36%



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

	none	one or more	Total
NW	35	21	56
NE	11	10	21
Metro	34	32	66
Central	40	30	70
SE	25	18	43
SW	39	24	63
Total	196	133	329

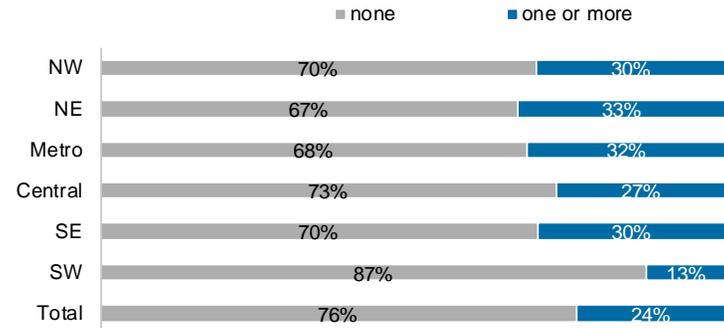
	none	one or more
NW	63%	38%
NE	52%	48%
Metro	52%	48%
Central	57%	43%
SE	58%	42%
SW	62%	38%
Total	60%	40%



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

	none	one or more	Total
NW	39	17	56
NE	14	7	21
Metro	45	21	66
Central	51	19	70
SE	30	13	43
SW	55	8	63
Total	250	79	329

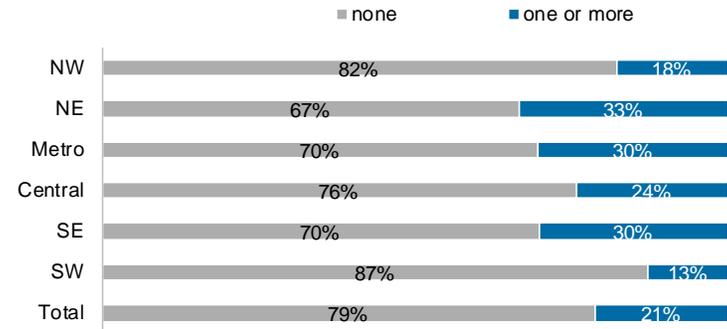
	none	one or more
NW	70%	30%
NE	67%	33%
Metro	68%	32%
Central	73%	27%
SE	70%	30%
SW	87%	13%
Total	76%	24%



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

	none	one or more	Total
NW	46	10	56
NE	14	7	21
Metro	46	20	66
Central	53	17	70
SE	30	13	43
SW	55	8	63
Total	259	70	329

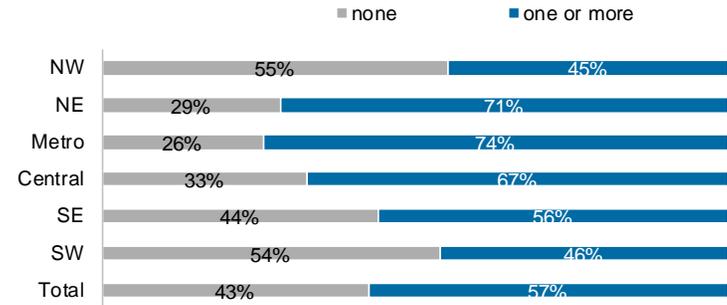
	none	one or more
NW	82%	18%
NE	67%	33%
Metro	70%	30%
Central	76%	24%
SE	70%	30%
SW	87%	13%
Total	79%	21%



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

	none	one or more	Total
NW	31	25	56
NE	6	15	21
Metro	17	49	66
Central	23	47	70
SE	19	24	43
SW	34	29	63
Total	140	189	329

	none	one or more
NW	55%	45%
NE	29%	71%
Metro	26%	74%
Central	33%	67%
SE	44%	56%
SW	54%	46%
Total	43%	57%



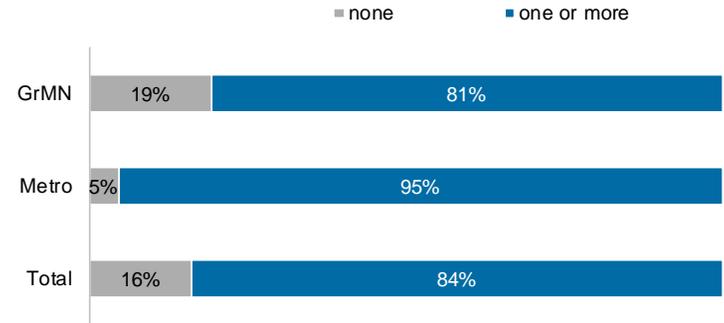
Greater MN/Metro/Statewide

Total rows represent the full survey data set.

Experienced any event or trend connected to climate change

	none	one or more	Total
GrMN	46	194	240
Metro	3	63	66
Total	53	276	329

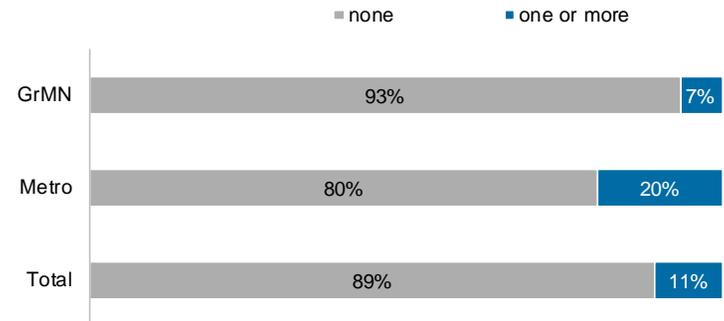
	none	one or more
GrMN	19%	81%
Metro	5%	95%
Total	16%	84%



Engaged in stand-alone planning activity specifically to address climate adaptation and resilience

	none	one or more	Total
GrMN	224	16	240
Metro	53	13	66
Total	294	35	329

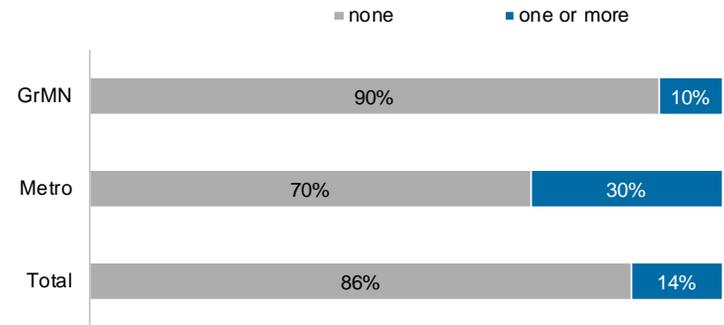
	none	one or more
GrMN	93%	7%
Metro	80%	20%
Total	89%	11%



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

	none	one or more	Total
GrMN	216	24	240
Metro	46	20	66
Total	282	47	329

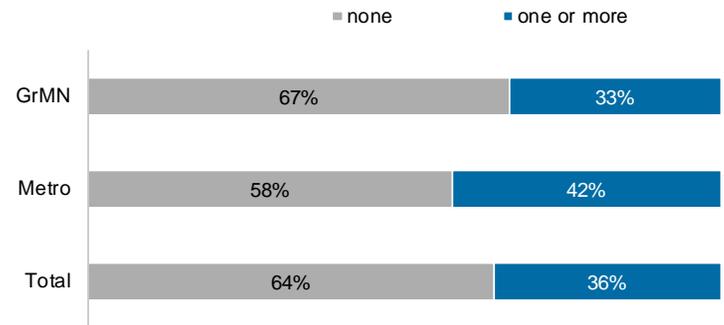
	none	one or more
GrMN	90%	10%
Metro	70%	30%
Total	86%	14%



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

	none	one or more	Total
GrMN	160	80	240
Metro	38	28	66
Total	211	118	329

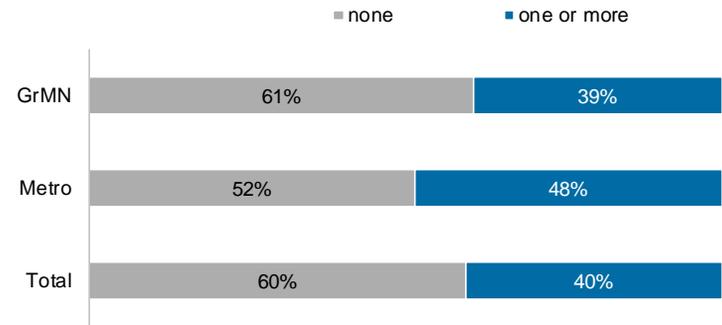
	none	one or more
GrMN	67%	33%
Metro	58%	42%
Total	64%	36%



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

	none	one or more	Total
GrMN	146	94	240
Metro	34	32	66
Total	196	133	329

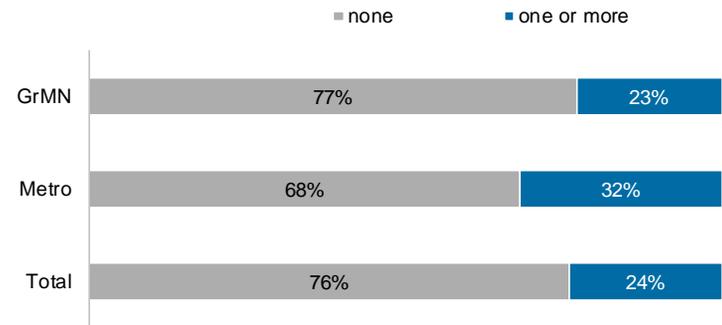
	none	one or more
GrMN	61%	39%
Metro	52%	48%
Total	60%	40%



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

	none	one or more	Total
GrMN	185	55	240
Metro	45	21	66
Total	250	79	329

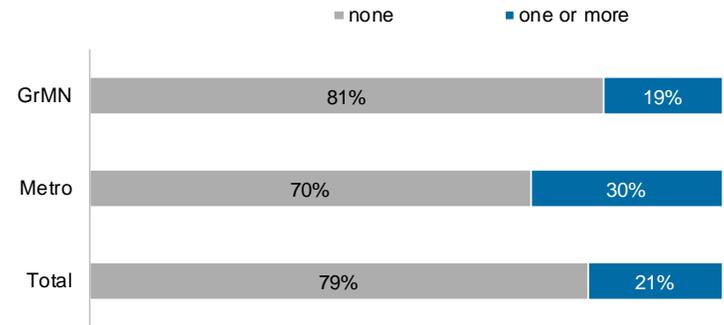
	none	one or more
GrMN	77%	23%
Metro	68%	32%
Total	76%	24%



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

	none	one or more	Total
GrMN	195	45	240
Metro	46	20	66
Total	259	70	329

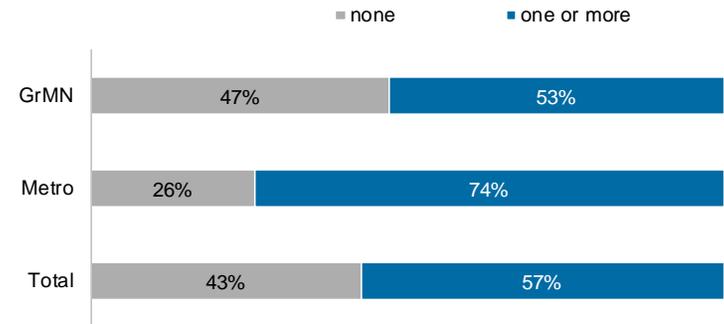
	none	one or more
GrMN	81%	19%
Metro	70%	30%
Total	79%	21%



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

	none	one or more	Total
GrMN	113	127	240
Metro	17	49	66
Total	140	189	329

	none	one or more
GrMN	47%	53%
Metro	26%	74%
Total	43%	57%



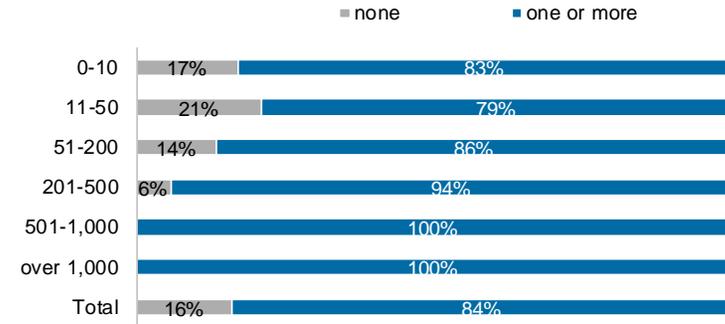
Number of Employees

Total rows represent the full survey data set

Experienced any event or trend connected to climate change

	none	one or more	Total
0-10	31	151	182
11-50	12	45	57
51-200	5	32	37
201-500	1	16	17
501-1,000	0	6	6
over 1,000	0	11	11
Total	53	276	329

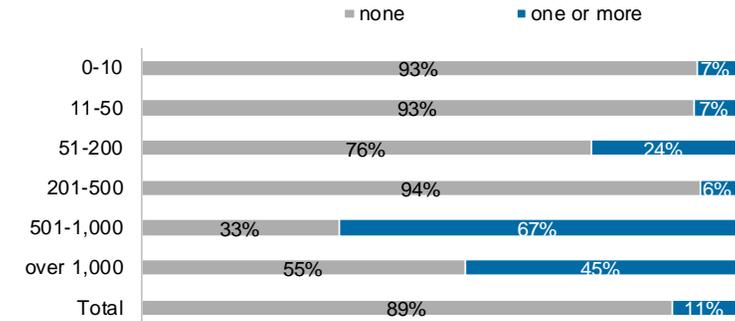
	none	one or more
0-10	17%	83%
11-50	21%	79%
51-200	14%	86%
201-500	6%	94%
501-1,000	0%	100%
over 1,000	0%	100%
Total	16%	84%



Engaged in stand-alone planning activity specifically to address climate adaptation and resilience

	none	one or more	Total
0-10	170	12	182
11-50	53	4	57
51-200	28	9	37
201-500	16	1	17
501-1,000	2	4	6
over 1,000	6	5	11
Total	294	35	329

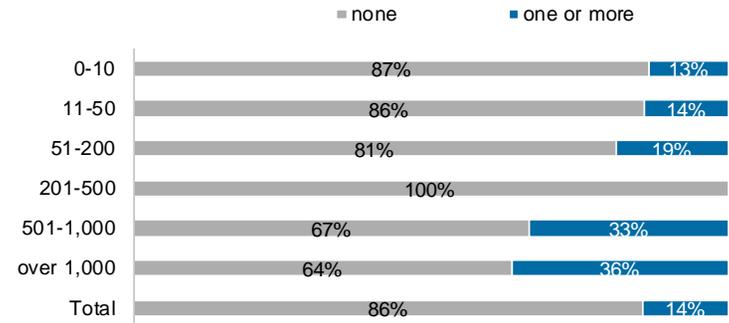
	none	one or more
0-10	93%	7%
11-50	93%	7%
51-200	76%	24%
201-500	94%	6%
501-1,000	33%	67%
over 1,000	55%	45%
Total	89%	11%



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

	none	one or more	Total
0-10	158	24	182
11-50	49	8	57
51-200	30	7	37
201-500	17	0	17
501-1,000	4	2	6
over 1,000	7	4	11
Total	282	47	329

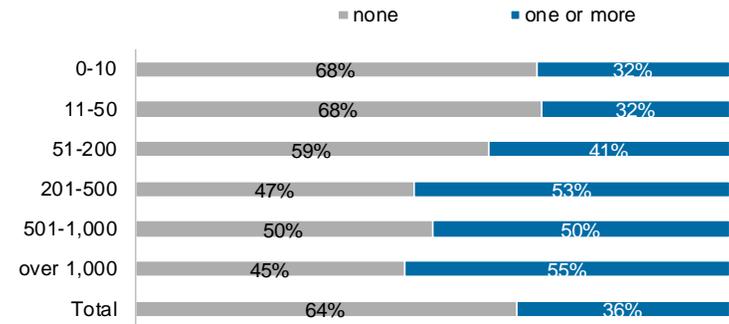
	none	one or more
0-10	87%	13%
11-50	86%	14%
51-200	81%	19%
201-500	100%	0%
501-1,000	67%	33%
over 1,000	64%	36%
Total	86%	14%



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

	none	one or more	Total
0-10	123	59	182
11-50	39	18	57
51-200	22	15	37
201-500	8	9	17
501-1,000	3	3	6
over 1,000	5	6	11
Total	211	118	329

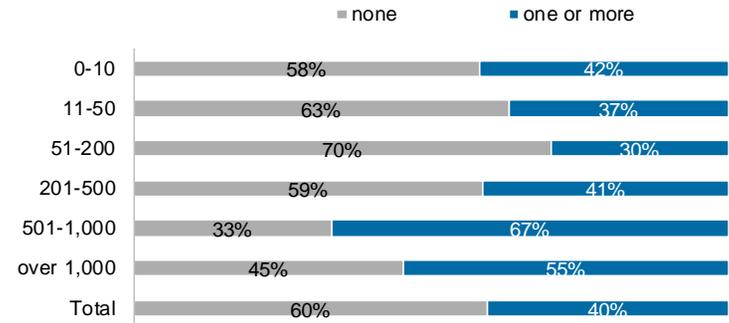
	none	one or more
0-10	68%	32%
11-50	68%	32%
51-200	59%	41%
201-500	47%	53%
501-1,000	50%	50%
over 1,000	45%	55%
Total	64%	36%



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

	none	one or more	Total
0-10	106	76	182
11-50	36	21	57
51-200	26	11	37
201-500	10	7	17
501-1,000	2	4	6
over 1,000	5	6	11
Total	196	133	329

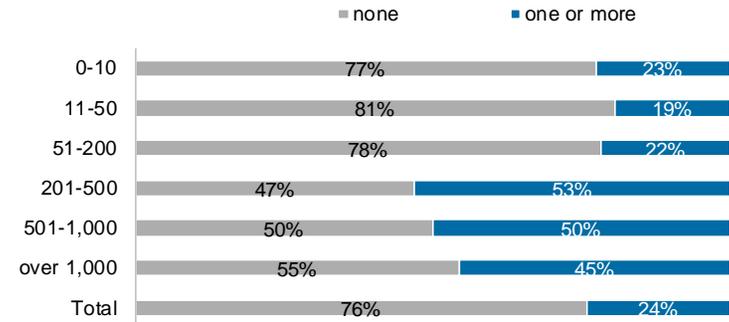
	none	one or more
0-10	58%	42%
11-50	63%	37%
51-200	70%	30%
201-500	59%	41%
501-1,000	33%	67%
over 1,000	45%	55%
Total	60%	40%



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

	none	one or more	Total
0-10	141	41	182
11-50	46	11	57
51-200	29	8	37
201-500	8	9	17
501-1,000	3	3	6
over 1,000	6	5	11
Total	250	79	329

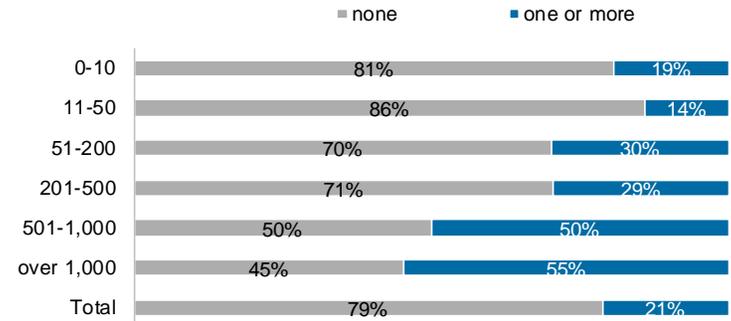
	none	one or more
0-10	77%	23%
11-50	81%	19%
51-200	78%	22%
201-500	47%	53%
501-1,000	50%	50%
over 1,000	55%	45%
Total	76%	24%



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

	none	one or more	Total
0-10	147	35	182
11-50	49	8	57
51-200	26	11	37
201-500	12	5	17
501-1,000	3	3	6
over 1,000	5	6	11
Total	259	70	329

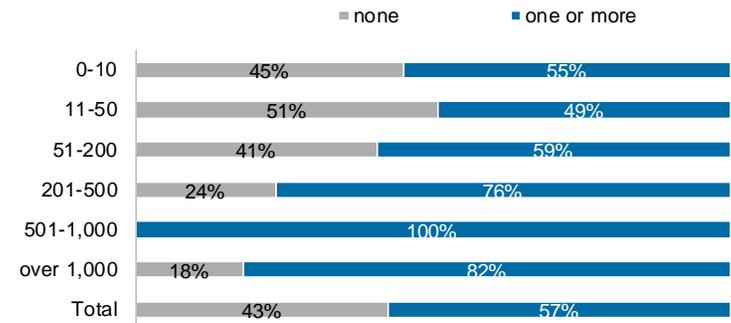
	none	one or more
0-10	81%	19%
11-50	86%	14%
51-200	70%	30%
201-500	71%	29%
501-1,000	50%	50%
over 1,000	45%	55%
Total	79%	21%



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

	none	one or more	Total
0-10	82	100	182
11-50	29	28	57
51-200	15	22	37
201-500	4	13	17
501-1,000	0	6	6
over 1,000	2	9	11
Total	140	189	329

	none	one or more
0-10	45%	55%
11-50	51%	49%
51-200	41%	59%
201-500	24%	76%
501-1,000	0%	100%
over 1,000	18%	82%
Total	43%	57%



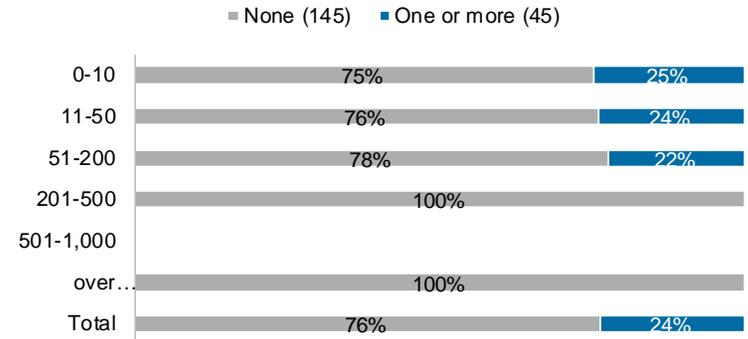
Appendix F. Survey Results: Cities by Size and Region

Cities: Types of Planning Activity by Number of Employees in Organization

190 respondents in data set

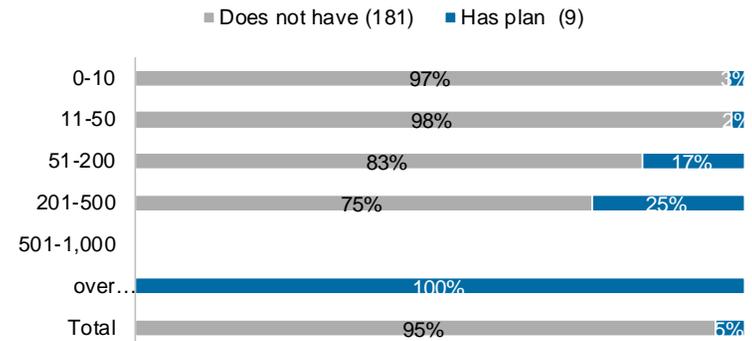
Experienced any event or trend connected to climate change

		Number of employees in your organization						
		0-10	11-50	51-200	201-500	501-1,000	over 1,000	Total
One or more (45)		25%	24%	22%	-	-	-	24%
None (145)		75%	76%	78%	100%	-	100%	76%
Total		117	50	18	4	-	1	190



Engaged in stand-alone planning activity specifically to address climate adaptation and resilience

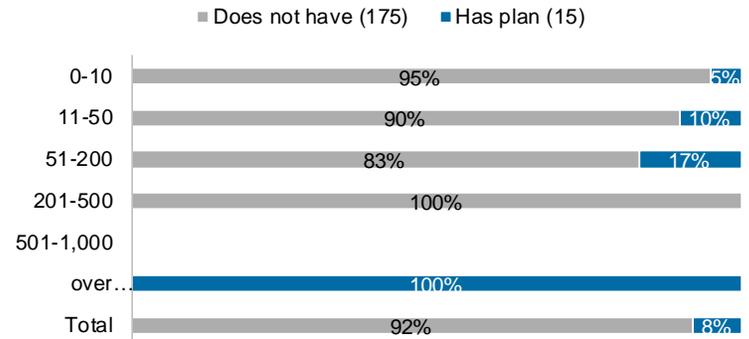
		Number of employees in organization						
		0-10	11-50	51-200	201-500	501-1,000	over 1,000	Total
Has plan (9)		3%	2%	17%	25%	-	100%	5%
Does not have (181)		97%	98%	83%	75%	-	-	95%
Total		117	50	18	4	-	1	190



City results, continued

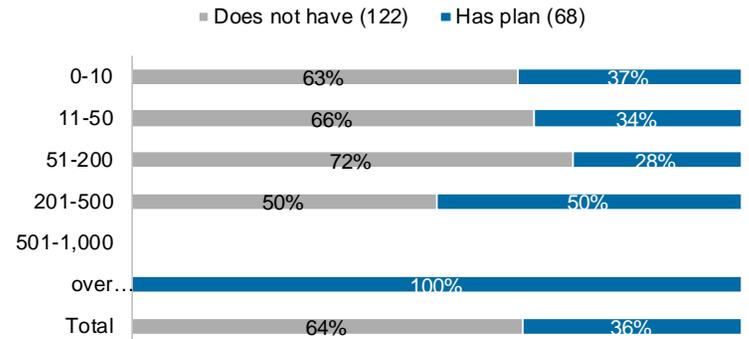
Engaged in comprehensive planning with content specifically addressing climate adaptation and resilience

		Number of employees in organization						
		0-10	11-50	51-200	201-500	501-1,000	over 1,000	Total
Has plan (15)		5%	10%	17%	-	-	100%	8%
Does not have (175)		95%	90%	83%	100%	-	-	92%
Total		117	50	18	4	-	1	190



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

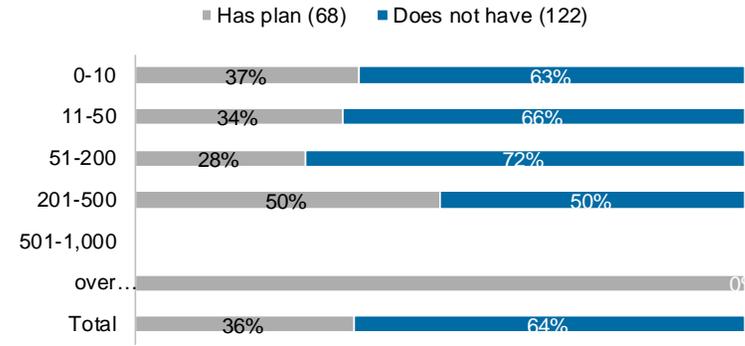
		Number of employees in organization						
		0-10	11-50	51-200	201-500	501-1,000	over 1,000	Total
Has plan (68)		37%	34%	28%	50%	-	100%	36%
Does not have (122)		63%	66%	72%	50%	-	-	64%
Total		117	50	18	4	-	1	190



City results, continued

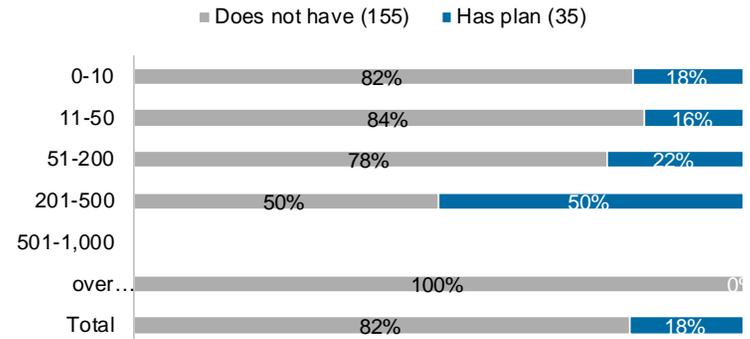
Engaged in water planning with content specifically addressing climate adaptation and resilience

		Number of employees in your organization						
		0-10	11-50	51-200	201-500	501-1,000	over 1,000	Total
Has plan (68)		37%	34%	28%	50%	-	100%	36%
Does not have (122)		63%	66%	72%	50%	-	-	64%
Total		117	50	18	4	-	1	190



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

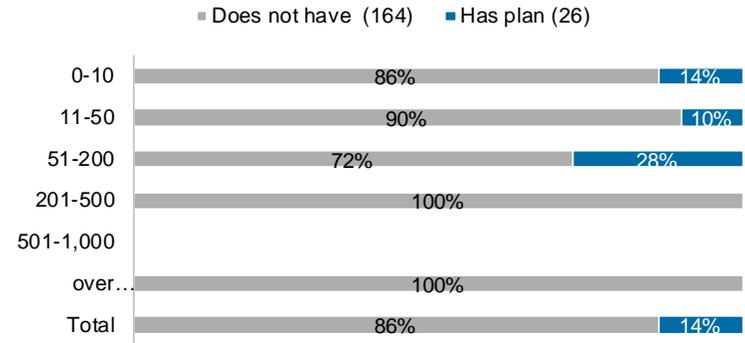
		Number of employees in your organization						
		0-10	11-50	51-200	201-500	501-1,000	over 1,000	Total
Has plan (35)		18%	16%	22%	50%	-	-	18%
Does not have (155)		82%	84%	78%	50%	-	100%	82%
Total		117	50	18	4	-	1	190



City results, continued

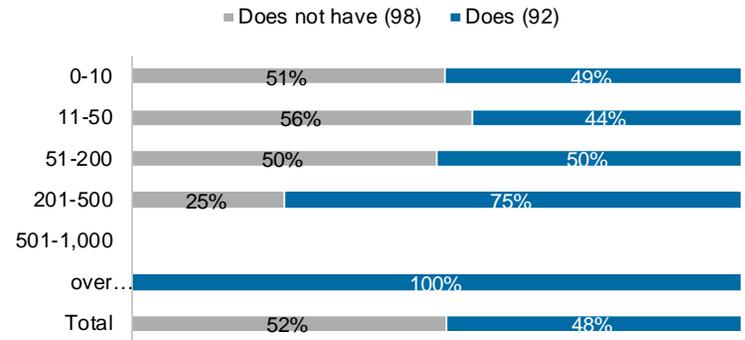
Engaged in any additional planning with content specifically addressing climate adaptation and resilience

		Number of employees in your organization						
		0-10	11-50	51-200	201-500	501-1,000	over 1,000	Total
Has plan (26)		14%	10%	28%	-	-	-	14%
Does not have (164)		86%	90%	72%	100%	-	100%	86%
Total		117	50	18	4	-	1	190



Engaged in any type of planning activity

		Number of employees in your organization						
		0-10	11-50	51-200	201-500	501-1,000	over 1,000	Total
Does (92)		49%	44%	50%	75%	-	100%	48%
Does not have (98)		51%	56%	50%	25%	-	-	52%
Total		117	50	18	4	-	1	190

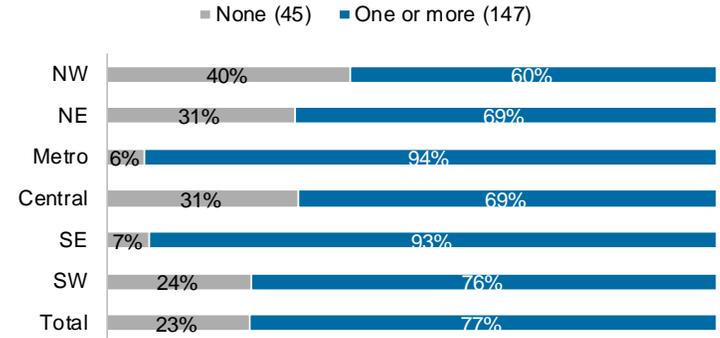


Cities: Types of Planning Activity by Region

192 respondents in data set

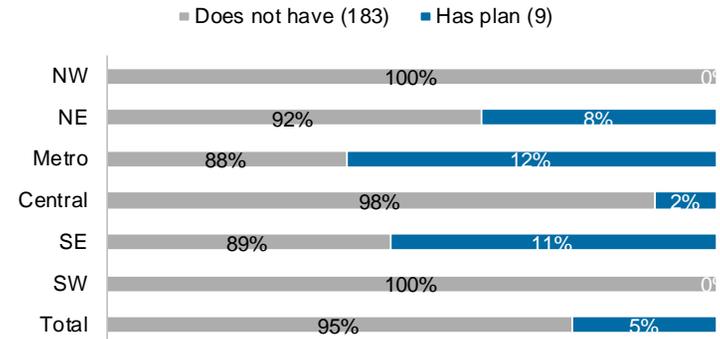
Experienced any event or trend connected to climate change

		Region						
		NW	NE	Metro	Central	SE	SW	Total
One or more (147)		60%	69%	94%	69%	93%	76%	77%
None (45)		40%	31%	6%	31%	7%	24%	23%
Total		30	13	33	51	28	38	192



Engaged in stand-alone planning activity specifically to address climate adaptation and resilience

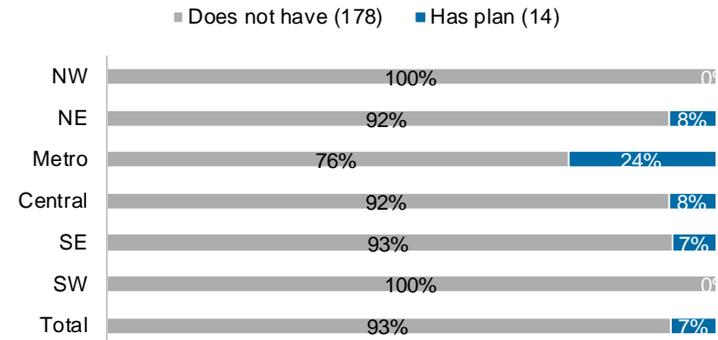
		Region						
		NW	NE	Metro	Central	SE	SW	Total
Has plan (9)		-	8%	12%	2%	11%	-	5%
Does not have (183)		100%	92%	88%	98%	89%	100%	95%
Total		30	13	33	51	28	38	192



City results, continued

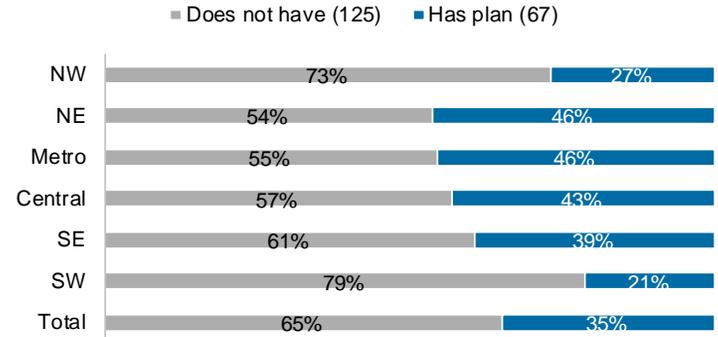
Engaged in comprehensive planning with content specifically addressing climate adaptation and resilience

	Region						
	NW	NE	Metro	Central	SE	SW	Total
Has plan (14)	-	8%	24%	8%	7%	-	7%
Does not have (178)	100%	92%	76%	92%	93%	100%	93%
Total	30	13	33	51	28	38	192



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

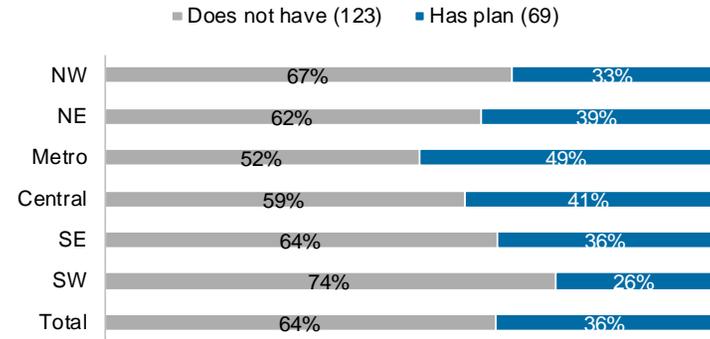
	Region						
	NW	NE	Metro	Central	SE	SW	Total
Has plan (67)	27%	46%	46%	43%	39%	21%	35%
Does not have (125)	73%	54%	55%	57%	61%	79%	65%
Total	30	13	33	51	28	38	192



City results, continued

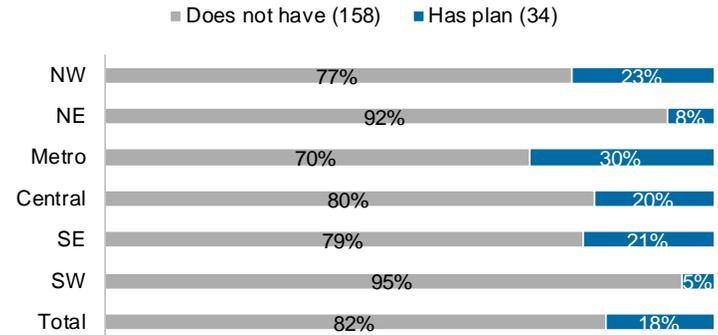
Engaged in water planning with content specifically addressing climate adaptation and resilience

	Region						
	NW	NE	Metro	Central	SE	SW	Total
Has plan (69)	33%	39%	49%	41%	36%	26%	36%
Does not have (123)	67%	62%	52%	59%	64%	74%	64%
Total	30	13	33	51	28	38	192



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

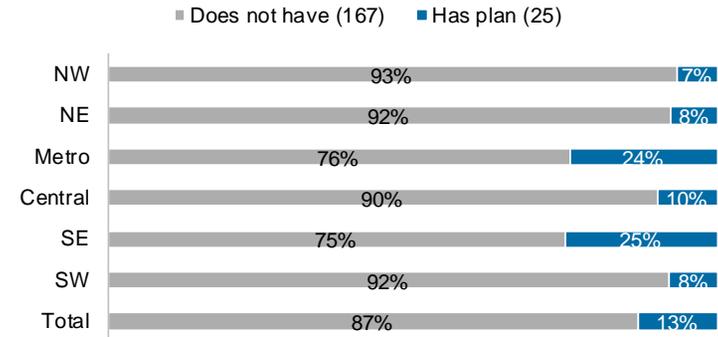
	Region						
	NW	NE	Metro	Central	SE	SW	Total
Has plan (34)	23%	8%	30%	20%	21%	5%	18%
Does not have (158)	77%	92%	70%	80%	79%	95%	82%
Total	30	13	33	51	28	38	192



City results, continued

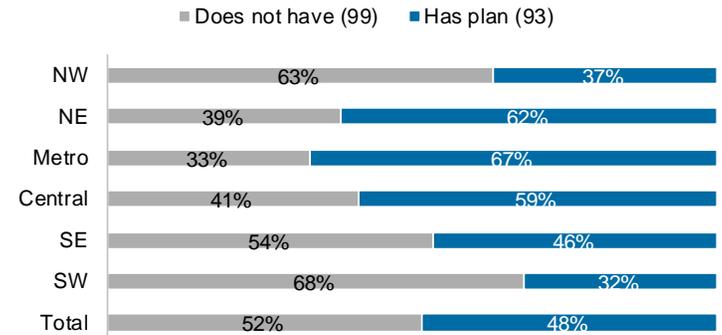
Engaged in any additional planning with content specifically addressing climate adaptation and resilience

	Region						
	NW	NE	Metro	Central	SE	SW	Total
Has plan (25)	7%	8%	24%	10%	25%	8%	13%
Does not have (167)	93%	92%	76%	90%	75%	92%	87%
Total	30	13	33	51	28	38	192



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

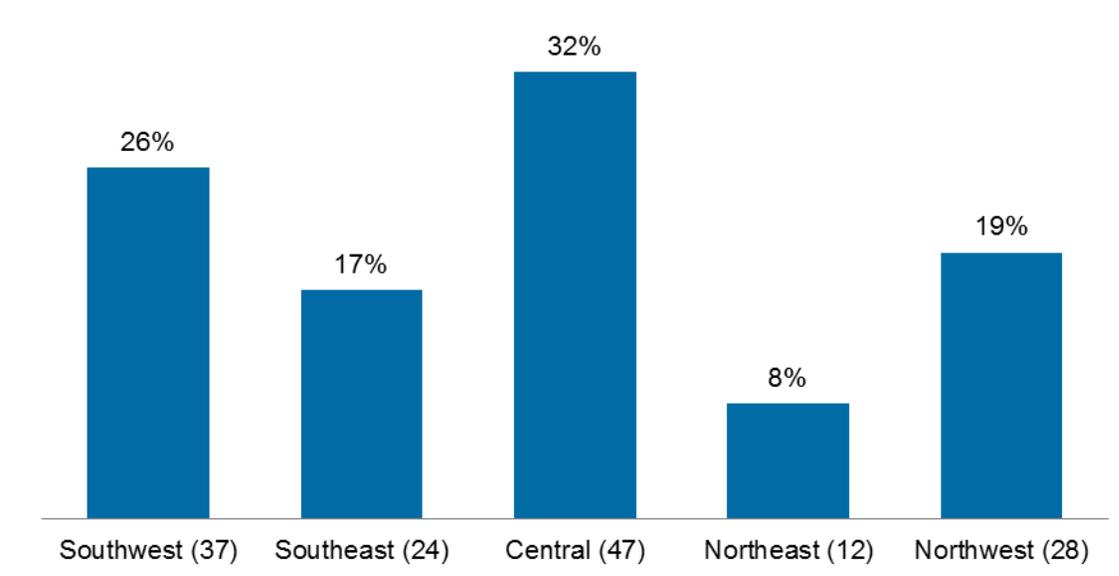
	Region						
	NW	NE	Metro	Central	SE	SW	Total
Has plan (93)	37%	62%	67%	59%	46%	32%	48%
Does not have (99)	63%	39%	33%	41%	54%	68%	52%
Total	30	13	33	51	28	38	192



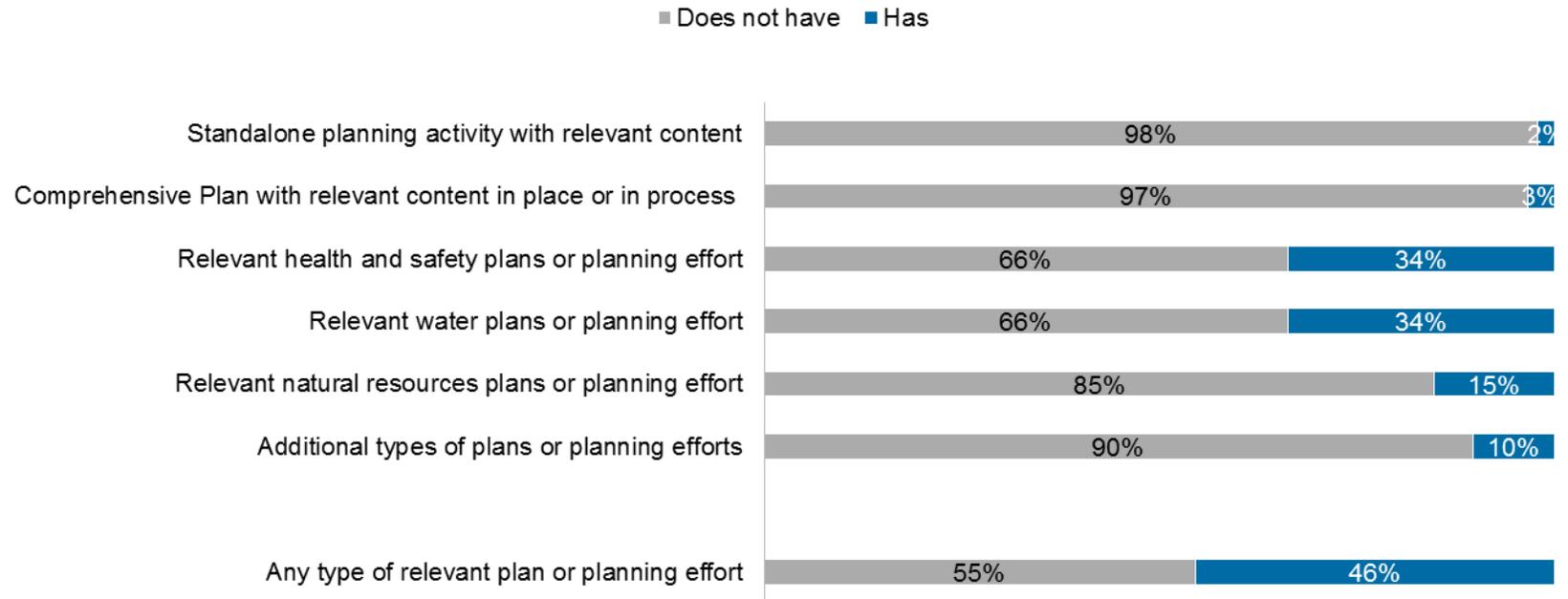
Appendix G. Small Cities in Greater Minnesota

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

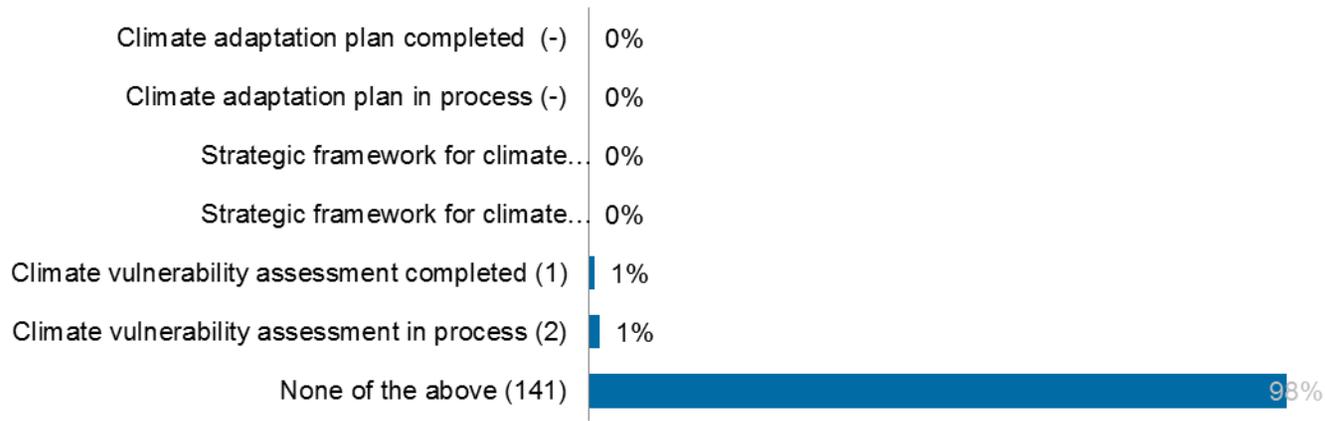
Small cities by region



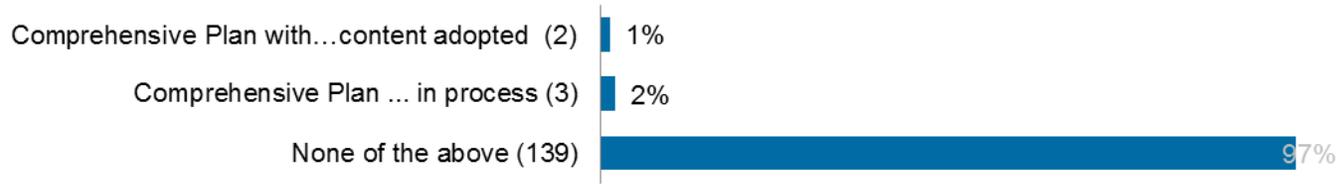
Overview: Small cities planning efforts by type of plan (n=145)



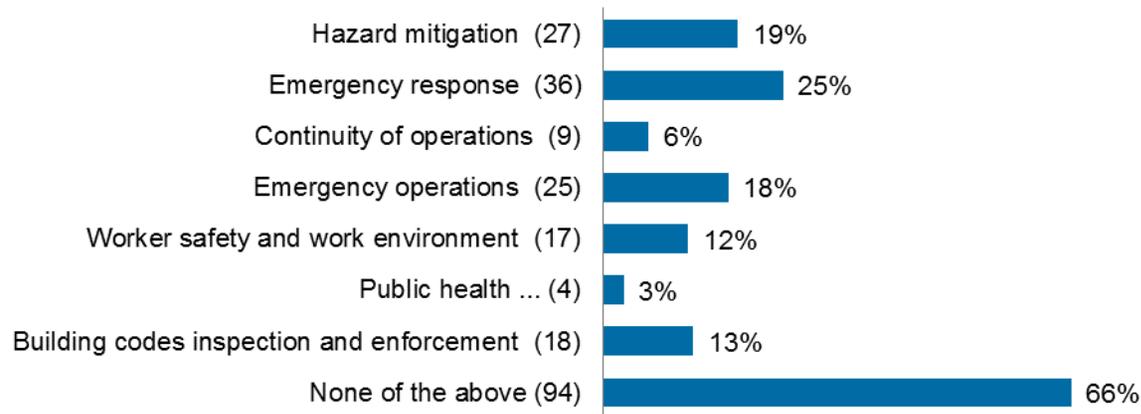
Small cities stand-alone planning: Survey question: *Has your organization engaged in any of the following standalone planning efforts specifically to address climate adaptation and resilience?*



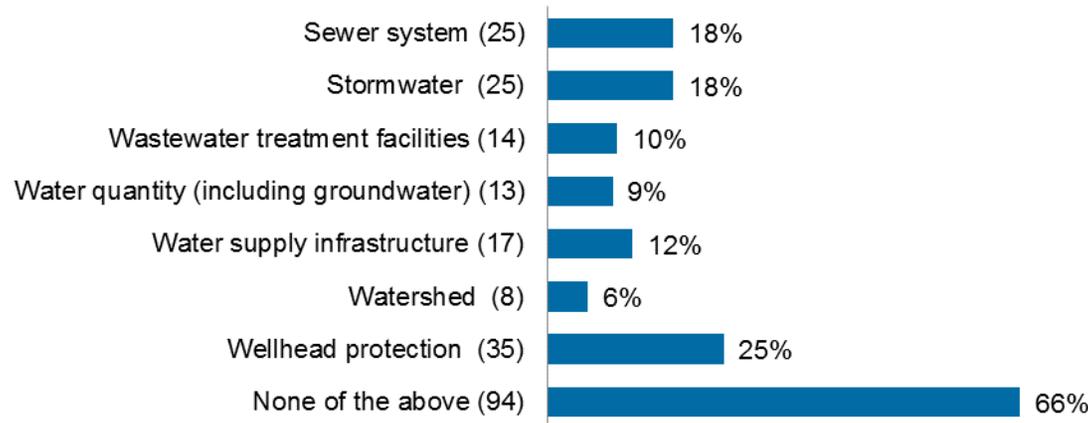
Small cities comprehensive planning: Survey question: *Does your organization have a comprehensive plan with content that specifically addresses climate adaptation and resilience?*



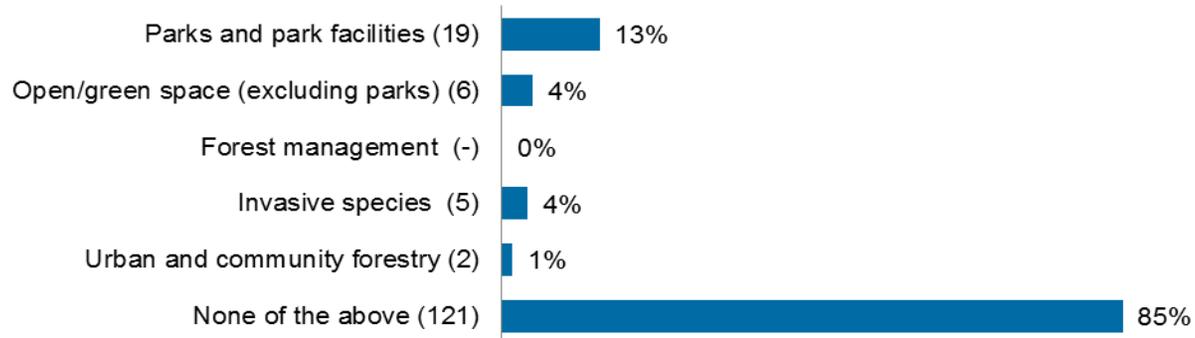
Small cities health and safety planning: *Survey question: Does your organization have any health and safety plans or planning efforts with content that specifically addresses climate adaptation and resilience?*



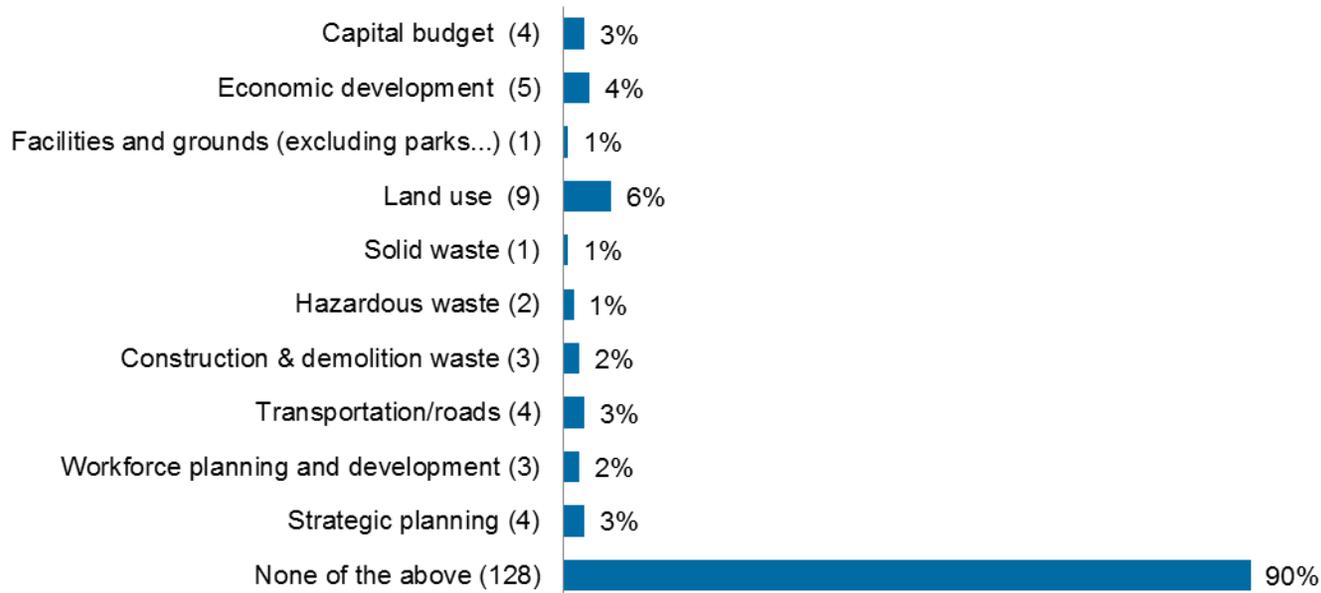
Small cities water planning: *Survey question: Does your organization have any water plans or planning efforts with content that specifically addresses climate adaptation and resilience?*



Small cities natural resources planning: Survey question: *Does your organization have any natural resources plans or planning efforts with content that specifically addresses climate adaptation and resilience?*

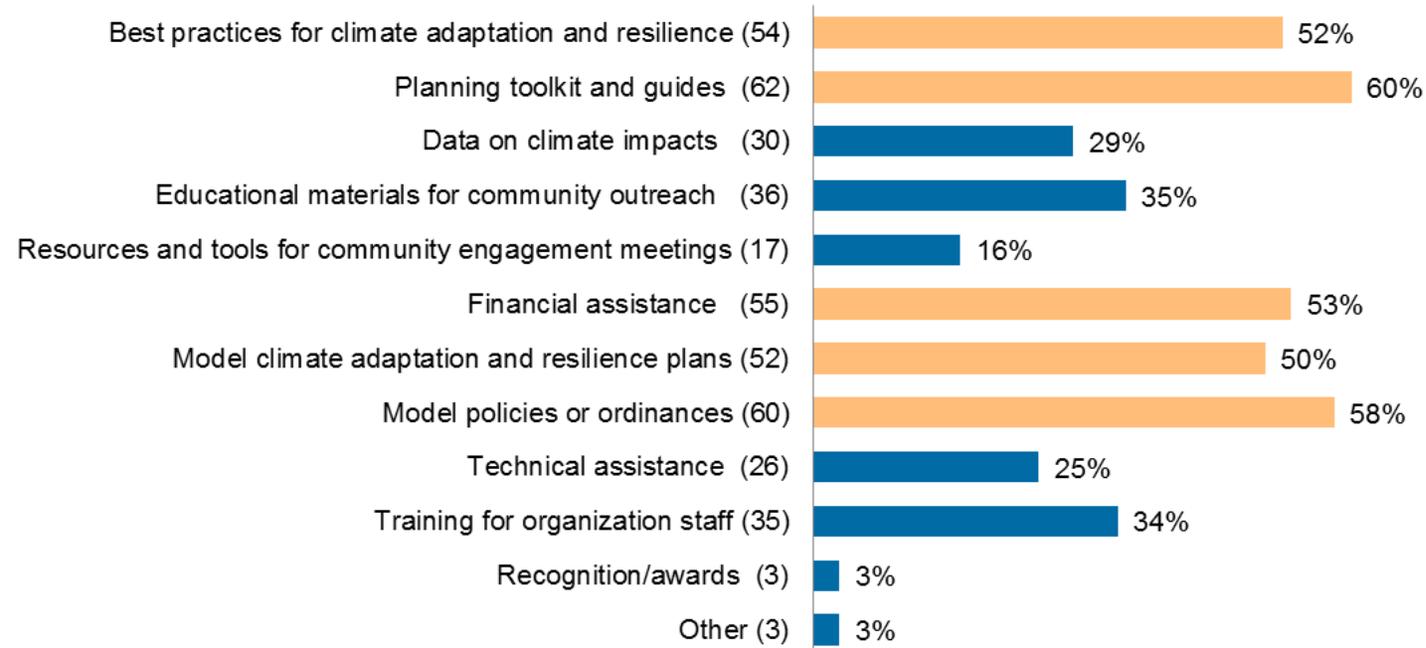


Small cities additional planning efforts: Survey question: *Has your organization engaged in any additional planning efforts with content that specifically addresses climate adaptation and resilience?*

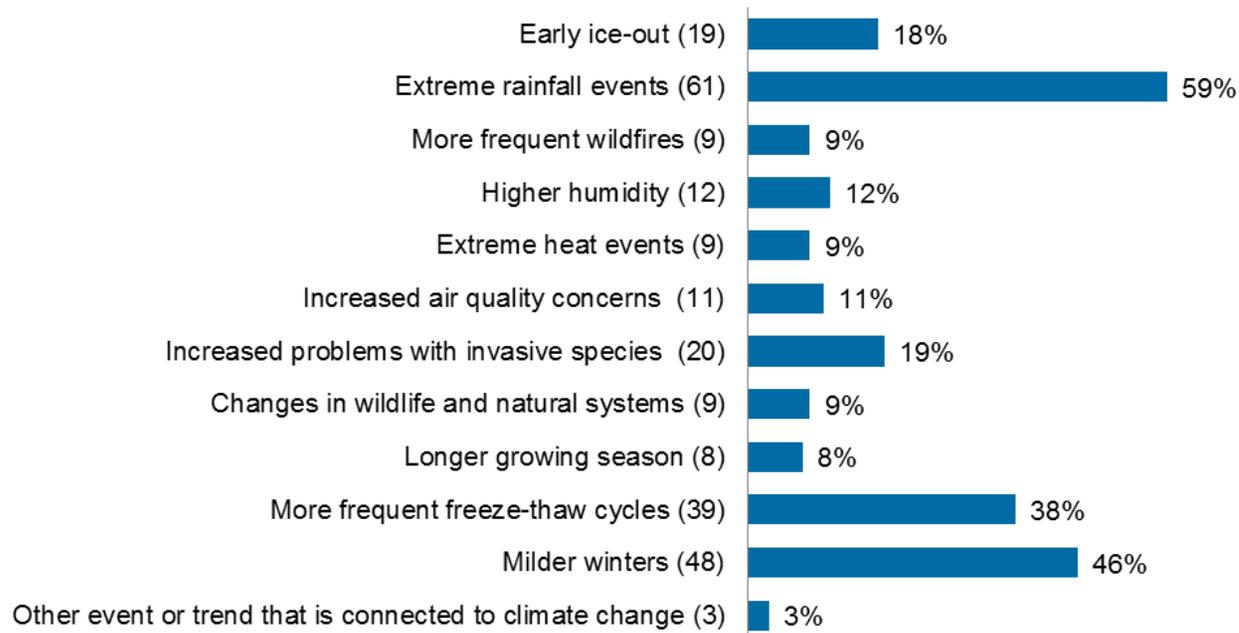


Small cities resources or assistance needed: *Survey question: What kind of resources or assistance would be most helpful to your organization for climate adaptation and resilience planning?*

The most common responses are displayed in orange.



Small cities experience with events or trends associated with the changing climate: *Survey question: The following types of events and longer-term trends are associated with the changing climate. In the past decade, have any of these affected your organization or community?*



Appendix H. Survey Results by Experience with Climate-Related Event or Trend

This appendix contains survey results comparing organizations that experience climate-related events or trends with those that did not identify these events or trends in their survey responses.

Organizations that experienced one or more climate-related event or trend (n=256)

Organization type	Percent
City (149)	55%
County (25)	9%
State (18)	7%
Tribal government (5)	2%
Watershed district (30)	11%
Soil and water conservation district (42)	16%

Region	Percent
Northwest (42)	16%
Northeast (17)	6%
Twin Cities metropolitan area (63)	24%
Central (53)	20%
Southeast (41)	15%
Southwest (54)	20%
Minnesota statewide (16)	6%

Size (number of employees)	Percent
0-10 (151)	59%
11-50 (38)	15%
51-200 (32)	13%
201-500 (16)	6%
501-1,000 (6)	2%
over 1,000 (11)	4%

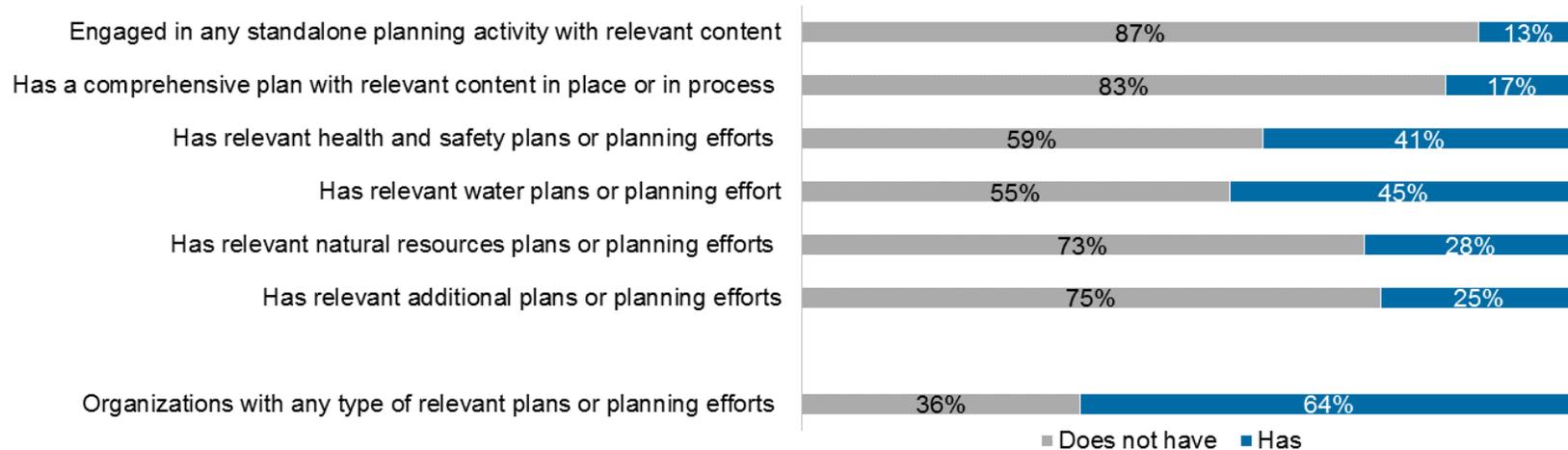
Organizations that did not identify climate-related events or trends (n=53)

Organization type	Percent
City (45)	92%
County (1)	2%
State (1)	2%
Tribal government (-)	-
Watershed district (2)	4%
Soil and water conservation district (-)	-

Region	Percent
Northwest (14)	29%
Northeast (4)	8%
Twin Cities metropolitan area (3)	6%
Central (17)	35%
Southeast (2)	4%
Southwest (9)	18%
Minnesota statewide (-)	-

Size (number of employees)	Percent
0-10 (31)	63%
11-50 (12)	25%
51-200 (5)	10%
201-500 (1)	2%
501-1,000 (-)	-
over 1,000 (-)	-

Planning efforts: Organizations that experienced climate-related event or trend (n=256)



Planning efforts: Organizations that did not identify climate-related event or trend (n=53)

