



DEPARTMENT
OF HEALTH

Minnesota Department of Health Climate & Health Strategic Plan

An update on program successes and next steps

April 2019



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Responding to the Health Impacts of Climate Change

The Minnesota Department of Health (MDH) developed the [Minnesota Climate and Health Strategic Plan](#) to prepare for and respond to climate change and its impacts on public health. The number and the extent of activities in this Plan reflect the willingness of staff and leadership to address the public health impacts of climate change.

The MDH Climate and Health Workgroup formed in December 2016 to:

- Make progress on the goals and objectives in the MDH Minnesota Climate and Health Strategic Plan.
- Ensure MDH programs are prepared for and responsive to climate changes in Minnesota.
- Build climate and health literacy by exchanging knowledge and information.

MEET OUR WORKGROUP

The workgroup has had on average 20-30 MDH staff actively participating at a given time, representing programs across almost all divisions and offices. See [Acknowledgments](#) for a full list of workgroup members.

MDH's Minnesota Climate & Health Program coordinates the agency-wide Strategic Plan and Workgroup on climate and health. This work is ongoing until climate change adaptation is fully integrated at MDH. The Minnesota Climate & Health Program will survey MDH staff every five years to measure climate and health knowledge and opinions (past surveys: 2010; 2015). MDH goals include:

- 90% of surveyed staff agree that Minnesota is currently experiencing climate change. (75% in 2010; 82% in 2015)
- 75% of surveyed staff agree that their division is working to prepare for and/or respond to climate changes in Minnesota. (New question to be added in 2020.)

The Status of Climate Change in Minnesota

Minnesota's climate is changing with serious consequences for human health and wellbeing. Minnesota is experiencing an increase in warmer, wetter conditions as well as an increase in extreme events and climate-related natural disasters. By mid-century, Minnesotans can expect much

warmer winters, a higher frequency of heavy rain events, more severe summer heat waves, and a higher frequency of drought conditions during the fall season. Climate projections indicate that these trends are likely to continue well into the future.

Warming and
wetter climate
trends

More frequent,
extreme rain
events

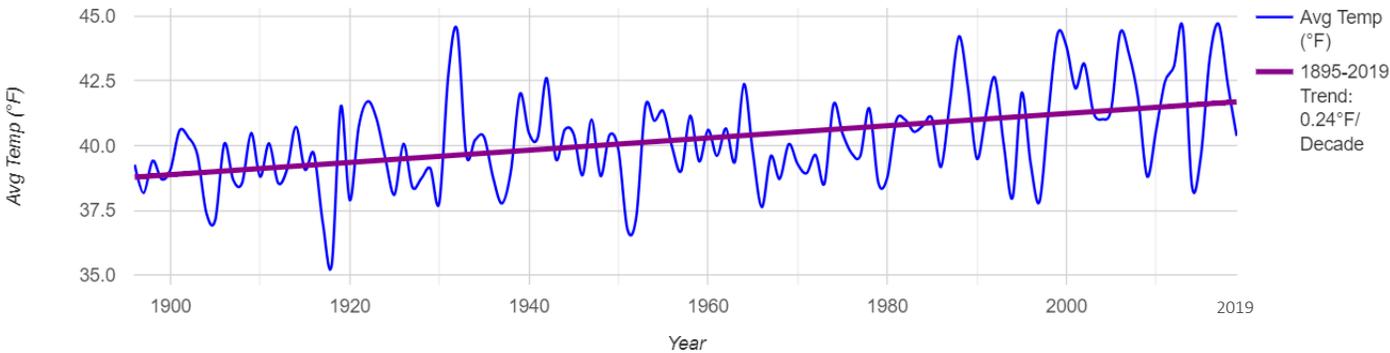
Warming
winters

Climate change has been called “the great amplifier,” increasing current public health risks, while also creating new risks. Some of the health impacts MDH is most concerned about in Minnesota include the following:

- injury and death from extreme weather events including heat waves and floods,
- disease from changing tick and mosquito populations,
- illness from drinking or swimming in contaminated water from increased runoff and floods,
- respiratory and cardiovascular impacts from increases in wildfires, ozone, fine particulate matter, pollen, and mold, and
- mental health impacts from experiencing an extreme weather event or from a loss of sense of place.

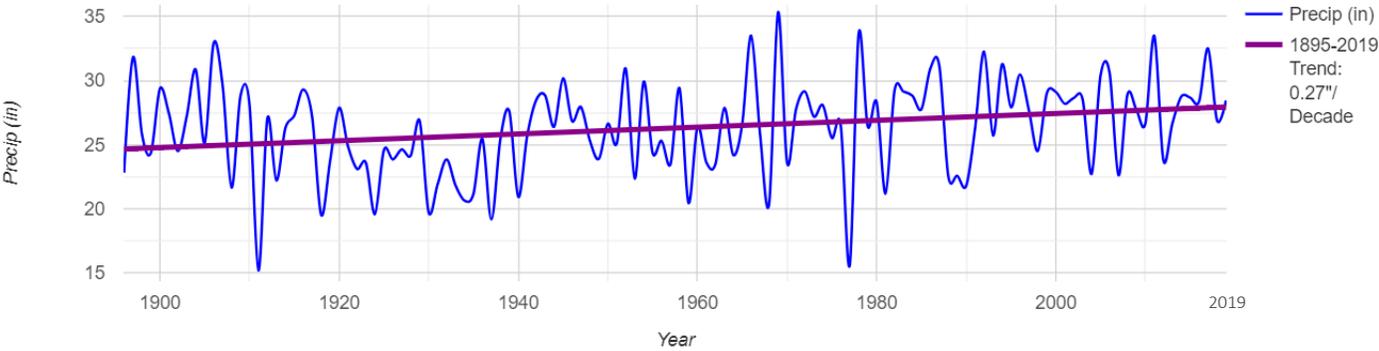
For more information on the impacts of climate change on public health, refer to the [Minnesota Climate and Health Profile Report 2015](#).

Average Temperature for Minnesota, February-January



Source: Minnesota Department of Natural Resources

Average Precipitation for Minnesota, February-January



Source: Minnesota Department of Natural Resources

The Minnesota Climate and Health Program

Climate change is already harming our health. With climate changes intensifying, the Minnesota Climate & Health Program focuses on improving our ability to protect public health and prevent further harms from climate change. We do this by engaging, informing and guiding health and climate adaptations and champions throughout our State to create healthy, equitable and resilient communities.

We do this by:

- **Education** (Engage). Resonate with the hearts and minds of the public, influencers and decision-makers to build a culture of health and climate action.
- **Research** (Inform). Conduct credible, rigorous and innovative research to facilitate health and climate in all policies.
- **Capacity Building** (Guide). Provide technical assistance, tools and products to expand and accelerate health and climate solutions.

Program History



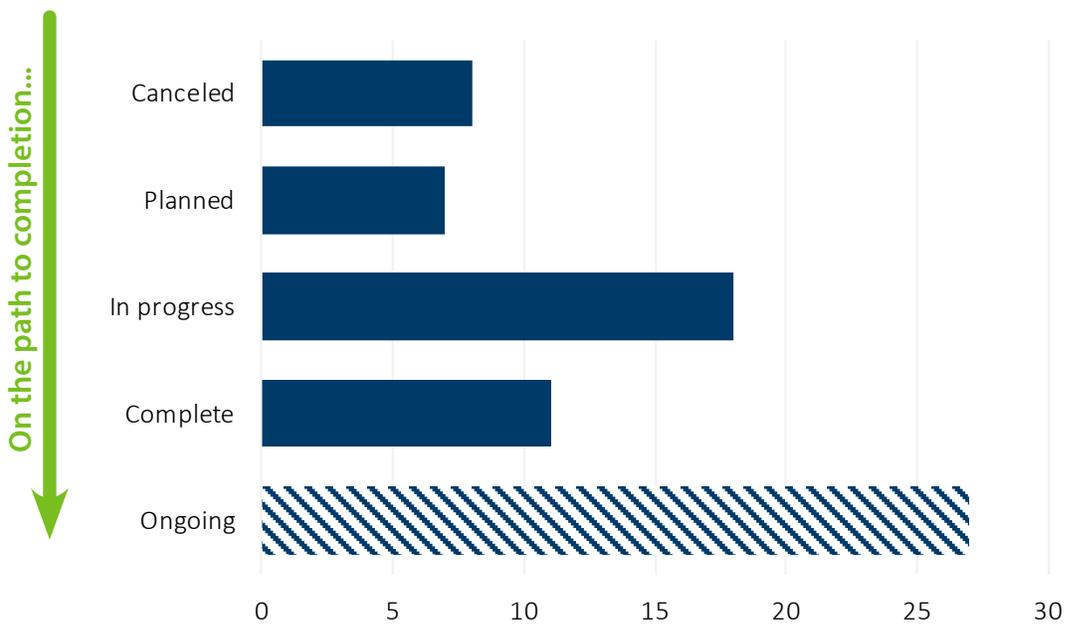
Climate and Health Strategic Plan

MDH’s Minnesota Climate and Health Strategic Plan contains seven goals and 23 objectives. The Plan outlines 60 active activities to address the health impacts of climate change in Minnesota. By the end of 2018, staff completed 11 activities and indicated another 18 as in progress. Staff are working on 27 other activities on an ongoing basis (e.g., surveillance, routine training, and response). Nine activities were not started, but Workgroup members plan to explore or undertake them in upcoming years. Eight activities have been canceled due to various reasons (e.g., no longer a need).

60 activities to address the health impacts of climate change

The following section highlights efforts across MDH that are being tracked by the Plan. These efforts are organized by high-level themes and have an identifying number within the parentheses to easily locate its parent activity(s) within the [Minnesota Climate and Health Strategic Plan](#).

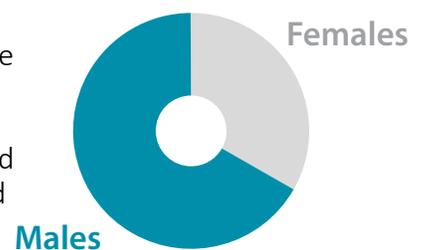
Climate and Health Activity Status



Making Data Available and Accessible

The **Environmental Public Health Tracking Program** evaluated and added data on pollen, heat index, Lyme disease, and West Nile Virus to the [Minnesota Public Health Data Access Portal](#), which makes data on health and the environment publicly available and easy to access online. (1a2)

Climate & Health Fact Although everyone can be affected by the heat, some people are at greater risk for heat-related illness than others.



Males are about twice as likely to visit the emergency department for heat-related illness as females.

The **Minnesota Climate & Health Program** is developing an open access, online climate and health vulnerability assessment tool that can be utilized by professionals from several disciplines to connect to health when planning for climate change. A climate and health vulnerability assessment can help identify the people and places that are more vulnerable to health impacts of climate change and prioritize ways to reduce negative health impacts. (3a1)

Climate & Health Fact People older than 65 may have more difficulty responding to weather extremes, as they tend to have higher rates of underlying physical and mental ailments that contribute to overall vulnerability.

Growing elderly population

By 2035, the age 65+ group is expected to eclipse the under 18 population for the first time in our state's history.

Improving Testing Capabilities

98 Confirmed cases

In 2017, 98 confirmed cases of Legionnaires' disease were reported in Minnesota. This was the second highest number ever reported.

The **Public Health Laboratory** developed a new rapid test for *Legionella* bacteria in response to rising cases of Legionnaires' disease in Minnesota and across the United States. Legionnaires' disease is a serious type of pneumonia that is caused by breathing in the bacteria. (1d2)

Climate & Health Fact The World Health Organization suggests that *Legionella* bacteria may benefit from increased heat and precipitation due to climate change.

The **Well Management Section** will work on enhancing services and improving communications for private well users impacted or preparing for a flood. MDH will ensure that test kits are readily available for private well users via local public health departments or Soil and Water Conservation Districts and work to improve sample turnaround. (1d4, 2f1, 4b5, 5c1)



One in five people in Minnesota gets their drinking water from a private well.

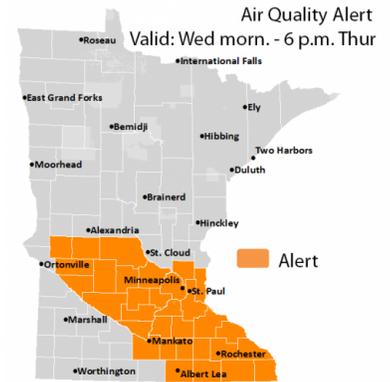


We have a responsibility to keep drinking water safe for our communities, other states and nations, and future generations. I take a lot of pride in my role of protecting our water resources and the health of Minnesotans.

-Kara Dennis, MDH Hydrologist

Coordinating Health-Focused Alerts

The **Minnesota Climate & Health Program** worked with the Minnesota Pollution Control Agency (MPCA) to develop health-based Air Quality Alert templates (particulate matter, ozone and air quality days with extreme heat) and launch the new air quality forecast and alert program. MDH also distributes Air Quality Alerts to at-risk populations and other stakeholders in coordination with MPCA to provide more Minnesotans with the information they need to protect their health. (2d4)



Air Quality Alert

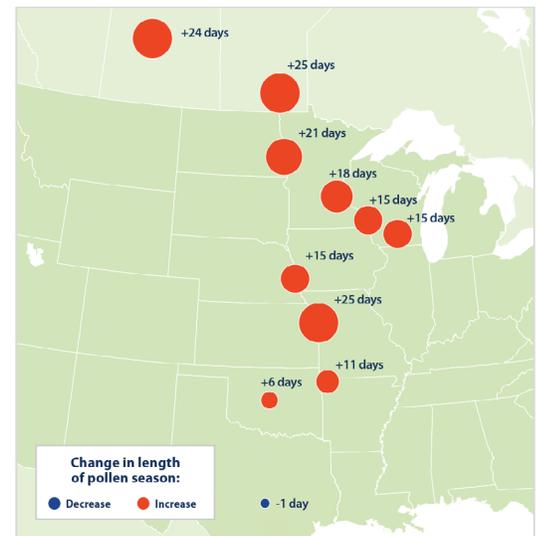
Source: MPCA, 2019

Climate & Health Fact Annual average temperatures are rising due to climate change. This is priming drier conditions and reducing snowpack, especially in the West, which is increasing wildfire risk. Minnesota has had 26 air quality alerts since 2015 and 14 of those were because of wildfire smoke. That’s nearly double the number of smoke-related alerts that were called in the previous seven years.

The **Asthma Program** publicizes the availability of emailed pollen alerts to people with allergies/asthma and health care providers. People with asthma need to be especially aware of pollen sources and seasons to prevent an allergy-related asthma attack. In Minnesota, asthma affects one in 14 children and one in 13 adults. (2d1)

Change in Ragweed Season, 1995-2015

Source: EPA, 2016



Climate & Health Fact

Climate change is expected to increase pollen production, lengthen the pollen season, and increase the potency of airborne allergens. The season in Minnesota for ragweed pollen, one of the most common causes of seasonal allergies, has increased by 18-21 days from 1995-2015.

Coordinating Surveillance



Blacklegged ticks (“deer ticks”), which carry Lyme disease, are most active on warm, humid days.

The **Vectorborne Diseases Unit** continues to coordinate surveillance for diseases caused by mosquitoes and ticks and added a new field sampling location. Lyme disease – the most common tickborne disease in Minnesota – has been increasing over the years (913 median cases from 2000- 2008; 1,203 from 2009-17). (1d1)

Climate & Health Fact Climate change can impact conditions that are more favorable for mosquitoes and ticks – such as humidity, temperature, rainfall, and severity of winter.

Harmful algal blooms

There have been 15 Minnesota lakes or rivers with HABs linked to a suspected human and animal illness since 2014.

The **Waterborne Diseases Unit** will continue to coordinate surveillance for waterborne diseases and explore developing a survey for online harmful algal bloom (HAB) related-illness reporting. MDH uses a One Health approach for HAB-related illness surveillance and tracks illnesses in both humans and animals. This multifaceted approach allows MDH to better understand the incidence and distribution of HABs in Minnesota. (1d3)

Climate & Health Fact Harmful algae prefer warm, nutrient-rich water and may become more common due to increasing temperatures and runoff events.



Minnesota is unique in that we have a robust, stand-alone Vectorborne Disease Unit at MDH. It is our goal to maintain strong infrastructure to continue our work. If a new disease emerges in the face of climate change, we will be ready to take it on.

- Molly Peterson, MDH Vectorborne Disease Epidemiologist



Promoting Protective Behaviors

The **Center for Health Equity** collaborated on [providing a training](#) for Minnesota Community Health Workers to increase awareness about Minnesota’s changing climate, the health impacts of climate change, who is at greatest risk for health problems due to climate change, and strategies for communities to adapt to climate change. (6b2)



Climate & Health Fact Climate change can worsen existing health and social inequities. For example, long-term exposure to air pollution can raise the risk of developing heart disease. Racial and ethnic minorities, including African Americans and American Indians, whose histories in the U.S. are marked by severe trauma and who today are often disadvantaged in terms of income and education, experience higher rates of heart disease.



The **Family Home Visiting Program** provided information to family home visiting nurses about actions pregnant and parenting teens could take to protect themselves and their children from health impacts related to climate change. Priority climate-related hazards for teens and children include air quality, extreme heat, diseases spread by ticks and mosquitoes, water quality, and extreme weather events. (2d3)

Climate & Health Fact Children, especially those under 5 years old, have a greater risk of heat-related illness due to a number of factors. They’re dependent on other people for their care and there are distinct physical differences that make them more at-risk, including smaller body mass, production of more heat per pound of body weight, and a weakened thirst response.

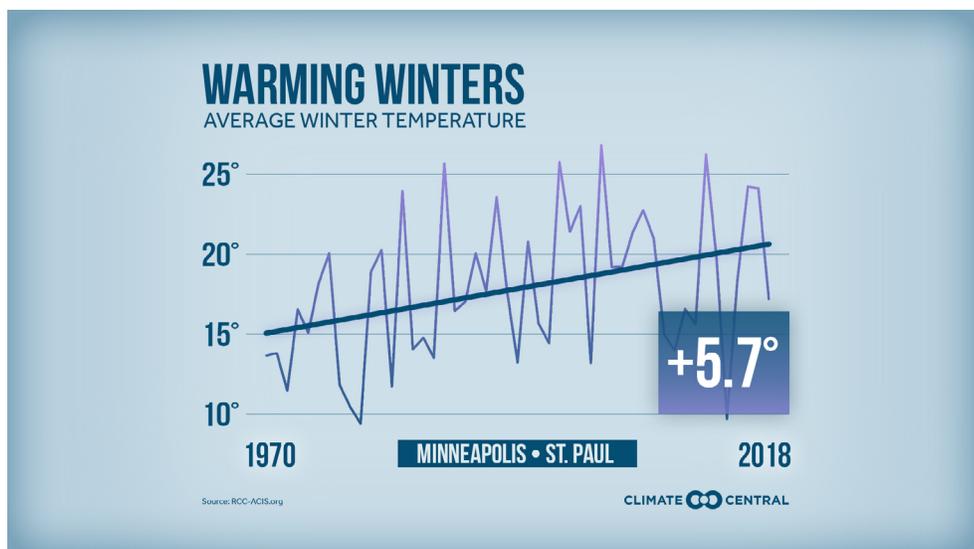
Strengthening Relationships

The **American Indian Health Director** at MDH collaborated to plan the first Tribal Environmental Health Meeting in June 2018 where the theme was “Responding to a Changing Climate.” (6b5)

“As the climate changes, subsistence resources such as mooz (moose), ogaa (walleye) and manoomin (wild rice) will change. Impacts to the Bands and the exercise of treaty rights will be magnified since reservations and treaty areas have geographically defined boundaries that do not allow them to follow shifts or changes in natural resources that occur as the climate changes.”
– 1854 Treaty Authority.

The **Minnesota Climate & Health Program** is joining conversations with partners across the state regarding warming winters and solastalgia (the distress caused by environmental change). MDH is partnering with St. Scholastica and Macalester on a research project to describe mental/emotional impacts related to climate change that mental health providers are seeing in patients. (1b7)

Climate & Health Fact In Minnesota, 71% of weather stations have been reporting more winter precipitation falling as rain. Minneapolis ranks fifth in U.S. cities experiencing the largest decline in winter precipitation falling as snow (since 1949).



Average Winter Temperature, 1970-2018

Source: Climate Central, 2019

Conducting Research

55,000 Minnesotans

55,000 people in Minnesota are currently depending on wells located in a designated floodplain for drinking water.

The **Minnesota Climate & Health Program** recently published research in the Journal of Climactic Change: [Vulnerability assessment of future flood impacts for populations on private wells: utilizing climate projection data for public health adaptation planning](#). Vulnerability assessments help target and prioritize public health efforts. (2b4)

Climate & Health Fact Climate projections indicate that by mid-century, 80 of Minnesota counties will experience June extreme rainfall levels historically associated with disaster-level flooding.

The **Indoor Air Unit** is conducting a literature review to identify data gaps and limitations related to tracking health outcomes from exposure to indoor air contaminants that are predicted to increase as the climate changes, such as mold and radon. (1c3)

Climate & Health Fact The most extreme dew point values are becoming more frequent and extreme over time in Minnesota, creating more favorable conditions for mold growth. Efforts to weatherize buildings to increase resilience to severe weather and increased heat/dew points could unintentionally increase exposure to radon gas (the leading cause of lung cancer for nonsmokers).

Developing Policies

The **MN Climate & Health Program** worked with state agency partners to develop and prioritize state-level actions for adapting and responding to climate changes in Minnesota. Recommendations in the [2017 Report of the Interagency Climate Adaptation Team](#) centered around six priority areas: extreme precipitation, vulnerable populations, agricultural water impacts, ecosystems/habitat, population centers, and communication. (2e2)

Climate & Health Fact To plan for climate changes and guide how we adapt, MDH and other state agencies are supporting the use of climate projection data. Climate projection data simulates future climate variables, such as temperature, rainfall, snow cover and a variety of other parameters.

The **Healthy Communities Unit** will continue to support health in state policies and programs regarding Connected and Autonomous Vehicles (CAVs). MDH participated on a Governor’s Council to provide recommendations in a [2018 Executive Report](#). CAV efforts are part of the Unit’s broader work to promote safe and healthy transportation options in the state, especially active transportation. (6a9)

Climate & Health Fact CAV testing and deployment is rapidly advancing across the country, with legislation in 29 states allowing testing or full deployment of CAVs. The decisions Minnesota makes today about CAVs can greatly transform future accessibility, equity, environmental sustainability, and public health.



We know biking and walking are the most sustainable options for transportation—both reducing greenhouse gas emissions. Minnesota Walks is our statewide framework for creating safe, walkable communities for Minnesotans.

- Ellen Pillsbury & Elizabeth Bina, MDH Active Living Team



Planning

37% Increase

There has been a 37% increase in the amount of very heavy precipitation in Minnesota since 1958 and of the 15 mega-rain events that have occurred since the late 1800s, seven of them have occurred since 2002.

The **Drinking Water Protection Section** works to make sure public utilities are prepared for climate changes like increased precipitation and potential for flooding. MDH staff are integrating information about climate change into [Groundwater Restoration and Protection Strategies](#) (GRAPS). As part of the GRAPS process, MDH will work in 81 major watersheds to evaluate water conditions, establish priorities and goals for improvement, and take actions designed to restore or protect water. (1e1).

Climate & Health Fact In 2018 alone, nine Minnesota utilities activated the [MNWARN](#) emergency response system for assistance with flooding. Precipitation patterns are changing in Minnesota and could lead to more flooding.



The **Emergency Preparedness and Response Section** will update two planning processes to ensure they take climate change into account: the MDH All Hazards Response and Recovery Plan (goal is to enhance the public health and health care system's ability to effectively respond to public health threats) and the MDH Risk and Threat Assessment (goal is to evaluate the likelihood and severity of potential public health threats to Minnesota residents to help identify emergency planning priorities). (4a1 and 4a2)

Conclusion

The Workgroup will continue to meet quarterly and work towards completing activities in the Plan. The Plan will be reviewed and updated in 2021. MDH staff should contact health.climatechange@state.mn.us if they are interested in participating on the Workgroup or have questions about how their program can prepare for and respond to climate changes in Minnesota.



Climate change is the critical issue of our time—affecting virtually every aspect of life as we know it. The consensus among public health experts is that climate change poses significant population-level health threats, making it priority work for public health agencies.

- John Olson, MDH Business Process and Policy Specialist

Acknowledgments

American Indian Health

- Jackie Dionne, American Indian Health Director

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Community Health (CH)

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Environmental Health (EH)

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- Stephanie Gretsche, Epidemiologist – Waterborne Diseases

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- Joanne Barktus, Division Director

All Climate & Health Program staff participate on the Workgroup: Kristin Raab, Program Director; Nissa Tupper, Program Manager; Emmy Waldhart, Program Planner and Workgroup Coordinator; Brenda Hoppe, Research Scientist; Micaela Resh, Health Educator; David Bell, Research Scientist; Kristen Kellock, Toxicologist.

Other acknowledgments: Chris Kimber (retired) was integral in writing the Minnesota Climate and Health Strategic Plan.