

# **Michigan Climate and Health Adaptation Plan (MI-CHAP)**

## **2010 – 2015 Strategic Plan**

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**Prepared by**

**Michigan Department of Community Health  
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## Foreword

There is widespread scientific consensus that the world's climate is changing. The effects of climate change are likely to include increasingly variable weather, heat waves, heavy precipitation events, flooding, droughts, intense storms, and air pollution. Each of these effects has the potential to negatively impact the health of Michigan's citizens.

Although scientific understanding of the effects of climate change is still emerging, there is a pressing need to prepare now for potential health risks. We at the Michigan Department of Community Health (MDCH) were funded in 2009 (1) to develop a strategic plan to prepare Michigan's state and local public health community for these potential health risks. This document is the product of that year-long effort. We sincerely thank our many partners who participated in the development of this plan from state government, academia, nonprofits, and in particular, from local health departments across our state.

In September, 2010 MDCH received three years' funding (2) to implement this plan as part of the Climate-Ready States and Cities Initiative (3) of the Centers for Disease Control and Prevention. We are pleased to be able to continue this important work with our state and national partners. I invite you to visit our web site ([www.michigan.gov/climateandhealth](http://www.michigan.gov/climateandhealth)) for information and resources related to climate change. Please feel free to contact me at the email address below with any questions you may have.

Best wishes,



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(1) *Building capacity for climate change and public health programs at state/territorial health agencies*, Association of State and Territorial Health Officials (ASTHO), June 2009.

(2) *Developing public health capacity and adaptations to reduce human health effects of climate change*, Centers for Disease Control and Prevention (CDC), RFA-EH10-1006, September 2010.

(3) [www.cdc.gov/climatechange/climate\\_ready.htm](http://www.cdc.gov/climatechange/climate_ready.htm)



# Michigan Climate and Health Adaptation Plan (MI-CHAP) 2010-2015 Strategic Plan

## I. Approach

The intent of this strategic plan is to prepare the Public Health System in Michigan to address the public health consequences of climate change in a coordinated manner. The Public Health System includes the state (Michigan Department of Community Health, MDCH) and local health departments (LHDs), as well as key partners in other parts of state government, academia, health care, professional organizations, non-profits and others whose work relates to public health and/or the environment. This effort seeks to build a statewide vision with a diverse, large group representing multiple perspectives and expertise.

The process included the following activities by the MDCH planning project team:

1. Contact and solicit input and participation from Health Officers, Environmental Health Directors, Emergency Preparedness Coordinators and others in LHDs to determine current attitudes, activities, needs, and priorities and their relationship to climate events.
2. Identify and solicit participation from other key partners including those with expertise in climate change, the environment and emergency preparedness order to explore their scientific and experiential knowledge.
3. Determine with the LHDs and key partners the priority needs and concerns regarding climate change and health to be addressed in a Michigan strategic plan.
4. Strengthen public health's presence in climate change-related activities by taking actions to increase the State's preparedness for climate events, and to create tools to increase awareness, prevention, and protection for ALL Michigan populations, with special attention to those most vulnerable.

## II. Background

Global warming and other evidence of climate change have been reported in the research literature for a number of years, and there is scientific consensus that the climate is changing. In 1989, the U.S. Environmental Protection Agency (USEPA) began its assessment of climate change through the US Global Change Research Program. Through this program, USEPA has produced periodic assessments of the effects of climate change in a variety of sectors including human health ([www.climatescience.gov/Library/sap/sap4-6/final-report/](http://www.climatescience.gov/Library/sap/sap4-6/final-report/)) Health scientists have been conducting their own assessments of the potential public health effects of climate change, most notably a summary by Dr. Howard Frumkin, former Director of the National Center for Environmental Health at CDC. His paper also discusses the public health services needed to address each of the health effects (Frumkin H, et al. *Climate change: the public health response*. Am J Public Health. 98:435-445, 2008). Major public health effects to be addressed include: storms and extreme weather events resulting in injuries and mental stress; heat waves resulting in heat stress; increased ozone, pollen formation, and air pollution resulting in respiratory and

cardiovascular distress; floods and increased temperature, resulting in increased vector-borne diseases and food and water-borne diseases; and disruption of food and water supplies due to weather changes, resulting in food and water shortages and social unrest.

Some regional and Michigan-specific assessments of climate change impacts have been done ([www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/regional-climate-change-impacts/midwest](http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/regional-climate-change-impacts/midwest)), ([www.ucsusa.org/greatlakes/](http://www.ucsusa.org/greatlakes/)) The changes specifically expected for Michigan include a generally warmer and drier climate, however with increased number (by up to 100%) and severity of heavy rain and lake effect snowstorms resulting in injury and electrical power loss. Of particular concern are more frequent extreme heat events that are projected to double or triple in number for Detroit, with temperatures exceeding 90°F approximately 30-50 days per year and exceeding 97°F approximately 25-50 days per year. Other anticipated results include: more flooding and water pollution due to heavy rainstorms, resulting in increased waterborne diseases outbreaks; drought leading to declining water levels with poorer water quality and increased accumulation of mercury and other contaminants in sport fish, a major food source for some groups in Michigan; increasing numbers of forest fires adding to particulate air pollution and drought; deposition of atmospheric nitrogen in water, adding to drinking water degradation; and increasing incidence of Lyme Disease, West Nile encephalitis, and other insect-borne infectious diseases.

Current approaches to climate change differentiate between mitigation and adaptation. **Mitigation** approaches are actions taken to reduce or ameliorate the causes of climate change, such as greenhouse gas emissions; **adaptation** approaches are actions taken to prepare for and deal with the effects of climate change (<http://www.pewclimate.org/docUploads/Climate101-Adaptation-Jan09.pdf> page 3). Several states, including Michigan, have begun to address climate change by forming plans. Most of these, including Michigan, have completed their mitigation planning, but relatively few have begun to consider adaptation planning. There is a need for more state-based models for planning public health-based adaptations. The Michigan Climate Action Plan ([www.michigan.gov/deq/0,1607,7-135-50990-213752--,00.html](http://www.michigan.gov/deq/0,1607,7-135-50990-213752--,00.html)) released March 1, 2009, has identified as a next step the development of specific adaptation plans, including adaptation for impact on public health. The Centers for Disease Control and Prevention (CDC) has begun to support state and local efforts to plan for climate change adaptations (see: [www.cdc.gov/climatechange](http://www.cdc.gov/climatechange)).

### III. The Strategic Planning Process

In September 2009, MDCH began a one-year process of developing a strategic plan for addressing the public health impacts of climate change, with funding from the Centers for Disease Control and Prevention (CDC), through the Association of State and Territorial Health Officials (ASTHO). The strategic plan was developed following established processes that have been utilized by government agencies and non-profit organizations, using the Ten Essential Public Health Services ([www.cdc.gov/nceh/ehs/Home/HealthService.htm](http://www.cdc.gov/nceh/ehs/Home/HealthService.htm)) and the National Environmental

Public Health Performance Standards ([www.cdc.gov/nceh/ehs/envphps/](http://www.cdc.gov/nceh/ehs/envphps/)) as a framework. The process included conducting a needs assessment; engaging stakeholders from communities, academia, and state and local agencies in a process to evaluate and prioritize activities; and preparing, vetting, and gaining approval of the written plan.

Development of the plan included identification of key partners within state government, state and local public health, academia, and non-profit organizations; engaging partners in a needs assessment; and meeting with partners using a structured strategic planning process. The needs assessment collected information necessary to define the status and gaps regarding public health adaptation strategies that reduce the impacts of climate change in Michigan and was based on the Ten Essential Public Health Services. One needs assessment was a structured interview of thirty-four LHD health officers or senior staff and was modeled after the George Mason survey of health officials ([www.edf.org/documents/7846\\_AreWeReady\\_April2008.pdf](http://www.edf.org/documents/7846_AreWeReady_April2008.pdf)). A second needs assessment was conducted as a series of key informant interviews with staff from other parts of MDCH, other state agencies, academia, and non-governmental organizations. Both surveys revealed a widespread interest and a strong desire to identify and collaborate with other organizations to address this issue; however, also revealed was a lack of knowledge regarding health impacts of climate change and a lack of resources to address these issues. Furthermore, many of the LHDs voiced desire for support and leadership from MDCH.

Two strategic planning sessions occurred on March 23 and April 23, 2010, with approximately 35 participants at each from LHDs, the Michigan Department of Natural Resources and Environment, the MDCH Office of Public Health Preparedness (OPHP) and Communicable Diseases Division, Michigan State Police, the University of Michigan (UM), Michigan State University (MSU), the Michigan Public Health Association and several advocacy groups (Sierra Club, Michigan Environmental Council, Ecology Center). (Copies of materials related to the planning process, including participant lists, needs assessment survey instruments and survey results, are available from MDCH on request). The goals of the strategic plan grew out of structured discussion in the two planning sessions about core principles and values and the issues confronting public health and climate change. That discussion was followed by identification of key issues that will need to be addressed in order to achieve success in meeting the goals, and a statement of commitment by participants to move the process forward. All this information was used by the MDCH staff to write a plan that develops services and programs for BOTH what are and what might be the impacts of climate change on public health.

#### **IV. Strategic Planning Results**

##### ***A. Plan rationale, core beliefs and goals:***

The strategic planning group accepted the following **rationale**: There is scientific consensus that global climate is changing, including: 1) Rising surface temperatures, 2) Increasing number of extreme weather events including heat events, storms and floods, 3) Increasing intensity of extreme weather events, and 4) Increasing climate variability. These changes are expected to impact human health.

A set of collective **core beliefs** emerged from participants in the two planning sessions; these underlie the group's goals and strategies expressed in the final strategic plan:

1. Actions must be sustainable within each organization's resources and within their community resources.
2. Work must acknowledge the need for environmental justice, recognizing that the most vulnerable populations experience the greatest impacts from environmental and health events.
3. Coordinated efforts on all levels of government, social services and research must occur for any long-term success in managing the effects of climate change on human health.
4. Land, water and air misuse impact human health.
5. By addressing climate change we are protecting human health.

Three plan **goals** followed from these core beliefs:

1. Climate change is recognized as a public health issue & integrated into public health practice. (Currently, climate change and its public health impacts are not understood or appreciated.)
2. Public health agencies will have the tools, resources, and activities to respond to climate change impacts within existing programs. (Public health programs currently deal with many of these health impacts, but lack resources to respond adequately).
3. Vulnerable populations are to be explicitly considered in programs and policies addressing climate change impacts. (Public health systems are not sufficiently prepared to identify and respond to disproportionate impacts on vulnerable populations).

### ***B. Priority climate change - public health issues in Michigan***

During the strategic planning sessions, participants **prioritized public health issues related to climate change** in Michigan according to many factors, including perceived likelihood of occurrence and perceived impact. The collective priorities of all that participated in either or both of the strategic planning sessions were grouped as follows:

#### Priority short-term climate change events:

- 1) Increasing number of heat events with related illness and deaths.
- 2) Declining air quality, as a result of increased production of ozone and particulate matter from heat and drought events.
- 3) Adverse changes to water quality and quantity following severe weather events.

#### Priority long-term public health challenges:

- 1) Rising incidence of infectious diseases and outbreaks of new diseases not currently endemic to Michigan.
- 2) Increasing numbers of disease vectors and appearance of new vectors not currently established in Michigan.
- 3) Degradation of food safety and security and food supply.

#### Response priorities to climate change events:

- 1) Developing responses for emergencies related to extreme weather and/or climate change that are protective of vulnerable populations.

- 2) Ensuring health care services for people with chronic conditions during service disruptions, such as extreme weather events.
- 3) Addressing anxiety, depression or other mental health conditions as consequences of a climate change event.

***C. Proposed Activities (Themes):***

The strategic planning group brainstormed the following proposed activities which were grouped under common themes. These themes and the group goals were used to develop the MI-CHAP plan strategies and objectives.

Theme 1: Connect and educate:

1. Develop media/communication plans and materials for public education; focus on heat, Vector-borne diseases, rural /vulnerable populations, and mental health impacts related to climate change.
2. Reach out and integrate climate change with local activities around sustainability and mitigation to deal with water issues, heat island effects, land use and infrastructure planning, building codes and certifications, promotion of “green” energy, and mass transit.
3. Focus on water policy, laws and regulations; and advocate for changes such as: encouraging water conservation, development of statewide sewerage codes and statewide runoff and gray water standards, improved local beach monitoring and well permitting activities.
4. Support and advocate for expanded monitoring of air quality by DNRE. Improve communication between DNRE and LHDs.
5. Consider the relationship of climate change to food policy in Michigan.

Theme 2: Identify and secure resources:

1. Explore and share information on funding sources for climate change activities.
2. Improve inter-agency discussion, coordination, and communication utilizing partners and working groups.
3. Build public health infrastructure and resources for adaptation response.

Theme 3: Organize, plan and implement a response. (focused on improving emergency planning for Heat Events):

1. Revise heat action levels and improve early warning systems and communications.
2. Incorporate heat events in public health response plans, including establishment of cooling centers, transportation to centers, and provision of air conditioning and emergency power.
3. Conduct surveillance for heat related illness in Michigan.
4. Emergency planning for heat and other events should also address ongoing emergency needs of those who are especially vulnerable due to chronic diseases.

Theme 4: Collect, analyze, and disseminate data

1. Build public health infrastructure and resources for data collection and analysis.
2. Improve disease data/monitoring, surveillance and early detection.
3. Increase capacity for data analysis, update current statistical and meteorological models, and connect environmental and disease outcome data.

4. Develop Health Impact Assessments (HIAs) and other tools.
5. Advocate for more staff and resources for outbreak response, eradication programs, etc.

#### Theme 5: Focus on vulnerable populations

1. Improve methods and response plan to protect vulnerable populations from extreme weather events, heat events, and other climate emergencies.
2. Develop communication strategies for at-risk groups (e.g. reverse 911, communication through churches, etc.), public education and improved early warning systems.
3. Improve planning for response capacity for those with chronic health conditions including transport to cooling centers.
4. Share data on vulnerable populations.

#### ***D. Synthesis***

Three **goals** emerged from the strategic planning meetings, along with nine **priority areas** and five activity **themes** to reach those goals. The MDCH project team used these planning meeting goals and themes to develop our state's strategic plan, with an initial focus on three of the nine priority outcomes: heat events, air quality, and emergency response. Project staff developed objectives and strategies to move the plan forward through the current 2010-2015 economic, scientific and political situation in Michigan. The strategic plan is designed to be augmented with a detailed implementation plan with action items and milestones, developed by the MDCH project team. MI-CHAP will be implemented by MDCH in collaboration with our partners using existing resources, and will be revised periodically as access to information and resources change.

## **V. MI-CHAP: The Michigan Strategic Plan**

### **Goal #1: Climate change will be recognized as a public health issue and integrated into public health practice.**

*These plan objectives were derived from the theme, "Connect and educate":*

***Objective 1.1: State leadership. The Offices of the Directors of MDCH and the Public Health Administration will demonstrate support to the issue of climate change's impact on health.***

#### ***Strategies:***

Senior MDCH management and their staff will be briefed regularly on the relationship of climate change and public health. Educational messages about this issue as well as success stories will be disseminated in the Director's internal MDCH newsletters and will be shared with other state agencies. State legislative activity related to climate change will be monitored, and MDCH will work with MDEQ and other state partners to include health adaptation with the other Michigan Climate Action Plan implementation activities. Policy and program changes that have resulted from this outreach will be tracked.

***Objective 1.2: Training. A training plan and curriculum will be developed and delivered to MDCH staff and to local public health staff. Pre- and post-testing will document improvement in knowledge.***

***Strategies:***

MDCH project staff, the University of Michigan Public Health Training Center and partners will develop a training plan for state and local public health staff. Development includes soliciting input from subject matter experts, identifying and organizing training materials, and creating curricula that can confer continuing education credits. Training announcements and related materials will be posted on the MDCH climate change website and distributed through existing newsletters and partner mechanisms, with trainings available via webinar, online and in-person. Utilization of materials will be tracked and trainings will be evaluated via post-tests and user feedback.

***Objective 1.3: Public education. Strategies for increasing community, public, and policy-maker awareness of public health impacts of climate change will be created, tested and implemented.***

***Strategies:***

MDCH project staff will survey local public health staff on their needs for public educational materials on climate change. Results will be used to identify and organize materials that local health staff can use to communicate climate change issues to the public in their community, both generally and on specific topics such as heat waves or vector-borne diseases. Feedback from LHDs will be used to improve communication strategies and materials.

***Objective 1.4: Partners. Partner organizations will develop and deliver informational sessions for the public and for state and local policy makers on the topic of climate change and health.***

***Strategies:***

MDCH will work with partner organization(s) interested in meeting with state or local legislators and will provide these organizations with informational materials on the health impacts of climate change, with an emphasis on Michigan-specific information. Similarly, MDCH will ask partners to help create effective messages for the public around climate change and health by giving MDCH staff feedback on the materials and best ways to deliver the messages to their constituents. Partner informational sessions will be tracked, along with feedback or other measures of impact.

**Goal #2: Public health agencies will have the resources, tools and activities for responding to climate change impacts integrated /included in their existing programs.**

*These plan objectives were derived from the theme, "Collect, analyze and disseminate data":*

***Objective 2.1: Surveillance, assessment. MDCH will build a data repository for data to be used in statewide environmental health assessments and health surveillance and will conduct surveillance utilizing these data sources.***

***Strategies:***

Surveillance data sources relevant to assessing environmental hazard, health impact and vulnerability for heat and air pollution will be identified and characterized as to their completeness, and whether they can be used to generate statewide and regional health outcome or exposure measures and indicators. For those data systems already in use, MDCH project staff will review and adapt or incorporate relevant parts for inclusion in our surveillance activities. These data will be used by MDCH to conduct surveillance of climate-related health impacts beginning with heat-events, air pollution, and other extreme weather events. These data will be compiled into surveillance reports; the data will also be made available to interested partners.

***Objective 2.2: Assessment, tool development. Health Impact Assessment (HIA) conceptual models will be developed for several topic areas, beginning with heat events and air pollution.***

***Strategies:***

MDCH project staff will review published work and consult with expert partners to identify information needed to assess health impacts of heat events and air pollution, and to determine what information currently in Emergency Response Plans can be adapted for use in these HIAs, including community vulnerability analyses (see Goal 3, below) and adaptive capacity. This information will be used to develop a draft model HIAs for review, revision and ultimate testing by interested LHDs.

*The following plan objectives were derived from the theme, "Organize, plan and implement a response."*

***Objective 2.3: Assessment, adaptation. MDCH and partners will identify state public health programs focused on areas influenced by climate change and create a plan to integrate climate change-related health assessments and adaptation into these activities.***

***Strategies:***

A working group will be organized to coordinate among programs at MDCH and at other state agencies with activities focused on areas that can be impacted by climate change (e.g., communicable disease surveillance, emergency preparedness, chronic disease programs). The working group will create a list of relevant programs and identify activities in those programs that can incorporate aspects of climate change, either through education, assessment or adaptation. Project staff will work with these programs to identify and disseminate adaptation activities and co-benefits that could be coordinated with current activities.

***Objective 2.4. Adaptation, implementation. A database of adaptation strategies and educational materials will be assembled and reviewed.***

***Strategies:***

A review of climate change websites, programs and published literature will be used to generate an annotated bibliography of adaptive strategies, with initial focus on heat- and air pollution –related adaptations. The annotations will include any information on strengths, weaknesses, measures of effectiveness, acceptability, etc. Information will be

compiled into a project database that will be searchable and updated on a regular basis. The database will be made available to all LHDs for use and feedback.

***Objective 2.5: Adaptation. Emergency response plans of MDCH and LHDs will be required to incorporate plans for response to severe climate-change-related weather events likely to impact public health in Michigan***

***Strategies:***

MDCH project staff will work with OPHP and LHDs to reevaluate requirements OPHP places on LHDs for their emergency plans. The requirements will be revised to include components addressing climate-change-related health effects. A second workgroup will evaluate the current MDCH Emergency Operations Plan, including development of a natural disasters Annex. When the Annex is finalized, it will be used as a model for LHDs.

*The following plan objective was derived from the theme, "Identify and secure resources"*

***Objective 2.6: Partners, tools, education. The organization of partners involved in the strategic planning process will continue and be expanded and supported as part of the plan implementation. Implementation tools and activities will be developed from this continued interaction.***

***Strategies:***

MDCH project staff will continue to maintain a partners' e-mail list and pass along project information on a regular basis. A subgroup of interested partners will act as a standing advisory group and will include experts in urban planning, environmental monitoring, emergency preparedness, vulnerable populations, research and advocacy. This group will review progress of the plan implementation. Project staff and interested partners will regularly report on plan progress at state meetings and conferences and in newsletters. At least once a year, all partners will be invited to meet in person or via conference call. MDCH project staff will work through existing structures to keep partners engaged to develop needed tools and assessment models that public health practitioners can utilize. New partners will continue be added as they become identified.

**Goal # 3: Vulnerable populations and their needs will be explicitly considered in programs and policies addressing health impacts associated with climate change.**

*The following plan objectives were derived from the theme, "Focus on vulnerable populations"*

***Objective 3.1: Training. Specific training will be developed on the characteristics of vulnerable populations in Michigan. (Coordinates with Objective 1.2).***

***Strategies***

MDCH project staff will review literature from EPA, CDC and researchers on climate change related health impacts to identify characteristics of populations vulnerable to these health effects, with initial emphasis on heat and air pollution. A training module on vulnerabilities will be incorporated into the climate change training plan for state and local public health

staff. Partners with relevant expertise and programs targeted to these vulnerable populations will be asked input and to review training materials.

***Objective 3.2: Public Education. Health education materials will be compiled and vetted for vulnerable subpopulations. (Coordinates with Objective 1.3).***

***Strategies:***

MDCH project staff will survey LHDs regarding the vulnerable groups in their districts that need targeted educational materials. MDCH project staff will identify and organize materials available from EPA, CDC and elsewhere and provide them to local health staff to be used to communicate climate change issues to vulnerable individuals and groups in their district. Expert partners will be utilized as in Objective 3.1 to provide input and feedback on materials, and modifications will be made as needed. Materials will be designed to be customizable by LHDs.

***Objective 3.3: Tool development. Tools will be developed for vulnerability assessment of a local health district or a community within a district. (Coordinates with Objective 2.2).***

***Strategies:***

MDCH project staff will examine LHDs' current Emergency Planning vulnerability assessments as to their adequacy for identifying community subpopulations with heat-related and air pollution vulnerabilities. Expert partners will be consulted to help identify additional factors that may increase vulnerability to heat morbidity/mortality. Similarly, asthma, chronic disease and air quality experts will be consulted to identify key factors for vulnerabilities and health risks due to air pollution. MDCH project staff will compile and organize data sources from Census, MDNRE, and others that can be used to generate a vulnerability score for each health outcome. Project staff will work with LHDs to review, pilot, and provide feedback. The process will be repeated for other climate related impacts.

***Objective 3.4: Surveillance. Project staff will organize data sources for characterizing the distribution of at-risk populations in Michigan. (Coordinate with Objective 2.1).***

***Strategies:***

Surveillance data sources relevant to assessing vulnerability for heat and air pollution will be identified and characterized as to their suitability in terms of statewide coverage, with and initial focus on heat and air pollution and their health effects. Geographic analyses will be generated and shared with partners to help direct the application of adaptation strategies to high-vulnerability populations in the state.

## **VI. Summary and conclusions**

This strategic plan, when implemented, will empower the public health system to address climate change issues and protect public health in our state. Many people and organizations contributed to this effort and their continued support and involvement is critical to the plan's implementation and long-term sustainability. The MDCH Project Team gratefully acknowledge their efforts and look forward to a continuing partnership as we together begin implementing the Michigan Climate and Health Adaptation Plan.