CLIMATE AND HEALTH ADAPTATION PLANNING GUIDE FOR MICHIGAN COMMUNITIES

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MICHIGAN STATE UNIVERSITY SCHOOL OF PLANNING, DESIGN AND CONSTRUCTION AND MICHIGAN STATE UNIVERSITY EXTENSION

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Marquette County, Michigan, including the Marquette County Health Department, the Marquette County Climate Adaptation Task Force (CATF), Superior Watershed Partnership (SWP), and numerous community stakeholder groups all held vital roles in the MICHAP and MSU pilot project to address Marquette area climate and health impacts. This community project formed the basis for this more widely applicable guidebook.

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EXECUTIVE SUMMARY

The climate is changing in the Great Lakes Region. The average temperature, the frost-free season, total precipitation, and the number of heavy precipitation events all increased from 1951–2017, according to the most recent data available. Around the world, public health agencies have identified climate change as one of the greatest threats to human health. Many communities in Michigan are already experiencing negative consequences on health with the more vulnerable people and places being impacted first and more severely. The impacts occur unequally because climate change multiplies risk factors such as racial inequity, environmental injustice, economic disparities, access to health care, and aging infrastructure. Future climate-related health impacts can be prevented by mitigating climate change itself through greenhouse gas reduction. However, state and local governments and health departments must also develop climate adaptation strategies to reduce, eliminate or prepare for those health impacts already occurring.

This guide is intended to help communities in Michigan and across the Great Lakes Region develop a climate and health adaptation plan or to integrate climate and health concepts into existing initiatives. A climate and health adaptation plan is defined here as a strategy document that fosters collaboration across disciplines and interest groups to instigate a series of activities toward the common objectives of understanding and then preventing or reducing the anticipated health impacts of climate change in the area.

Communities are unique in their makeup, systems, and needs, which makes planning for climate and health adaptation complex. This guide was developed to be accessible and flexible for the unique situations of urban, suburban, and rural communities. With that in mind, a set of core principles establishes a foundation from which each community can build. Those include: 1. Centering on health and equity; 2. Engaging diverse partners reflective of the community, especially vulnerable and marginalized populations, along with technical stakeholders and decision makers; 3. Incorporating locally relevant climate and health data in decision making; and 4. Establishing a shared vision for what successful climate adaptation means to the community. A clear understanding of the impacts on all sectors and subgroups is required in order to prepare for and respond to climate-related health impacts in an equitable manner. Working across sectors to build adaptive capacity is crucial for taking meaningful actions.

This guide utilizes four planning phases: 1. Engage stakeholders and identify concerns; 2. Engage community and develop the plan; 3. Prioritize and implement; and 4. Monitor, update, and keep active. There is also an extensive section on developing visual aids to create buy-in and establish the community's vision for adaptation in a local context. Within each phase there are detailed sub-steps with checklists and resources that can be used to facilitate and document progress.

Throughout the guide there are case studies and examples from the pilot of this process in Marquette, Michigan. These are included to stimulate ideas relevant to your locale and to illustrate the effectiveness of this approach. The Appendices have templates for conducting community visioning meetings and a curated list of guidance documents, and there is an extensive list of other references with hyperlinks.

We hope this Guide provides readers with the knowledge and tools they can use to build healthier, more resilient communities.

DEFINITIONS

Adaptive Capacity: The expertise, plans, programs, or resources a community has in place to prevent or reduce negative impacts (Manangan et al., 2014)

Built Environment: All of the physical parts of the spaces where we live and work (e.g., homes, buildings, streets, open spaces, and infrastructure) (CDC, 2011)

Climate and Health Adaptation Plan: A strategy document that fosters collaboration across disciplines and interest groups to instigate a series of activities toward the common objectives of understanding and then preventing or reducing the anticipated impacts of climate change in the area (Marinucci et al., 2014)

Climate Adaptation: Actions taken at the individual, local, regional, and national levels to reduce risks from climate conditions and prepare for projected future climate changes (Lempert et al., 2018)

Climate and Health Adaptation: Steps taken to protect people and communities from the health risks associated with a changing climate (American Public Health Association, 2015)

Climate Change: Changes in average weather conditions—such as temperature, precipitation, and risk of extreme events—that persist over multiple decades or longer (Jay et al., 2018)

Climate Change Mitigation: Efforts to reduce or prevent the emission of greenhouse gases (UN Environment, n.d.)

Climate-Health Pathway: A description of how climate change directly and indirectly impacts human health (Cameron et al., 2015)

Community Sectors (aka Sectors): Various groups that people in the larger community might be divided into for reasons of common social, political, economic, cultural, or religious interests (Center for Community Health and Development, 2018a)

Exposure: The severity, frequency, and types of changes to an area's climate (Manangan et al., 2014)

Green Infrastructure: The use of vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water and create healthier urban environments (United States Environmental Protection Agency, n.d.)

Resilience: The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption (USGCRP, 2016)

Rural: As a "non-metro" county, a rural county includes some combination of: open countryside, rural towns (places with fewer than 2,500 people), and urban areas with populations ranging from 2,500 to 49,999 that are not part of larger labor market areas (metropolitan areas) (USDA ERS, 2019)

Stakeholder: Anyone with an interest in a particular decision. This interest can stem from the potential to influence the decision, and/or from the potential to be influenced by the decision. Stakeholders can act as individuals or as representatives of a larger group (Garder et al., 2009)

Vector: Mosquitoes, ticks, and fleas that spread pathogens. A person who gets bitten by a vector and gets sick has a vector-borne disease (CDC, Division of Vector-Borne Diseases, n.d.)

Visualization: Before-and-after images and other visual aids used to help stakeholders and the general public understand the connection between climate, health, and what adaptation might look like in their community

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt (Intergovernmental Panel on Climate Change, n.d.). Climate Vulnerability is a function of the character, magnitude, and rate of climate variations to which a system is exposed, its sensitivity, and its adaptive capacity (Manangan et al., 2014)

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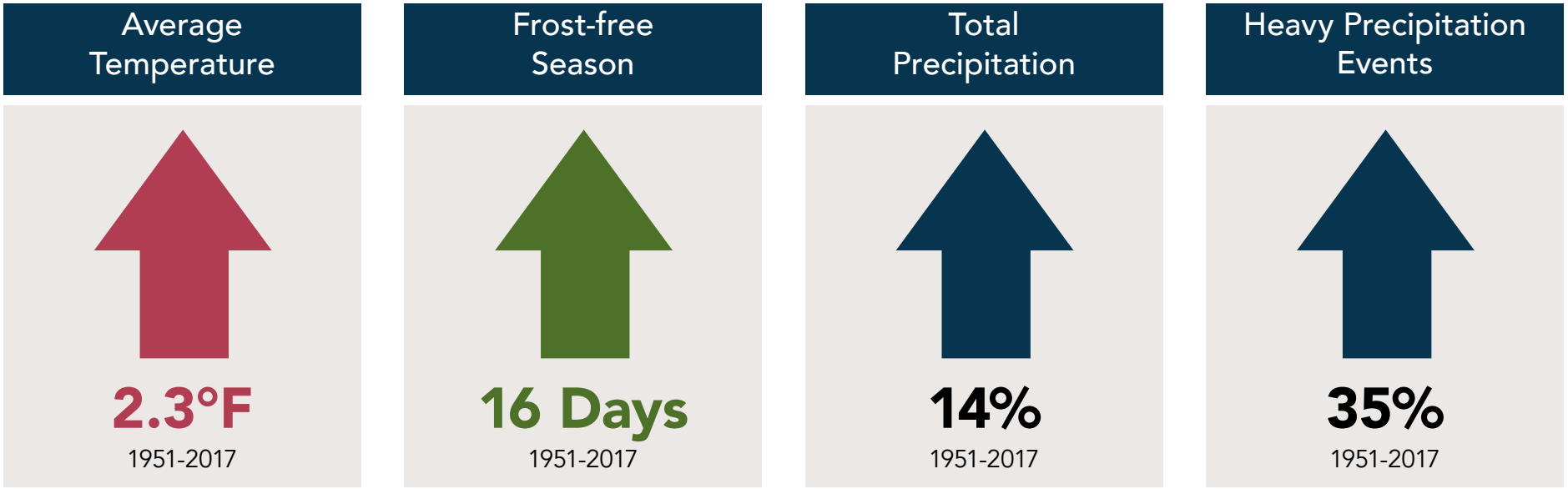
INTRODUCTION

The climate is changing in the Great Lakes Region (Great Lakes Integrated Sciences and Assessments [GLISA], n.d.). The average temperature, the frost-free season, total precipitation, and the number of heavy precipitation events all increased from 1951–2017, according to the most recent data available (Figure 1). Weather and climate have a variety of significant impacts on human health. For example, heavy rain events can lead to flooding, heat waves can lead to illness and death, and frost-free seasons influence pollen-producing plants and disease-carrying insect habitats (Centers for Disease Control and Prevention [CDC], 2014). Furthermore, climate change is a risk multiplier, meaning that changing seasonal patterns and more frequent and intense heat and precipitation events related to climate change can exacerbate the environmental, social, and economic stressors communities already face, while also presenting new threats in new areas (U.S. Global Change Research Program [USGCRP], 2016).
The importance of planning now for the health impacts of climate change in our communities is clear.

Figure 1: *Climate change in the Great Lakes Region. (Adapted from figure in GLISA, 2019).*



Although many communities recognize the impacts and the need to respond, many are restricted by actual or perceived limitations in funds, staff time, technical expertise, and coordination between necessary partners or stakeholders (Maibach et al., 2008). An additional limitation, particularly for rural communities, is a lack of relevant evidence-based guidance related to climate planning and implementing practical solutions.

Recognizing the importance of adapting to the changing climate and the challenges Michigan communities face in doing so, the MDHHS Climate and Health Adaptation Program (MICHAP) has partnered with Michigan State University (MSU) School of Planning, Design and Construction (SPDC) and Michigan State University Extension (MSUE) to develop this guide as a resource for Michigan communities that wish to undertake climate and health adaptation planning. Though any community can utilize this guide, it is developed with the recognition that climate guidance is often focused on more urban communities and that smaller and more rural communities need resources that are adaptable to their unique challenges and opportunities as well.

WHY USE THIS GUIDEBOOK?

While climate change is recognized as one of the greatest threats to public health, few models of climate and health planning currently exist, particularly for small and more rural communities. For those communities that are proactively building climate adaptation capacity, there is limited guidance available on how to incorporate health perspectives; coordinate local governments, planners, health departments, and other partners; and engage vulnerable populations. This guide builds upon the experience gained and lessons learned by MICHAP, MSU SPDC, and MSUE from a pilot project in Marquette County, Michigan, which resulted in the creation of the three-volume Marquette Area Climate and Health Adaptation Guidebook (https://www.canr.msu.edu/climatehealthguide). This guidebook demonstrates how even small communities can approach the unique challenges of climate and health adaptation planning.

CLIMATE AND HEALTH ADAPTATION PLANNING BACKGROUND

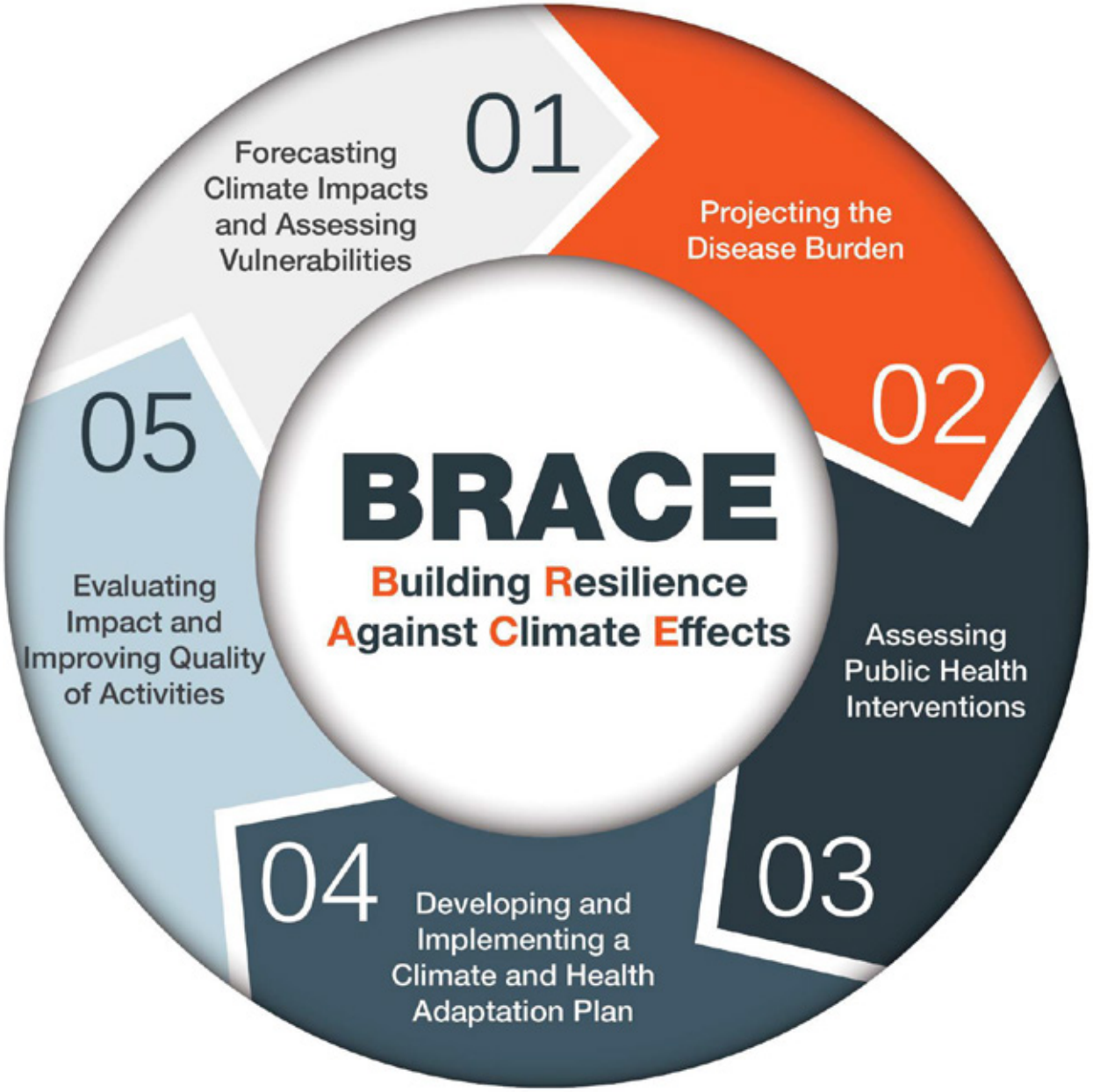
The CDC's Climate and Health Program developed the Building Resilience Against Climate Effects (BRACE) framework to guide health departments and communities in preparing for the health effects of climate change. The Program has provided funding for MICHAP and other state and city health departments to implement BRACE since 2010. BRACE follows five steps for building resilience (Figure 2). The steps of the BRACE framework inform the four phases of this guide.

MICHAP'S BRACE PILOT PROJECT IN MARQUETTE COUNTY

As a part of the CDC's Climate-Ready State and Cities Initiative, MICHAP uses the BRACE framework to build public health resilience to climate impacts in Michigan. MICHAP noted that rural communities, in particular, needed to build their capacity to address climate-related health impacts. In response to this finding, they partnered with MSU SPDC and MSUE to develop a pilot program for climate and health adaptation planning in rural Michigan communities. In 2017, the team initiated a three-year pilot of a climate and health adaptation project in the largest rural county in Michigan, Marquette County. The project brought together stakeholders from across 1,873 square miles of land representing close to thirty local units of government, agencies, and organizations to address climate and health adaptation. This project is novel because it uses visualizations as a central part of communication. The visualizations include posters, maps, and other displays that improve engagement by illustrating how climate change can harm public health and how adapting spaces and the built environment can improve health, increase usability, and promote resilience for everyone.

The process used for the pilot project is the basis for this guide. Through inclusive and frequent stakeholder and community engagement, detailed and informative before-and-after visualizations, and evidence-based recommendations, the steps laid out here provide a framework for community-wide action. The guide uses Marquette County as a case study to provide examples, with the understanding that each community is unique and will modify the approach as appropriate for them.

Figure 2: *CDC's Building Resilience Against Climate Effects (BRACE) Framework. (CDC, 2018).*



PLANNING FOR CLIMATE AND HEALTH OVERVIEW

WHAT IS A CLIMATE AND HEALTH ADAPTATION PLAN?

A climate and health adaptation plan is a strategy document that fosters collaboration across disciplines and interest groups to instigate a series of activities toward the common objectives of understanding and then preventing or reducing the anticipated impacts of climate change in the area. Moreover, it builds a community's adaptive capacity to address the impacts of climate change on public health by engaging stakeholders in the process of outlining climate-related health risks, connecting with vulnerable people and places, and building consensus around opportunities for responding. By focusing on actions that address community-identified concerns and describing locally relevant metrics that can be used to measure impacts, a climate and health adaptation plan will guide a community's efforts to adapt to climate change.

WHY IS A CLIMATE AND HEALTH ADAPTATION PLAN IMPORTANT?

Climate change can impact the health of everyone. Often it impacts certain vulnerable populations first and hardest. A climate and health adaptation plan explicitly incorporates those health and vulnerability factors. It guides stakeholders and community leaders to consider those concerns when developing new policies, directing funding, starting projects, and building overall adaptive capacity.

THE CLIMATE AND HEALTH CONNECTION

Climate change is occurring in Michigan and has serious consequences for human health. The changes in overall climate conditions are leading to shifting seasonal patterns and more extreme weather events. These changes include more frequent and extended periods of high heat and humidity, flooding, and droughts caused by changing precipitation patterns, extreme weather such as heavy snow and freezing rain, and ecosystem changes that expand ranges for disease-carrying pests and pollen-

CLIMATE ADAPTATION VS. CLIMATE MITIGATION

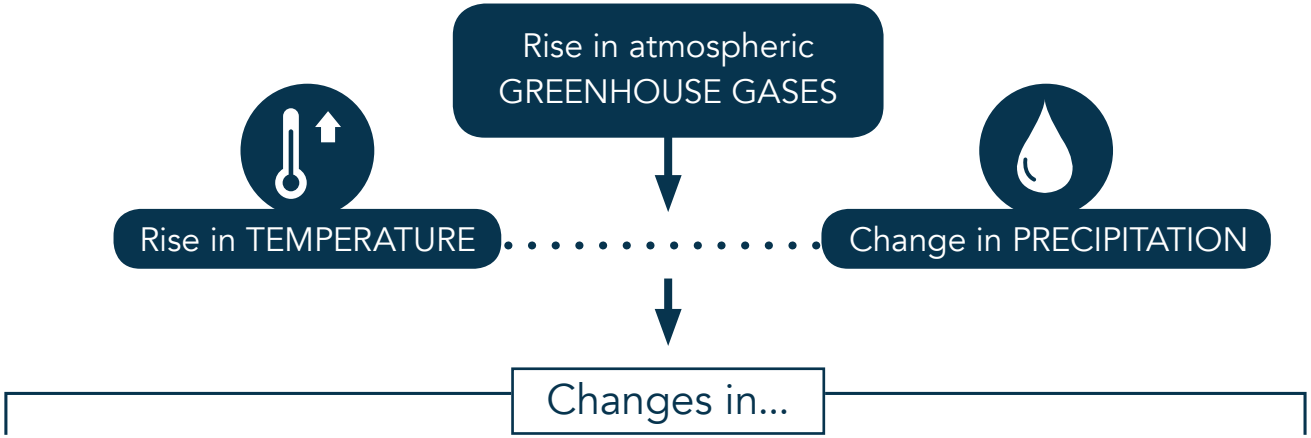
Climate adaptation addresses the impacts of climate change by recognizing that the climate is already changing which is leading to health-related and other impacts. Public officials can coordinate effective responses to these impacts through Climate Adaptation Plans. Conversely, *climate mitigation* is the process of reducing or eliminating the cause of climate change, greenhouse gas emissions. Climate Mitigation (or Action) Plans often lay out renewable energy and energy efficiency strategies to reduce emissions in sectors such as buildings, transportation, and utilities. Though the focus of this guide is on climate adaptation protective of health, both adaptation and mitigation strategies should be developed together to promote greater overall resilience.

MEETING COMMUNITY GOALS THROUGH ADAPTATION PLANNING

Developing a climate and health adaptation plan can help meet other community goals, including Michigan State Drinking Water Act compliance and Federal Emergency Management Agency disaster relief funding requirements. For more information about how local tools fall within the state and federal policy framework, see Appendix A.

producing vegetation. These direct and indirect climate impacts can exacerbate current health problems, as well as create new health threats for all Michiganders. Figure 3 shows how changes in climate lead to health effects.

Figure 3: *Changes in our atmosphere lead to health effects (Figure adapted from Minnesota Department of Health, 2016).*



AIR QUALITY

Exposure Pathway
- Wildfire smoke
- Particulates
- Longer pollen season
- Ozone and smog

Health Outcomes
- New and worsening existing respiratory illness
- Allergic diseases
- Mental stress

EXTREME WEATHER EVENTS

Exposure Pathway
- Heat waves
- Extreme cold
- Storms

Health Outcomes
- Heat illness and death
- Cold-related injuries
- Worsening existing cardio-respiratory illnesses
- Mental stress

WATER QUALITY AND QUANTITY

Exposure Pathway
- Drought
- Flood
- Harmful algal blooms

Health Outcomes
- Waterborne diseases
- Worsening existing respiratory illness
- Mental stress

ECOSYSTEM CHANGES

Exposure Pathway
- More animal hosts
- More ticks & mosquitoes
- Longer vector season

Health Outcomes
- Lyme disease
- West Nile Virus
- Other tick- and mosquito-borne diseases

MICHAP has identified five climate-related health outcomes of most concern: respiratory diseases, heat-related illnesses, waterborne diseases, vector-borne diseases, and injuries, specifically carbon monoxide (CO) poisoning (Cameron et al., 2015).

1. **Respiratory Diseases:** Under a business-as-usual scenario, projected conditions indicate increased air pollution and worsening respiratory disease. Climate projections also forecast earlier and longer growth periods for plants. This translates to increased pollen levels, which could worsen allergies and exacerbate symptoms and respiratory conditions, including asthma.

2. **Heat Illness:** Air mass stagnation events may increase in frequency if high humidity occurs with high temperature and low winds, leading to increased heat stress-related morbidity and mortality. The numbers of high heat days are projected to increase by mid-century. As a result, there will likely be large, direct impacts on human health, especially if occurring simultaneously with other variables, such as the urban heat island effect.

3. **Waterborne Diseases:** Climate conditions leading to flooding are projected to worsen in the future. This increases the risk of waterborne diseases in areas vulnerable to sewage/septic failures and runoff. In certain areas, it will also increase the risk of the development of harmful algal blooms.

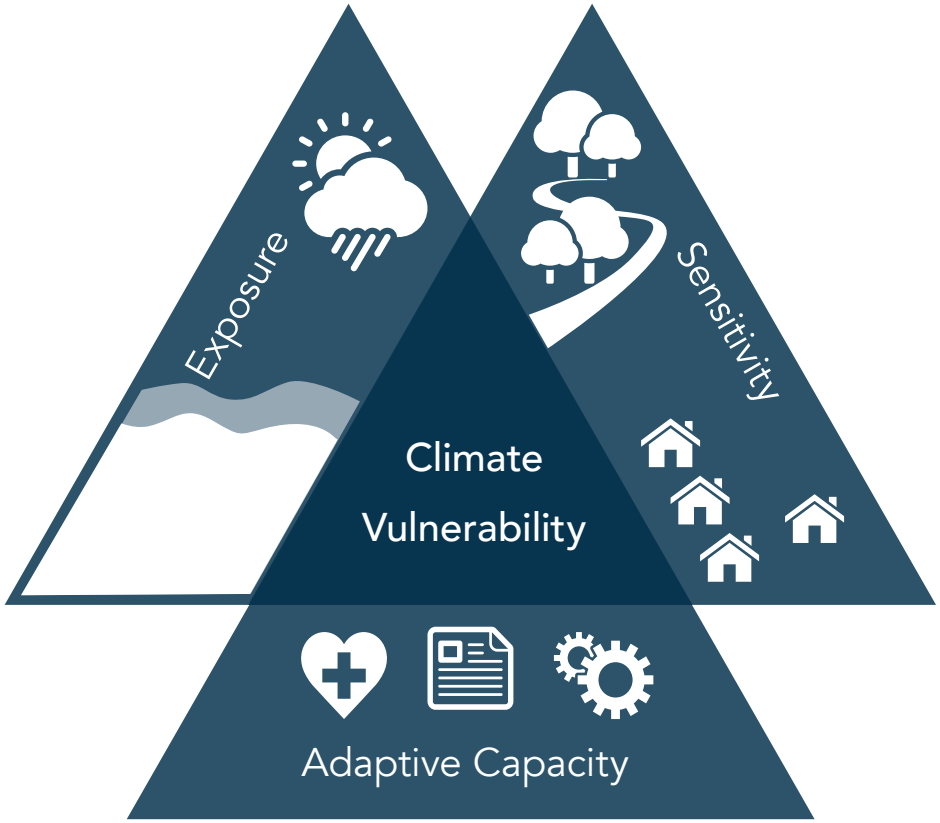
4. **Vector-borne Diseases:** Projections point to warmer winters, earlier springs, and warmer summers, conditions suitable for mosquitos carrying West Nile Virus and other serious diseases. Similarly, current and future conditions are suitable for Lyme disease and its tick vector, although there is greater difficulty in projecting the burden given the complex sequence of climate conditions and the tick's life cycle needs.

5. **Injury and CO Poisoning:** Extreme weather events conducive to power outages are projected to increase, especially in winter. This will lead to increased use of generators and thus an increased risk of CO poisoning. Power washers used during cleanup following an extreme weather event may also increase the risk of CO poisoning. Freezing rain and flooding increases will raise traumatic injury risk.

VULNERABILITY TO CLIMATE CHANGE

Climate vulnerability is a measure of a community's risk of being negatively impacted by climate change, its ability to prepare for those impacts, and its ability to respond when events occur. The Third National Climate Assessment describes **vulnerability** as "a function of the character, magnitude, and rate of climate variations to which a system is exposed, its sensitivity, and its adaptive capacity" (IPCC, 2012). Figure 5 illustrates the three variables included in a vulnerability assessment and how they relate. In the context of climate and health adaptation, **exposure** is the severity, frequency, and types of changes to an area's climate. Exposure includes changes to average temperature and precipitation, shifting seasonal patterns, and extreme events such as high heat, heavy rain, and drought. **Sensitivity** characterizes the population and their health and living conditions. Variables to consider when determining the sensitivity of a community include but are not limited to personal characteristics such as age, gender, pre-existing conditions, or taking certain medications; infrastructure such as transportation, housing, or energy; and overall population attributes such as social or geographic isolation, low income, or discrimination. **Adaptive capacity** is the expertise, plans, programs, or resources a community has in place to prevent or reduce negative impacts (Manangan et al., 2014).

Figure 4: *Components of vulnerability (Figure adapted from Fig. 14 in Trundle & McEvoy, 2015).*



EXPOSURE

- Area impacted by climate hazard(s)
- Severity of climate hazard(s)
- Frequency of climate hazards

ADAPTIVE CAPACITY

- Mobilizable response resources
- Information, skills & communication
- Institutional and social capital

SENSITIVITY

- Household & community characteristics
- Quality of housing & other physical systems
- Functionality of, access to services & utilities

GUIDING PRINCIPLES OF A CLIMATE AND HEALTH ADAPTATION PLAN

There are four guiding principles to keep in mind when developing a climate and health adaptation plan (Adapted from Alameda County, California Office of Sustainability, 2018; Frumkin et al., 2008; Rudolph et al., 2018). These principles can help to ensure the plan successfully engages residents and community leaders in comprehensively addressing the climate and health concerns of the community.

Keep health and equity at the forefront of all action

As climate change and health inequities are "inextricably interconnected," there is opportunity for addressing both with one set of actions (Rudolf et al., 2018). Centering the process on health and equity starts with involving community members from all racial, economic, and technical groups in organizing, planning, and resource allocation. There should be safe, open, and honest discussions around current and historic systems and processes that contribute to injustices and climate vulnerabilities. As the plan is developed and the process moves forward, continue monitoring who is missing from the discussion, who is benefiting from the project and what the benefits are, and how each decision is meeting the community's needs in an equitable manner.

Engage decision makers and representative community members throughout the process

Early and continuing community buy-in is essential for implementing the plan. Buy-in requires building relationships with and gathering perspectives from decision makers as well as representatives from diverse populations and community groups throughout the process. In keeping with the first principle, extra effort should be made to include vulnerable and marginalized populations throughout the process. Consider finding times and locations that are accessible to different groups, compensating community members for their knowledge and expertise, providing childcare during the meetings, and planning for transportation. Be sure to show in the plan how community feedback has been recorded and incorporated. Clearly showing how public input shaped the plan is essential to long-term support and implementation.

Use locally relevant climate data and vulnerability assessments

Before developing a climate and health adaptation plan, it is important to understand how the climate has already changed in the area, how it is projected to change in the future, and where the community's vulnerabilities exist. Conducting a climate vulnerability assessment can provide these valuable insights, but complex data sets and technical capacity can be barriers. Fortunately, datasets and interactive tools exist (see Appendix A) that can provide guidance and reduce those barriers. In addition, talking with community members about their observations, experiences, and climate-related concerns provides valuable 'ground truthing' of local impacts and priorities and enhances the plan's relevance and acceptability.

Leverage visualizations tools to establish shared vision

Sometimes words like "adaptation" and "climate change" bring up resistance within a community. Even for supportive community members, envisioning an "adapted" environment can be difficult and deter some from participating in the planning process. Visualizations are effective in conveying how adaptation looks in the community and help to explain the pathways which connect climate and health. Imaging of the community, of areas before and after adaptation installations, examples of interventions from other communities, and geographic information system (GIS) mapping are examples of visualizations that aid in the education component of the planning process. Leverage all available tools and resources to help illustrate the idea of climate and health adaptation within the community. It may be helpful to work with university partners or local nonprofits with graphics skills. See p. 43 for information about visualizations.

STEPS FOR CREATING A CLIMATE AND HEALTH ADAPTATION PLAN

Each community will complete a climate and health adaptation plan at a different pace. The timeline depends on the level of community engagement, staff capacity, availability of information and resources, and other factors. Regardless of the pace, effective climate and health adaptation planning includes four phases, with each phase consisting of multiple steps. The purpose of this phased approach is to ensure the plan is relevant to the entire community. The four phases and steps described in this guide and shown in Figure 6 are derived from the Marquette Area Climate and Health Adaptation pilot project. Although appropriate for Marquette County and applicable to other communities, these methods may be customized based on a particular community's needs

Phase 1 involves engaging key community stakeholders and identifying the community's climate and health priorities. In Phase 2, the project team will work with community members in developing actionable recommendations and overall strategies for addressing these priorities. Phase 3 will entail prioritizing specific objectives and taking action to achieve them. During Phase 4, the implementation and outcome of these recommendations will be monitored, and the actions and strategies laid out in the plan will be updated as necessary.

Figure 5: *Steps for Creating a Climate and Health Adaptation Plan*

PHASE ONE

Engage Stakeholders and Identify Concerns

1.1 Establish Project Leadership

1.2 Establish Steering Committee

1.3 Identify Climate Trends, Vulnerable Populations, and Stakeholders

1.4 Engage Stakeholders and Identify Concerns

1.5 Identify Stakeholder Priorities

PHASE TWO

Engage the Community and Develop the Plan

2.1 Meeting One: Community Visioning

2.2 Identify Potential Adaptations and Metrics and Develop Visualizations

2.3 Obtain Feedback

2.4 Finalize the Plan Using Recommendations and Visualizations

PHASE THREE

Prioritize and Implement

3.1 Host an Implementation Prioritization Workshop

3.2 Develop a Strategy for Implementing the Climate and Health Adaptation Plan

3.3 Implement the Community's Climate and Health Adaptation Plan

PHASE FOUR

Monitor, Update, and Keep Active

CLIMATE AND HEALTH ADAPTATION PLANNING PHASES

This section provides a detailed description of readiness assessment and the four phases of climate and health adaptation planning. Each step includes a checklist of critical activities completed during that step.

BEFORE YOU BEGIN: ASSESS CAPACITY AND READINESS FOR ADAPTATION PLANNING

Climate and health adaptation planning is a complex process, one that takes time and dedication (Marinucci et al., 2014). A certain level of community readiness is necessary for successful planning and for the implementation of the resulting recommendations. How ready is the community to act? Understanding where the community is on the continuum of readiness can help shape the planning process and the approaches the community chooses in adaptation planning.

Community readiness for climate and health adaptation planning can range from zero awareness of or outright hostility toward climate change-related topics to a high level of community ownership surrounding adaptation and mitigation (Center for Community Health and Development, 2018b). Awareness, time, collective values, and resources—among other characteristics—factor into a community's readiness. Communities that have undertaken some climate action or adaptation planning or that have conducted community health assessments and developed responses may have already laid a foundation for approaching climate and health adaptation planning. For example, a community with a history of climate action or resilience planning may have established a core group of leaders or a taskforce dedicated to moving climate adaptation forward in the community. That capacity is an asset that can be shifted toward climate and health adaptation planning.

Assessing community readiness requires connecting across disciplines, cultures, and perspectives to take stock of attitudes toward climate change, knowledge of its connection to health, and learning about existing climate adaptation or sustainability initiatives (Center for Community Health and Development, 2018b). As such, being able to communicate effectively across diverse stakeholder groups and understand their roles is essential. The CDC Climate and Health Program has developed A Guide for Cross-Sector Collaboration to provide "insights and pointers for collaboration opportunities in 10 sectors" (CDC, 2019b). This guide can serve as a practical starting point for those looking to start the climate and health adaptation planning process.

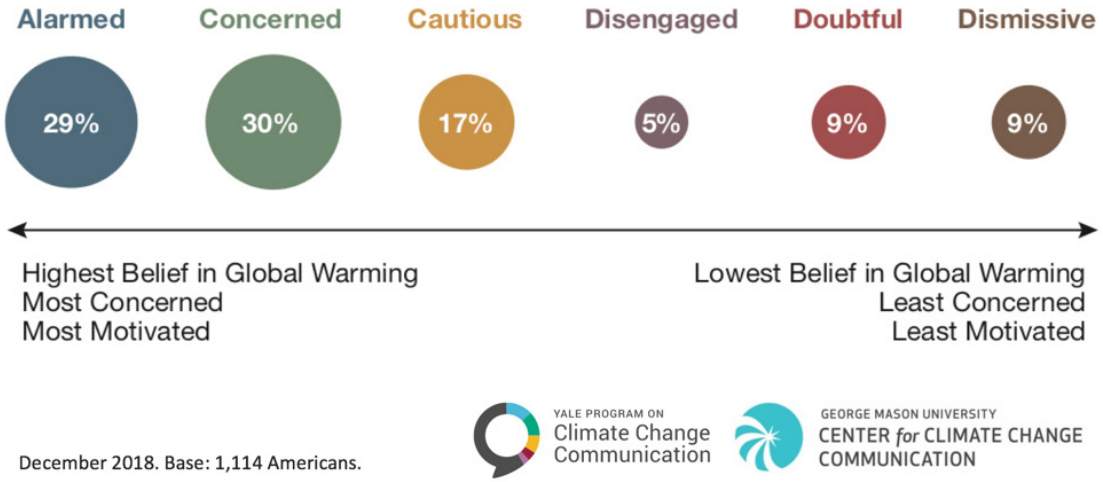
Existing climate adaptive capacity can act as an indicator of community readiness.

Existing adaptive capacity can act as an indicator of community readiness. What actions have previously been taken to prepare for the negative health impacts of climate change? What resources does the community have for undertaking adaptation actions? Are there opportunities to build adaptation into existing plans for

CASE STUDY

In Marquette County, existing adaptive capacity was a strong indicator of community readiness to take on the Marquette Area Climate and Health Adaptation pilot project. Marquette is unique compared to other communities of its size, and even those much larger, in terms of the number and sophistication of climate adaptation activities already underway and the variety of stakeholders participating. Climate plans have been created and are being implemented for the Lake Superior Watershed (Superior Watershed Partnership, 2012), Marquette County (Superior Watershed Partnership, 2013), and the City of Marquette (MSUE & MSU SPDC, 2013). Groups such as the Marquette County Climate Adaptation Task Force (CATF) and the Superior Watershed Partnership & Land Trust (SWP) have been instrumental in laying the foundation of climate change awareness and understanding while also building a broad network. Assessments of the environment and infrastructure had been completed, and local experts identified. This allowed the climate and adaptation plan to focus on building relationships with vulnerable populations, explore connections between the climate, health, and the built environment, and find ways to incorporate climate and health recommendations into existing initiatives.

Figure 6: *2018 "Six Americas" Survey Results. (Yale Program on Climate and Communication, 2016).*



projects such as existing community health assessment and response processes? Who should be involved, and at what levels? Is there an organization that will coordinate or own the implementation of recommendations? Appendix A provides tools such as the CDC's Climate and Health: *Planning Worksheet – Preparing a Coordinated Community Response* and the Minnesota Sea Grant's *A Self-Assessment to Address Climate Change Readiness in your Community* that can be helpful in answering these questions and bringing stakeholders together to assess readiness across sectors such as public health, infrastructure, facilities, natural resource management, tourism, community planning, and others.

A simple framework of understanding community attitudes known as "Global Warming's Six Americas" was presented by the Yale Program on Climate Change Communication. "Six Americas" segments the population into six audiences based on their climate change beliefs, attitudes, and behaviors. The audiences range from "alarmed," those who are convinced of the seriousness of global warming and believe in immediate policy action as a solution, to "dismissive," those who do not believe global warming is a real problem and oppose related policies. The survey has been conducted annually since 2009 and has since seen a dramatic rise in the number of Americans who are either "alarmed" or "concerned" about global warming. Figure 6 shows the breakdown of the audience segments, with 29% of Americans alarmed, 30% concerned, 17% cautious, 5% disengaged, 9% doubtful, and 9% dismissive.

KNOW YOUR AUDIENCE

Every community is comprised of residents with different beliefs, values, and priorities. Understanding the distribution of community attitudes toward climate and health adaptation planning and climate change in general can be important in getting the community on board. For example, a 2019 study found that 61% of registered voters are worried about global warming, and 58% support local government action to address global warming (Leiserowitz et al., 2019).

Figure 7: *Estimated percentage of adults who are worried about global warming in Michigan. (Yale Program on Climate and Communication, 2018).*

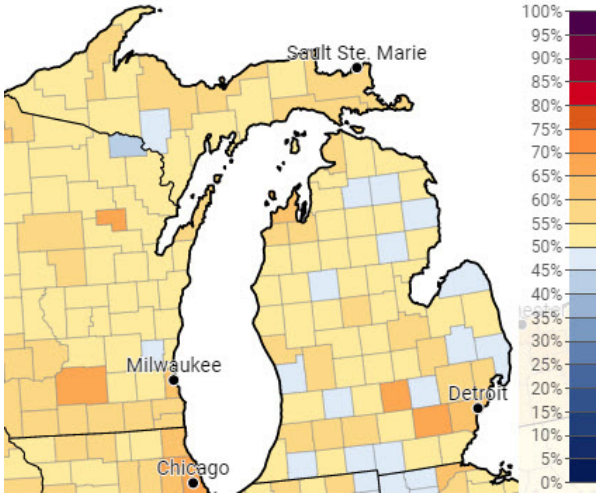


Figure 7 depicts the 2018 survey results for Michigan indicating the percentage of adults concerned about global warming by county and gives a sense of overall attitudes. In Michigan, based on the 2018

data, the percentage of adults concerned about global warming ranges from 45 to 70 by county. While the "Six Americas" is a general overview and starting place, gathering local data on attitudes of residents and community leaders may be informative and useful to individual communities.

Pre-Planning Checklist:

☐ Create an initial list of key disciplines and functional areas of the community to engage.

☐ Assess community capacity and readiness for climate and health adaptation planning.

Suggested Tools:

- Climate and Health: Planning Worksheet – Preparing a Coordinated Community Response (https://www.cdc.gov/climateandhealth/pubs/CDC_PlanningWorksheet-508.pdf)
- A Self-Assessment to Address Climate Change Readiness in Your Community (https://glslcities.org/library/a-self-assessment-to-address-climate-change-readiness-in-your-community/)

PHASE 1: ENGAGE STAKEHOLDERS AND IDENTIFY CONCERNS

The first phase of climate and health adaptation planning is about building relationships, beginning to educate stakeholders about climate and health issues, and gathering concerns or solutions from their perspective. Ensure participants are representative of the community to increase the likelihood of a relevant plan that will have social, political, and financial support. This phase includes five steps.

PHASE 1 GOALS:

- Establish plan leadership and a steering committee.
- Identify climate trends, key stakeholders, vulnerable populations, and community partners.
- Engage key stakeholders and identify priority climate and health concerns.

PHASE 1 EXPECTED OUTCOME: Plan leadership is established, key stakeholders are engaged, and priority climate and health concerns are identified.

PHASE 1 RESOURCES NEEDED:

- Significant time input from plan leadership
- Commitment by steering committee members
- Local climate data

STEP 1.1: ESTABLISH PROJECT LEADERSHIP

Who will be organizing this initiative? Are they from inside or outside of the community? What skill sets do they bring? What resources do they have access to that could benefit the planning project? Do vulnerable and marginalized groups have an equal leadership role? Establishing a designated lead person or team of people can help ensure that the planning project continues to move forward. Leaders might include a local or county planning department, a local health department, a climate- or health-related local organization, an institution such as a university, or other community-invested firms or agencies. At this time, the project team structure should also be addressed, identifying who will be coordinating project activities and who will be responsible for completing deliverables leading up to and culminating in the climate and health adaptation plan. The project team may include those involved with the project leadership, but there may be additional skills or capacity needed. Once selected, the project leadership can draft a project scope, timeframe, and major project benchmarks to guide plan development.

Step 1.1 Checklist:

- ☐ Identify an individual or team to lead the project.
- ☐ Select the project team.
- ☐ Draft a project scope, timeframe, and major project benchmarks.

STEP 1.2: ESTABLISH STEERING COMMITTEE

A steering committee can help determine the structure of the planning process, ensure a dedicated group exists to provide feedback, and facilitate buy-in from key individuals and organizations. Membership of a steering committee should reflect the community's sectors (Center for Community Health and Development, 2018a), including vulnerable and marginalized groups. Consider including people familiar with climate change, public health, sustainability, community planning, critical needs and social services, and other related topics. Public officials, residents, businesses, academics, non-profits, and other local organizations should be represented on the committee. The broader the representation, the higher the likelihood that the process and input will be a true reflection of community needs. This group is also likely to be influential in ensuring local ownership of the results and recommendations of the planning project. Refer to the CDC Climate and Health Program's A Guide for Cross-Sector Collaboration for additional "insights and pointers for collaboration opportunities in 10 sectors" related to climate and health adaptation (CDC, 2019b).

In some cases, the steering committee may consist of an existing task force dedicated to climate adaptation for the region. In other cases, the plan development process might spur the creation of one.

WHO IS YOUR PLAN CHAMPION?

Climate and health adaptation planning is a people-driven process. Plan champions are community members or public officials passionate about and dedicated to moving a plan forward in a community. They are vital to a successful planning process and implementation of a plan. A plan champion's role includes making sure plan leadership meets regularly and holding team members accountable for getting their tasks done. Capitalizing on their energy early on can help the plan gain momentum from the outset.

CASE STUDY

In the Marquette County pilot project, plan leaders at MICHAP and MSU helped organize and structure the planning process. Local plan champions, including a Marquette County Health Department Officer, the Climate Adaptation Task Force Chair, and the local MSU Extension Educator, kept local momentum alive throughout the planning process.

The project leadership should work with a newly formed steering committee to review and modify, if necessary, the project scope, timeline, and goals based on their unique insights. At this stage, the group should also

jointly develop a communication plan and an evaluation plan. The communication plan will be beneficial in guiding outreach and engagement to additional stakeholders in step 1.3 and beyond. The evaluation plan will help define the types of data needed, the process for data collection throughout the plan development and implementation process, how the data will be used, the metrics that are needed, and how the results will inform the process and stakeholders involved. Appendix A provides links to resources on both communication and evaluation planning if additional guidance is needed in those areas.

Step 1.2 Checklist:

- ☐ Establish a steering committee representative of the community.
- ☐ Review the scope, timeline, and goals.
- ☐ Develop a communication plan.
- ☐ Develop an evaluation plan.

Suggested Tools:

- University of Kansas Center for Community Health and Development Community Tool Box: Developing a Plan for Communication (https://ctb.ku.edu/en/table-of-contents/participation/promoting-interest/communication-plan/main)
- CDC Program Performance and Evaluation Office (https://www.cdc.gov/eval/index.htm)

CASE STUDY

In Marquette County, the previously established CATF functioned as the plan's steering committee. CATF is comprised of members from a variety of backgrounds throughout the county, providing diverse expertise and representing a wide variety of organizations and jurisdictions.

STEP 1.3: IDENTIFY CLIMATE TRENDS, VULNERABLE POPULATIONS, AND STAKEHOLDERS

Prior to beginning this planning process, the community may have undergone a vulnerability assessment to identify the climate trends and projections for the area and the populations most vulnerable to these changes. If a vulnerability assessment has not been conducted, consider stepping back to do so in order to better inform the community of the current and future risks from climate change. Sources of this information include regional climate experts, such as GLISA, the CDC Climate and Health Program, a state health department program, such as MICHAP and other BRACE-funded health department programs, local health departments, or other organizations involved in climate- and health-related activities. A more comprehensive list of tools and resources can be found in Appendix A.

A vulnerability assessment uses the attributes of a community that can include but are not limited to social, economic, environmental, and physical characteristics to identify certain people and locations that are more at risk of being harmed by climate change. This type of assessment can be used in conjunction with local knowledge to identify the community's vulnerable populations. There are many potentially vulnerable populations.

VULNERABLE POPULATIONS MAY INCLUDE:

- Children (<5 years)
- Elderly (>65 years)
- Socially isolated and living alone
- Those experiencing homelessness
- Ethnic and racial minorities
- Residents without a postsecondary education
- Low-income households
- Non-English speakers
- Outdoor workers
- Commuters
- The chronically ill
- People with limited access to climate control or utility assistance

Figure 8a: *Ishpeming Senior Center in Marquette County. Residents over the age of 65 are considered at greater risk to the negative health impacts of climate change.*

Figure 8b: *Planning team conducts a field visit with stakeholders during the first phase of the Marquette Area Climate and Health Adaptation Project. The team observes where the Silver Lake Dam failed in 2003.*

Representatives of the vulnerable parts of the community should be included in the project's decision making early and regularly to ensure equity in decision making and resource allocation. Invite representatives from or advocates for these vulnerable populations to take part in the planning process. These representatives may come from the local homeless shelter, Veterans Affairs, aging services, or other community service organizations. Looking around the table of those involved and asking, "Who's not here?" is a crucial step to ensuring all are included. In addition, consider ways of reducing barriers for participation in the process. This can include but is not limited to compensating stakeholders for providing their knowledge and expertise to the process, holding meetings at times and locations that are accessible and promote participation, facilitating transportation to and from meetings, and providing childcare during meeting times.

Also important in this step is identifying cross-sector stakeholders (who may or may not be members of the steering committee) to inform and provide feedback throughout the phases of the climate and health adaptation plan development and implementation. Since buy-in is crucial for both the development and implementation of the plan, these stakeholders must be representative of the larger community, including the vulnerable populations and areas identified previously. Consider the scope of the plan and how best to represent community needs and geographic distribution. Invite representatives of local groups engaged in climate action, health departments, physicians, local institutions including universities, emergency management, fire departments, schools, local governments, public works, and other representatives crucial to understanding impacts and developing solutions as identified in the previous readiness and vulnerability assessment steps. The number of stakeholders to include will depend on the community, but typically, no more than 15-25 are necessary (UCLA Center for Health Policy Research, n.d.).

If not already completed in Step 1.2, also identify partner organizations or individuals that may be trusted voices in communicating next steps and results to the broader community throughout the process. This may include local or regional media outlets, faith-based organizations, or community-based organizations that have relationships with disenfranchised or hard-to-reach populations. Established local environmental or public health advocacy groups can be vital in bringing local credibility to the project and provide valuable insight into existing local actions. Area universities and schools can also help garner student and parent attention and participation.

Step 1.3 Checklist:

- ☐ Identify major climate trends and potential related health concerns for the community.
- ☐ Determine vulnerable populations and areas.
- ☐ Develop a list of community stakeholders to invite into the planning and implementation processes.
- ☐ Create a spreadsheet for tracking stakeholders and their level of involvement.

Suggested Tools:

- Climate and Health: A Guide for Cross-Sector Collaboration (https://www.cdc.gov/climateandhealth/docs/CrossSectorClimateandHealth.pdf)
- United States EPA Environmental Justice Screening and Mapping Tool (https://www.epa.gov/ejscreen)
- U.S. Climate Resilience Toolkit: Assess Vulnerability & Risks (https://toolkit.climate.gov/steps-to-resilience/assess-vulnerability-risks)

STEP 1.4: ENGAGE STAKEHOLDERS AND IDENTIFY CONCERNS

Utilize the methods included in the communication plan developed in Step 1.2 to reach out to the stakeholders identified in Step 1.3. In this step, the project leadership and their team will be setting up a meeting, interview, facilitated discussion, or site visit to discuss the climate and health concerns faced by the population or sector each stakeholder represents. These meetings need to involve a level of flexibility to ensure the participants are comfortable in providing quality input based on their experiences. Accurately capturing input from these representatives is essential and ensures the plan reflects community needs. If possible, preserve the responses as stated and avoid rewording. It may be advisable to have a team member act as a scribe while another conducts the interviews or leads the discussions. The UCLA Center for Health Policy Research provides a useful guide to conducting successful interviews (UCLA Center for Health Policy Research, n.d.).

What should be discussed at the meeting?

Though it is an opportunity to provide some background information on climate and health adaptation planning, the primary focus of these meetings is to listen. Use the time to learn about issues the community is facing, including those that may be indirectly related to climate and health. Understand that what is heard in these meetings may shape the direction the plan takes and help determine whom to interview next. Ask a few simple questions to steer the conversation toward their climate and health concerns. In Marquette County, for example, the interviewers used broad questions that allowed the stakeholders to lead the conversation.

Some generalized open-ended questions that can be used by the interviewer include:

- What does your organization do, and whom do they represent?
- What are the climate and health issues for the organization and for the population it represents and why?
- What are the solutions to these issues?
- Are any of these being implemented already?
- What other organizations or individuals in the community would you recommend speaking to about these issues?

CASE STUDY

In Marquette County, the project team used stakeholder meetings not only to gather information about how organizations were experiencing the impacts of climate change but also to ask what other organizations should be included in the conversation. With these suggestions, additional stakeholder interviews were held, ensuring that representative voices of the community provided input to the plan.

Step 1.4 Checklist:

- ☐ Develop interview questions and technique.
- ☐ Select designated interviewers.
- ☐ Conduct key informant interviews.
- ☐ Record key informant input.
- ☐ Track stakeholder participation.

Suggested Tool:

- UCLA Center for Health Policy Research, Section 4: Key Informant Interviews (https://healthpolicy.ucla.edu/programs/health-data/trainings/Documents/tw_cba23.pdf)

STEP 1.5: IDENTIFY STAKEHOLDER PRIORITIES

From the conversations with local stakeholders, some issues will have been recorded. The project leadership team, along with the steering committee, should carefully consider how that information is organized. The major themes identified in this step should reflect the responses of the participants and will shape the narrative of the plan going forward. A tabulated matrix with stakeholder groupings and climate health issue themes may help organize and identify the major climate health issues discussed at the meetings. Suggested groupings of stakeholders by sectors, roles, and perspectives could be climate change, public health, emergency preparedness, underserved populations, and local government. Climate health issues will vary based on what the stakeholders voice. Using a matrix, such as the example shown in Figure 9, can help identify which group discussed what concerns.

Once the information is organized and the stakeholder climate and health concerns have been identified, bring this information back to the steering committee for review. As the local experts and representatives of the community, they can provide feedback as to whether what was captured accurately represents the full spectrum of climate and health concerns faced by the community and can suggest priorities.

It is important to note that while priorities will emerge in this step of the process, they are likely to evolve through the development, implementation, and follow-up phases as more insights are gained. Tracking these changes as part of the evaluation process can reveal the effectiveness of the engagement process and show changes in community knowledge and attitudes.

Concerns not identified as priorities should still be noted and recorded as issues the community is aware of and wants to address. This record can serve as a guide for future climate and health planning actions to be addressed as community capacity grows.

CASE STUDY

In Marquette County, an important community partner and steering committee member was the Superior Watershed Partnership. As this group was already established as a trusted authority on climate action in the area, their partnership provided the project with an initial level of credibility within the community. As a well-connected group with a network of go-to partner organizations, their support on the project helped ensure overall success and continued activity beyond the initial grant period of the pilot project.

In Marquette, the local MSUE educator played multiple roles in the Climate and Health Adaptation project. Part of the Leadership Team, the educator was also a Plan Champion. Well-connected and knowledgeable on the work going on in the community, the MSUE educator helped connect the project team with the community and ensured a strong turnout from major decision makers from across the county throughout each phase of the planning process.

CASE STUDY

In Marquette County, the community stakeholder input was grouped as shown in the table below.

Figure 9: *Climate and Health Concerns Voiced by Community Stakeholders Grouped by Sector*

Climate and Health Concerns	Climate Change	Public Health	Emergency Preparedness/ Underserved	Local Government	Economic Development
Wildfires	•		•	•	
Mental Health	•		•	•	
Vector-Borne Diseases	•	•		•	
Social Conflict	•				
Flooding	•	•	•	•	
Energy	•	•	•		•
Economic Impact	•				•
Resource Allocation	•				
Water Shortage	•	•		•	•
Air Quality		•		•	•
Ticks	•	•		•	
Lake Contamination				•	
Extreme Weather			•	•	•
Road Access	•	•	•	•	
Migration	•	•		•	•
Respiratory Illness		•		•	
Substance Abuse				•	

After reviewing and synthesizing these results, the steering committee identified the primary concerns as flooding, water quality (a combination of the water shortage, lake contamination, and some flooding concerns based on the interviewer's assessment of the responses), access to roads and other infrastructure, and wildfires. Ticks and air quality were seen as important secondary priorities.

The leadership team used a word cloud, shown in Figure 10, to visually communicate how water was the overwhelming concern of the community.

Figure 10: *Word Cloud communicating the priority climate and health concerns voiced at the November 2, 2017 Community Visioning Workshop.*

Step 1.5 Checklist:

- ☐ Compile and organize stakeholder interview data.
- ☐ Identify priority climate health concerns.
- ☐ Note concerns not identified as a priority to maintain a record.
- ☐ Establish priority climate health concerns through steering committee consensus.
- ☐ Track changes in priorities as the plan develops.

Figure 11: *Residents listen to presenter at Climate and Health Adaptation Community Visioning Workshop.*

PHASE 2: ENGAGE THE COMMUNITY AND DEVELOP THE PLAN

The goals of Phase 2 are to engage the broader community, educate them about the issues and the climate and health adaptation planning process, and identify adaptation strategies that the community supports. Using visualizations throughout this phase is essential in helping residents imagine their community in an adapted state. These displays are also important in helping the public understand the pathways between climate change and negative health effects, and how adaptations can disrupt those pathways. Sample meeting materials including an agenda and activities have been included in Appendix B.

PHASE 2 GOALS:

- Engage the community in a climate-adapted community vision.
- Educate the community on climate, health, and adaptation.
- Develop climate and health interventions and the final climate and health adaptation plan.

PHASE 2 EXPECTED OUTCOME: Guided by community input, interventions for addressing the climate and health concerns of the community will be selected and included in the final plan.

PHASE 2 RESOURCES NEEDED:

- Time and resources for organizing and hosting community meetings, including advertisement, venues, materials, refreshments, etc. (see Appendix B)
- Time for developing the plan
- Strong public outreach
- Team member(s) with a skill set for developing visual aids, and tools for them to do so

STEP 2.1: MEETING ONE: COMMUNITY VISIONING

Public engagement can take several forms, but hosting a public kickoff meeting is an effective way to get the information out to the public and gather input beyond the existing group of stakeholders that were engaged in Phase 1. A community kickoff meeting can be used to educate the public on the connections between climate, health, and the community; share the priority concerns heard from the stakeholders; explore and identify community concerns and priorities; and develop a vision of adaptation for the community moving forward. People at this kickoff meeting may or may not already be involved as steering committee members or stakeholders.

Many guides on interactive meeting techniques exist (e.g., Alameda County's "Climate Change Adaptation Workshops: A Planning Guide for Local Government Staff"), but there are some important elements to ensure that participation is strong, the necessary feedback is gathered, and participants leave feeling educated and engaged:

- Use visualizations to educate the public on the connection between climate, health, and built environment interventions.
- Offer multiple methods and opportunities for providing input (e.g., sticky notes, dot voting, worksheets, etc.). Leave time for individual reflection and group discussion and ensure that all participants feel they were able to contribute.
- Keep the focus on the health impacts of climate change and what a climate-adapted future looks like.
- Promote the event when possible by contacting the local media, tapping into informal networks of the steering committee, and reaching out to larger community organizations.

CASE STUDY

In Marquette County, workshop leaders asked community visioning participants the following questions:

- Individually, "What do you think are the biggest climate and health threats facing Marquette County? Think in terms of priority threats previously identified, such as water quality, flooding, water shortage, and wildfires. You may identify other relevant threats as well."
- In groups, "Imagine that you have been away for 20 years and you just came back. With the best hope for your community, how has it changed? What does this area look like in 20 years after the climate and health impacts have been fully addressed? Who lives there? What are they doing? What is housing like? How are people getting around? What amenities and infrastructure are there?"
- In groups, "Rank the major climate change and health priorities of Marquette County."

Posters educating participants on the connection between climate and health and adaptation were on display. Participants responded using worksheets, sticky notes, easel pads, dot voting, and drawing on maps. These activities helped keep engagement levels high throughout the meeting.

Step 2.1 Checklist:

- ☐ Include a public engagement strategy in the communication plan developed in Phase 1.
- ☐ Gather community input.
- ☐ If hosting a public community visioning meeting:
    - ☐ Establish the goals of the community visioning meeting.
    - ☐ Plan community visioning activities.
    - ☐ Publicize the meeting.
    - ☐ Host the community visioning meeting.
    - ☐ Compile and organize community visioning feedback.
    - ☐ Incorporate feedback into existing climate and health priorities.

Suggested Tool:

- National Charrette Institute (https://www.canr.msu.edu/nci/)

TIP

Using interactive, hands-on meeting techniques such as maps to be written on, individual feedback sheets, flip charts, sticky notes, one-word cards, dot voting, etc. can keep participants engaged and actively absorbing and responding to the ideas presented. Posters and other displays to interact with around the room and facilitated group discussions can prove invaluable for gathering input. The National Charrette Institute (NCI), a program "dedicated to transforming the way people work together by building capacity for collaboration by design," provides resources and training for hosting workshops and gathering meaningful community input (NCI, n.d.). Their guides cover preparation before the meeting, facilitation techniques and activities during the meeting, and plan implementation after the meeting, including suggested agendas and outreach techniques.

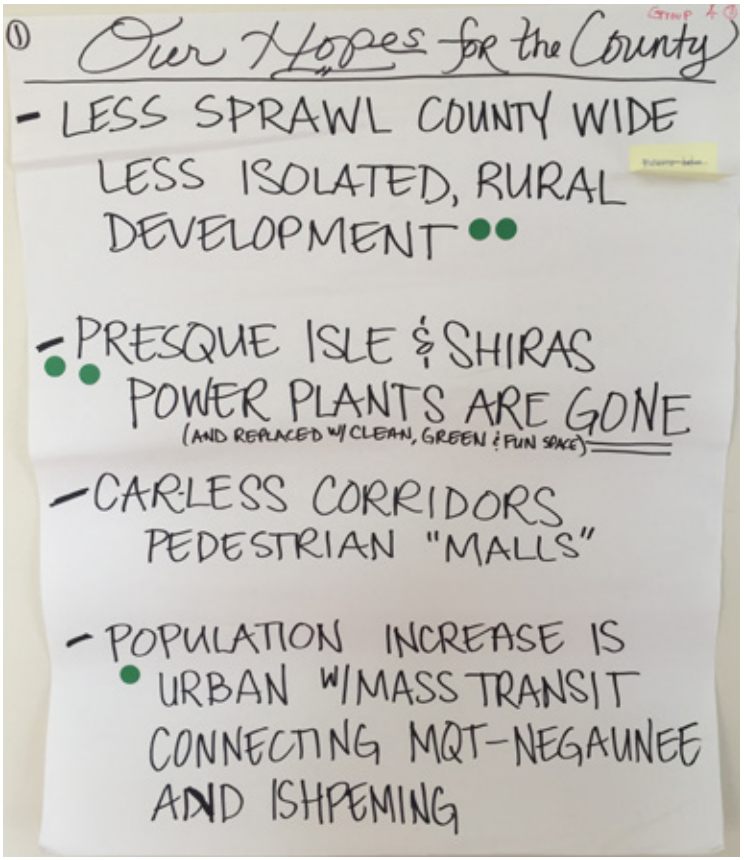


Figure 12: *At the Marquette Area Climate and Health Adaptation Project Community Visioning Workshop, residents used easel pads and dot voting to identify their visions for the future. Ideas included less countywide sprawl, more community green space, pedestrian friendly areas, and mass transit.*

CASE STUDY

In Marquette County, the community was already advanced in terms of climate adaptation planning with explicit climate plans and other related water quality and sustainability initiatives focusing on the Lake Superior Watershed, the County, and the City of Marquette. This gave the project team a starting place for identifying potential impacts and strategies. However, the health and vulnerability components were not as developed, so additional best practice and data sources were consulted as well. Some of these helpful resources are included in Appendix A.

The metrics used in Marquette County were identified through interviews with community leaders. Some of these metrics may be useful for other communities and can be found in Volume II of the Marquette Climate and Health Adaptation Guide (https://www.canr.msu.edu/resources/marquette-area-climate-and-health-adaptation-guidebook-volume-ii-policy-and-metric-recommendations).

STEP 2.2 IDENTIFY POTENTIAL ADAPTATIONS AND METRICS AND DEVELOP VISUALIZATIONS

After gathering stakeholder input, identifying priorities, and creating a community vision, the priority climate and health concerns identified at the end of Phase 1 should be further refined, and the collective vision of what the community could look like when successfully adapted should be more clearly described. With this information, existing strategies and before-and-after visualizations can be updated or new ones developed that address the community's concerns and vulnerabilities.

STEP 2.2A: IDENTIFY POTENTIAL ADAPTATIONS AND METRICS

Several resources can be used to identify potential adaptation strategies for a community. Start by reviewing existing plans within the community and assess the degree to which they consider climate and health issues and have developed adaptive responses. Though the goal is to create a climate and health adaptation plan, the recommended adaptations should align with and fit into existing plans, projects, or initiatives. Recommended adaptations can include both physical changes in the built environment and policy changes that allow these physical adaptations. Suggested documents to review include hazard mitigation plans, wildfire management plans, emergency management plans, jurisdictional sustainability or climate action plans, local health department plans, and comprehensive master plans. A strategy that already has buy-in through a separate initiative or provides co-benefits through another plan is more likely to have resources allocated toward it and be implemented. Modeling strategies and best practices on those from other, similar communities can also be helpful, as can referencing state, regional, and national guides.

While identifying existing plans and tools for addressing concerns is the first step, the community also needs to be able to measure the impact of the actions taken. Each community will have different metrics that work for them based on their strategies, capacity, and data availability. Identifying useful metrics takes time and deliberate conversations with community stakeholders such as the local health department, planning departments, and emergency services to determine what is already being measured. Some examples of data that could be used to measure the impact of adaptations are:

- Number of individuals reached by public education campaigns
- Number of trainings for clinic and health care providers
- Number of tick-specific education signs in public places (vector awareness/adaptation)

- Number of residents provided subsidies for asthma treatment (air quality adaptation)
- Number of road closures due to flooding or extreme events

Step 2.2a Checklist:

☐ Review existing climate- and health-related community plans.

☐ Identify existing plans, policies, and activities that address the climate and health priorities of the community.

☐ Research and develop a menu of recommended climate adaptations to address the concerns of the climate and health priorities of the community.

☐ Identify what is already being measured by the community that can be utilized as a metric and include these in the evaluation plan.

☐ Identify new metrics to measure the impact of potential climate and health adaptations and include these in the evaluation plan.

Suggested Tool:

- Marquette Area Climate and Health Adaptation Project Guidebook (https://www.canr.msu.edu/climatehealthguide)

STEP 2.2B: CREATE VISUAL DISPLAYS OF CLIMATE HEALTH ISSUES AND ADAPTATIONS

Visualizations can help educate stakeholders on the connection between climate, health, and built environment interventions and help them imagine a climate-adapted future within their community. When used effectively, these displays can reduce the barriers of participation for previously unengaged residents and act as an interactive tool for gathering input. They can excite residents about the potential of an adapted future, helping conceptualize previously vague terminology within the context of their community.

Visualizations can take many forms, including images of the impacts of climate change on the community and its residents, before-and-after imaging of what climate change adaptation could look like in different locations throughout the community, and GIS maps identifying vulnerable populations or potential locations to implement adaptation measures.

The types of visual displays and the extent to which they can be used depends on the resources, time, and ability of the project team and steering committee to develop extensive imaging or mapping. Here it is important to draw on existing community resources and utilize existing tools. For before-and-after imagery consider:

- Is there a nearby university with students who would be interested in this type of work?
- Are there university extension educators in the community who could provide guidance and expertise?
- Can a larger regional planning body play a role in the process?
- Do any local government partners have a planning firm on contract that could assist with this sort of work?

For mapping and other data viewing visualizations, consider some of the resources listed in Appendix A.

CASE STUDY

In Marquette County, images were used to portray a variety of sites throughout the community before and after installing an adaptation. The sites chosen for imaging were representative of sites previously identified as problematic throughout the county. Graduate students in the School of Planning, Design and Construction at Michigan State University developed the after-image renderings of various built environment adaptation measures that could address the concerns voiced by the community. Many image portrayals involved green infrastructure, such as rain gardens, green roofs, and tree plantings, but transportation adaptations such as bike lanes, road bump-outs, and structure-related adaptations – such as LEED certifying and energy upgrades – were also included.

Step 2.2b Checklist:

☐ Identify potential means for including visualizations in the climate and health plan and planning process, specifically using the capacity of existing community institutions to provide such resources.

☐ Develop effective visual aids based on resources available and community input.

Suggested Tools:

- CDC Environmental Public Health Tracking Data Explorer (https://ephtracking.cdc.gov/DataExplorer/#/)
- United States EPA Environmental Justice Screening and Mapping Tool (https://www.epa.gov/ejscreen)

STEP 2.3: OBTAIN FEEDBACK

After developing visual aids and a list of potential strategies, it is important to once again assess the direction of the project by garnering steering committee and stakeholder feedback. This can be done in several ways but consider holding a second public meeting to present the findings, potential strategies, and visualizations to all stakeholders and gather their input. Participants will likely feel comfortable knowing the format, and it encourages the participants who may not normally interact to connect and share ideas. The following events should occur in sequential order.

STEP 2.3A: MEETING TWO - GATHERING COMMUNITY FEEDBACK

At the second meeting, display initial proposals for interventions based on the first round of community and stakeholder input. Community feedback at this phase of the project should be an interactive and engaging process. This is a second chance to excite the community about the idea of climate and health adaptation and garner community support for the project.

The goal of the meeting should be for the project team to understand if the strategies they have proposed reflect the desires and needs of the community. When planning this meeting, think about the most effective way to engage and educate a large audience on climate and health adaptation and to obtain feedback on proposed ideas. Again, visualizations and interactive meeting techniques are highly effective, interesting for participants, and helpful for gathering the necessary input.

Step 2.3a Checklist:

☐ Establish a community input strategy and incorporate it into the communication plan developed in Phase 1.

☐ Share initial proposals with the community at a public event.

☐ Gather community feedback on proposals.

☐ If hosting a community input meeting:

- ☐ Establish the goals of the community input meeting.
- ☐ Plan the community input process and activities.
- ☐ Gather the resources needed for the meeting.
- ☐ Publicize the meeting.
- ☐ Host and facilitate the community input meeting.
- ☐ Compile and organize community input.

☐ Revise potential climate and health strategies and visual aids to incorporate community input.

When recording community input, be sure to include the raw feedback from the community in report appendices or a publicly accessible forum. Transparency is essential for maintaining public support, and methods like these are easy ways to show a commitment to transparent local engagement.

CASE STUDY

In Marquette County, a second meeting about climate and health adaptation brought over forty stakeholders to weigh in on what had been developed so far. The extensive before-and-after visualizations of 16 sites around Marquette County were displayed around the large community room, along with posters explaining how the built environment adaptations would address the community's expressed climate health concerns. A PowerPoint presentation informed the attendees about the process and findings so far. Participants were able to interact with the images and provide feedback by writing on sticky notes and applying them directly to the images and through worksheets provided on tables. Participants were asked three questions:

1. What do you like about the design interventions?
2. What is missing from the design interventions?
3. What suggestions do you have to improve the designs, policies, and metrics presented today?

The meeting garnered useful feedback regarding what the community liked and disliked about proposed interventions. The feedback guided which design intervention and policy actions were included in the final volume of the Marquette Area Climate and Health Adaptation Plan which focused on further prioritization of issues and, more importantly, solutions.

Figure 13: *Group listens to presenter at Marquette Area Climate and Health Adaptation Project Community Visioning Workshop.*

CASE STUDY

In Marquette County, the plan's steering committee formed a Technical Review Team to review the design recommendations carefully. The Technical Review Team added a few more recommendations, identified some that were already started within the community, and helped clarify the details of others. Most importantly, they confirmed that the recommendations met the needs and capabilities of the community.

STEP 2.3B STEERING COMMITTEE INPUT

At this step, the recommended design interventions and policies have been developed, and community feedback has been gathered. This is a critical time for the steering committee to provide feedback on the recommendations that will ultimately be the priority of the implementation phase. The steering committee should double-check that the recommendations made in the plan suit the community and that nothing has been missed. This is one last opportunity for any input on what is to be included in the recommendations in the plan. Project leadership can use this feedback to complete a first draft of the community's climate and health adaptation plan.

Step 2.3b Checklist:

- ☐ Coordinate a mechanism for steering committee feedback on recommended adaptations (meeting, document sharing via email or cloud, etc.).
- ☐ Share recommended adaptations with the steering committee and obtain feedback.
- ☐ Complete the first draft of the climate and health adaptation plan.

Figure 14: *Five participants observe before and after design imaging posters for adaptation interventions in the Marquette area.*

STEP 2.4 FINALIZE THE PLAN USING RECOMMENDATIONS AND VISUALIZATIONS

Based on feedback provided by the community and steering committee, the recommended adaptations can now be finalized and compiled into a final climate and health adaptation plan. Utilize the visualizations developed along the way to help the readers connect with the adaptation recommendations described in the text. At a minimum, the plan should explain the connection between climate and health, describe the planning process, and list the objectives and recommendations for addressing the community's climate and health concerns.

Step 2.4 Checklist:

- ☐ Revise the draft plan to incorporate steering committee feedback.
- ☐ Complete the final climate and health adaption plan.

CASE STUDY

In Marquette County, plan developers created two volumes of the Marquette Area Climate and Health Adaptation Plan. Volume I was developed as an educational piece for the general public, describing the planning process, visual aids using extensive before-and-after imaging, and explaining how built environment interventions can interrupt the climate-health pathway. Volume II, developed for the community's public officials, included an extensive list of over 50 objectives and 140 built adaptation and policy recommendations for addressing climate and health within the community.

PHASE 3: PRIORITIZE AND IMPLEMENT

Now that a plan for addressing the climate and health concerns has been developed, it is time to begin prioritizing and implementing the actions recommended in the document. Though the recommendations in the plan are grounded in local input and existing opportunities, they still represent a menu of options, some of which may not be ready for implementation in the near-term.

PHASE 3 GOALS:

- Prioritize the menu of recommended climate and health adaptations.
- Develop a plan for implementing the priority objectives.
- Implement the priority objectives and actions of the climate and health adaptation plan.

PHASE 3 EXPECTED OUTCOME: Priority objectives are identified, and implementation of the planned adaptations begins.

PHASE 3 RESOURCES NEEDED:

- Time for planning and hosting a workshop
- Funds to cover advertising, venue, workshop materials and refreshments
- Commitment by and time of community decision makers to provide details on priority goals and actions

STEP 3.1: HOST AN IMPLEMENTATION PRIORITIZATION WORKSHOP

Gather community input by bringing as many stakeholders as possible back for another workshop to focus on implementation prioritization. The goal of this workshop is to identify the priority climate and health adaptation objectives and actions and how to implement them. The leadership team will outline a process for implementation by gathering commitments and ideas from stakeholders for who should contribute, timelines, funding strategies, and opportunities for leveraging existing initiatives.

This meeting is an opportunity to bring community leaders together to make actionable decisions for moving forward with the climate and health adaptation plan. It can also be used to continue to build public consensus on the implementation process of the previously determined goals and strategies. There are many participatory planning methods this

meeting could follow, including the methods suggested for Step 2.3a: Gather community feedback. At this meeting, it is important to do the following:

1. Explain the project history, including public participation and process to date.
2. Convey the findings or plan.
3. Use visual aids to show the health impacts of climate on the area and proposed adaptations.
4. Gather representative input.

It is important to have stakeholders at the table who can provide details about how actions will be implemented. Consider who will be involved in acting on these cross-cutting policies. Consider specifically inviting local planners, local health department officials, emergency managers, fire chiefs, drain commissioners, local utility managers, natural resources managers, elected officials, community organizers, environmental advocacy groups, and others who play roles in community programs.

Step 3.1 Checklist:

- ☐ Establish a process for how priorities will be set.
- ☐ Prioritize objectives and adaptations.
- ☐ Begin gathering implementation details.
- ☐ Host a public community prioritization workshop.
  - ☐ Establish the goals of the prioritization workshop.
  - ☐ Plan the prioritization and implementation process and activities.
  - ☐ Publicize the meeting, deliberately inviting all previously engaged stakeholders and community decision makers.
  - ☐ Host the prioritization workshop.
  - ☐ Compile and organize the prioritization and implementation feedback.
- ☐ Begin drafting an implementation plan.

Figure 15: *Posters displayed at climate and health adaptation community meeting explaining the planning process and depicting before and after adaptation images.*

Figure 16: *At the Prioritization Implementation Workshop on January 29, 2019 a group of 12 sit around a table brainstorming the implementation of the climate and health priorities for Marquette County.*

STEP 3.2: DEVELOP A STRATEGY FOR IMPLEMENTING THE CLIMATE AND HEALTH ADAPTATION PLAN

Once adaptation priorities have been identified and community leaders have begun to outline specific resources and partners, the leadership team can develop a strategy for full implementation of the climate and health adaptation plan. At this step, create specific details on action steps for moving forward with the community's priorities, including how the steering committee and other local stakeholders should be taking ownership of the process. Here are some suggested details to include in the implementation strategy:

- A short-term (1 year) step to implementing a recommendation from the Plan (e.g., Identify model communication plans)
- A medium-term (2–3 years) step to implementing the recommendation from the Plan (e.g., Develop marketing materials and install signage)
- A long-term (4 years or more) step to implementing the recommendation from the Plan (e.g., Develop landscaping standards for property owners)
- The party responsible for implementing the recommendation (e.g., City or county planning departments, health department, fire departments)
- Potential upcoming opportunities for implementing the recommendation (e.g., upcoming plan updates)
- Resources needed for implementing the recommendation (e.g., time, talent, money)
- Possible funding mechanisms for implementing the recommendation (e.g., local community foundation grant)

Ongoing conversations will be helpful to fully develop the ideas developed in this step, firm up commitments, and focus on details to ensure the priority health adaptation recommendations are implemented. Once the details of the priority health adaptation strategies are identified, an implementation strategy can be formally developed for the community to reference and guide the actions recommended by the Adaptation Plan moving forward.

CASE STUDY

In Marquette, the implementation workshop took place as a series of three meetings. The first meeting, held in the afternoon, gathered fifty public officials from around the county to discuss the implementation of the recommendations of the Marquette Area Climate and Health Adaptation Plan. Informational posters were placed around the room, highlighting the project, including how adaptation designs can impact health, before-and-after imaging of sites throughout Marquette County, and the Plan's goals. Participants used colored dot stickers to vote for their priority objectives, worked in groups to develop strategies for meeting the priority objectives (including details on who could contribute, timelines, funding strategies, and opportunities for implementation), and provided feedback and ideas for adaptation projects.

The second meeting was held in the evening and invited the community to view the posters, provide input on priorities, and suggest ways for people to get involved.

In the third meeting the following morning, the planning team met with the steering committee to share the results of the prior two meetings and determine the next steps of the project. The committee was pleased with the high level of participation and interest in the workshop and noted the important connections and conversations that were taking place because of it. Overall, the implementation workshop helped narrow down the adaptation priorities for the community and initiated the identification of steps and necessities to make those priorities happen.

CASE STUDY

In Marquette County, working groups were critical to working out details and identifying how the community could use existing resources to ensure their priority objectives were met. Working groups were created from the original groups of public officials formed at the implementation workshops. These original groups were formed around the four priority categories of the area (vector awareness, air quality, emergency response/extreme events, and water-related concerns). Working group leaders were members of the steering committee. Leaders connected with group members through Google Docs to collect implementation details on the top priorities within each category. Useful details, such as related projects that were already initiated, possible grant opportunities, and interagency collaboration and data sharing possibilities arose from the implementation workshop and these working groups.

Step 3.2 Checklist:

- ☐ Establish a process for developing implementation details for prioritized adaptations.
- ☐ Establish implementation details for prioritized recommendations, including timelines, responsible parties, upcoming opportunities, resources needed, and possible funding mechanisms.

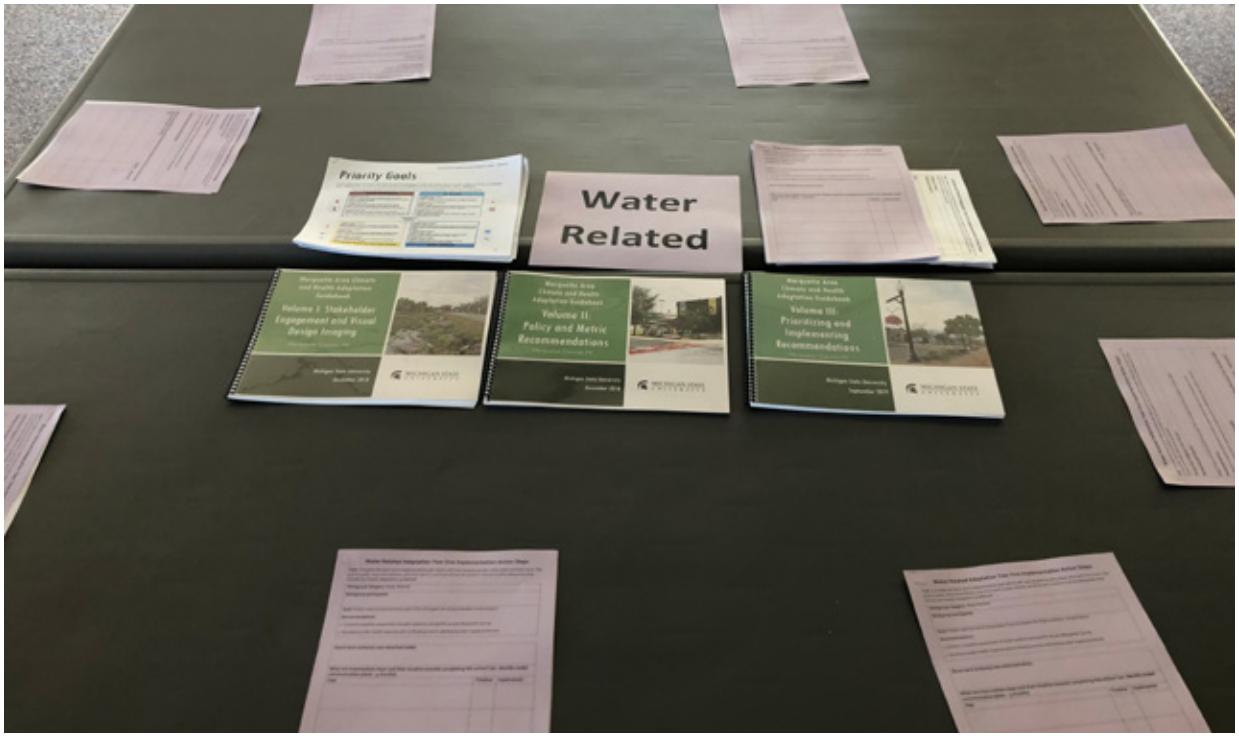
STEP 3.3: IMPLEMENT THE COMMUNITY'S CLIMATE AND HEALTH ADAPTATION PLAN

With clear steps laid out and responsible parties identified, there should now be a solid framework to move the plan's priority objectives and actions forward.

Step 3.3 Checklist:

- ☐ Use the details developed in the implementation strategy step to initiate parts of the climate and health adaptation plan

Figure 17: *Worksheets and prepared materials are placed around a table in preparation for the September 18, 2019 Marquette Area Climate and Health Adaptation Action workshop.*



PHASE 4: MONITOR, UPDATE, AND KEEP ACTIVE

With a Climate and Health Adaptation Plan and implementation strategy published and supported by the community, keeping the plan active and relevant is important for ongoing adaptation. As updated climate data is published, it is important to update the plan and ensure the adaptation strategies are still adequate to protect the community's health and prosperity. In addition, the actions that have been implemented should be evaluated based on the evaluation plan and metrics that were previously developed to determine if they were effective as interventions. These evaluations will provide information that will be critical for guiding the climate and health adaptation efforts to more feasible and effective actions.

Using the metrics developed in Step 2.2a, the community can track progress made on the plan's adaptation actions. The plan should be updated in a way that allows for progress to be compared to the measurements of metrics taken in the baseline year. If target metrics

CASE STUDY

Implementation of a Climate and Health Adaptation Plan will look different for every community. In Marquette County, engaged community leaders suggested various adaptation projects with which their organizations could assist. Through continued partnerships and grant funding, the community implemented the adaptive actions identified in the Plan.

and objectives have been achieved, the community can revisit the strategies and potentially set new targets. Alternatively, if new priorities become obvious, additional objectives and strategies could be added to the plan.

It is important to identify at least one person or group during the planning and implementation phases who will ensure that this process doesn't lose momentum.

PHASE 4 GOALS:

- The plan is incorporated into community policies and plans.
- The plan remains active and relevant.
- The plan is regularly revisited and revised to keep consistent with the objectives and overall goals of the community.

Figure 18: *Through the Marquette Area Climate and Health Adaptation Action (MACH A²) grant two Marquette County communities developed area-specific adaptation visions. In these images, City of Negaunee residents plan for a climate and health adapted Teal Lake Shoreline at a visioning session held on December 17, 2019.*

PHASE 4 EXPECTED OUTCOME: The plan is revisited and revised on a regular basis. Actions are continuously implemented in the community.

PHASE 4 RESOURCES NEEDED:

- Time, staff, and expertise to appropriately collect and analyze data
- Committed leadership
- Access to updated climate data and expertise to interpret it

Suggested Tools:

- CDC Climate and Health Evaluation Planning Resources (https://www.cdc.gov/climateandhealth/eval.htm)

By participating in the development of a climate and health adaptation plan, the community will have established a strong foundation for building resilience and adaptive capacity. However, this plan represents the beginning of an ongoing process to ensure it remains relevant, up-to-date, and active.

Phase 4 Checklist:

The ideal climate and health adaptation plan will do the following (Adapted from USGCRP, 2018):

☐ **Establish targets:** While the objectives and action steps laid out in the plan are a starting place for action in the community, defining clear targets for each step along the way can help keep the project on track. These targets are best established from the beginning and can later be amended if necessary.

☐ **Track actions and share progress:** Consider a way to track actions that are happening throughout the region and to communicate this information with agencies and residents throughout the community. Tracking actions provides a platform for collaboration across agencies and organizations and creates a network of experts and resources upon which other communities can draw. Regularly communicating these actions to the public and public officials keeps community momentum alive.

☐ **Maintain engagement:** The process of developing this plan involved explicitly engaging vulnerable populations in a deep and meaningful way. Capitalize on this inclusion by ensuring these community members continue to be part of the conversation and action.

☐ **Stay connected:** The success of this plan relies on public officials from agencies at various levels throughout the county working together. Action on the larger scale depends on daily actions by health professionals, planners, engineers, nonprofits, faith-based workers, social service professionals, and more. Keeping the larger team connected and up-to-date keeps momentum going.

☐ **Evaluate progress:** With measurable actions and established targets, it is important to take time to assess whether actions are having their intended impact and if targets need adjustment. Regional bodies may play a critical role in this reflection.

☐ **Stay up-to-date and relevant:** Establish a method for revisiting and updating recommendations as new climate information becomes available. This involves being informed on up-to-date climate and demographic information for the area and ensuring the strategies and priorities reflect any changes.

☐ **Connect to other climate and health initiatives:** Develop methods for sharing this story and supporting other communities interested in developing similar plans. This project is unique in the emerging field of climate adaptation in that public health is at its forefront, and sharing the community's story can inspire and guide other communities through similar, public health-led climate adaptation projects.

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USING VISUALS TO ENGAGE AND EDUCATE

According to the literature regarding scientific communication, visual information, complemented by relevant textual input, can highly affect the individual's cognition and behavior about crucial issues, especially climate change (O'Neill et al., 2009; O'Neill et al., 2013; Hart et al., 2016). Visual aids help communicate and transform unseen and unfelt information about climate change into substantial and accessible knowledge that is ready to be examined and evaluated by key players, scientists, and politicians (Smith et al., 2009; Wang et al., 2018).

Climate change is represented through a range of visual mediums, such as maps, photographs, videos, simulations, 3D models, charts, infographics, etc. Landscape architecture visualization, specifically realistic experiential landscape, is also another type of visual communication. Visual tools are used in public workshops to build consensus, resolve conflict, induce negotiations, and develop strategies. They can also help give a voice to unprivileged communities (Ravetz et al., 2017).

STEPS FOR DELIVERING APPROPRIATE VISUAL AIDS

Landscape architects, urban designers, and planners can adopt the following steps to effectively communicate climate change actions to the public using visual aids:

1. Identify the goal(s) of visual aids.
2. Recruit and engage stakeholders, consultants, and the community to address the public's general concerns and to highlight their needs and aspirations.
3. List and select possible vulnerable sites and communities within the community to assist in developing inspirations for the experiential landscape images.
4. Collect spatial, social, and environmental data for each selected site.
5. Examine spatial, social, and environmental threats, assets, and opportunities for each selected site.
6. Explore potential design interventions for climate change impacts for rural communities.
7. Identify appropriate design interventions for each selected site.
8. Identify the planning and design phases for the project.
9. Select effective visual techniques to communicate climate change impacts and actions with the public.
10. Develop and share a preliminary set of realistic experiential landscape images (after images) to ensure the public's involvement and to seek the public's feedback at the early stages.
11. Review and finalize the preliminary set of realistic experiential landscape images based on the public's input.

DESIGN TOOLS FOR BETTER VISUALIZATIONS

Realistic landscape images are commonly referred to as "after images" in the landscape architecture and urban planning fields. A series of before-and-after images of selected vulnerable sites stimulates the community's imagination and helps the public to picture multiple viable solutions for building a healthier and more resilient future.

When representing a set of after images to the public, it is important to create images with clear and simple design ideas, while keeping the visuals rich with local physical, social, and environmental features.

Landscape architects and urban designers can consider adopting the following set of visual guidelines to better convey climate change design interventions to the public in urban, suburban, and rural communities:

- Adopt cost-effective design interventions, such as converting vacant lots to community gardens or transforming on-street parking spaces into infiltration planters.
- Promote walkable communities, mixed-use, and sustainable design solutions.
- Use local vegetation and landscape.
- Use elements in the images that enhance the local cultural and spatial identity.
- Integrate the public's visions as often as possible.
- Avoid using any unnecessary visual or physical details in images that may make the image less realistic.
- Develop several design options per site.
- Take good perspective pictures of designated sites relevant to their potential future use. For example, to illustrate the development of a wide street, it is preferable to take pictures from the center of the street or looking down a sidewalk, which can then be used to demonstrate the future design changes that can happen along the street, such as adding trees, vegetated medians, etc.

CASE STUDY

In Marquette, the design team developed a series of realistic landscape images for selected sites across the county using Adobe Photoshop Elements 14. The tasks for the design team in Marquette adaptation project included the following:

- Educate the public about climate change.
- Create common ground between the public and stakeholders.
- Equip the community with diverse landscape designs to create a resilient community.

VISUAL AID DESIGN PROCESS

In the Marquette project, the MSU design team created educational posters about climate change impacts and adaptive actions (such as before-and-after image posters) to help community members understand the impact of climate change actions and presented them in public meetings and workshops. (See Figures 19-24)

The design team developed after images for several vulnerable sites throughout the county. These images were used in community meetings to help residents imagine what climate adaptation could look like in their communities and to consider possible side benefits not related to climate change adaptation.

The visualizations give a realistic view of proposed landscapes and other built adaptations through the use of natural colors, street furniture, and local spatial and environmental features, with minimal use of any digital effects that might make the images less clear and realistic. The series of after images demonstrated different potential adaptation strategies,

Visualizations give a realistic view of proposed landscapes

such as using Green Infrastructure (GI) techniques. GI includes various methods to manage water, such as vegetation, tree canopies, rain gardens, bioswales, wetlands, and permeable pavement. (Lindholm, 2017).

To further improve understanding of the proposed adaptations, the design team developed another set of after images that highlighted only the adaptation designs and interventions used for each site. In this type of imagery, the team utilized icons that represented the different climate change impacts, such as ticks, air quality, flooding, wildfire, etc., to effectively communicate the contents of the images, and to draw the public's interest. (See Figures 25a-28b)

Figure 19: *A poster used during the Marquette Area Climate and Health Adaptation Project explains why the community needs to adapt and how adaptation can be done.*

Figure 20: *A poster used during the Marquette Area Climate and Health Adaptation Project explains adaptation.*

Figure 21: *Senior center in Marquette County before and after adaptation interventions. Adaptations include using existing open space for a community garden.*

Figure 22: *Lot in Marquette County before and after adaptation interventions. Adaptations include using existing open space for a mixed use building, creating a more pedestrian-friendly environment, and using renewable energy.*

Figure 23: *Culvert in Marquette County before and after adaptation interventions. Adaptations include increased vegetation and a walking path.*

Figure 24: *A wall and sidewalk in Marquette County before and after adaptation interventions. Adaptations include increased vegetation and permeable pavement.*

Figure 25a: *A park in Marquette County before and after adaptation interventions.*

Figure 25b: *A park in Marquette County after adaptations including increased vegetation, permeable pavement, and tick-awareness signage.*

Figure 26a: *Neighborhood in Marquette County before and after adaptation interventions.*

Figure 26b: *Neighborhood in Marquette County after adaptions including increased vegetation, permeable pavement, and insect protectant screening.*

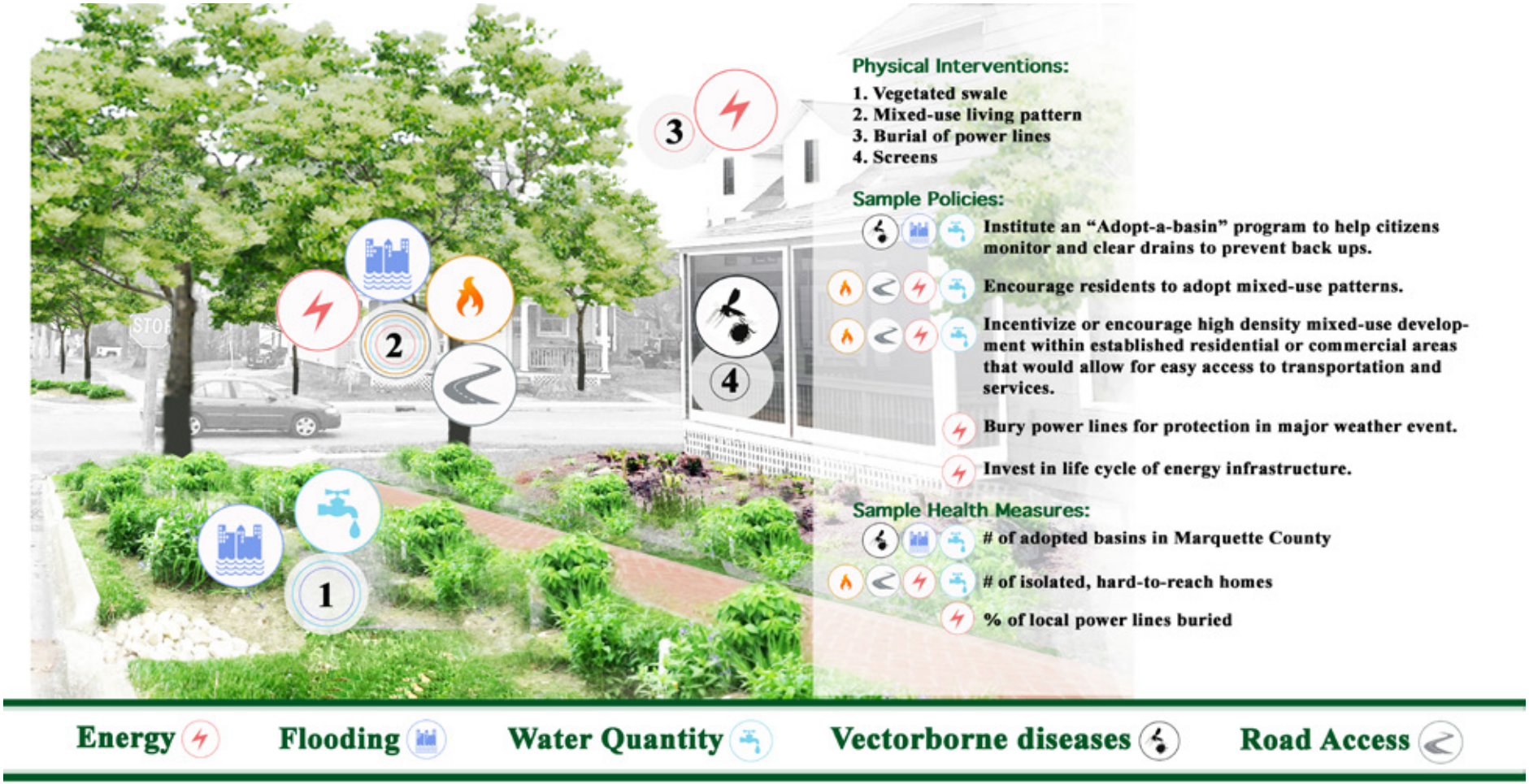
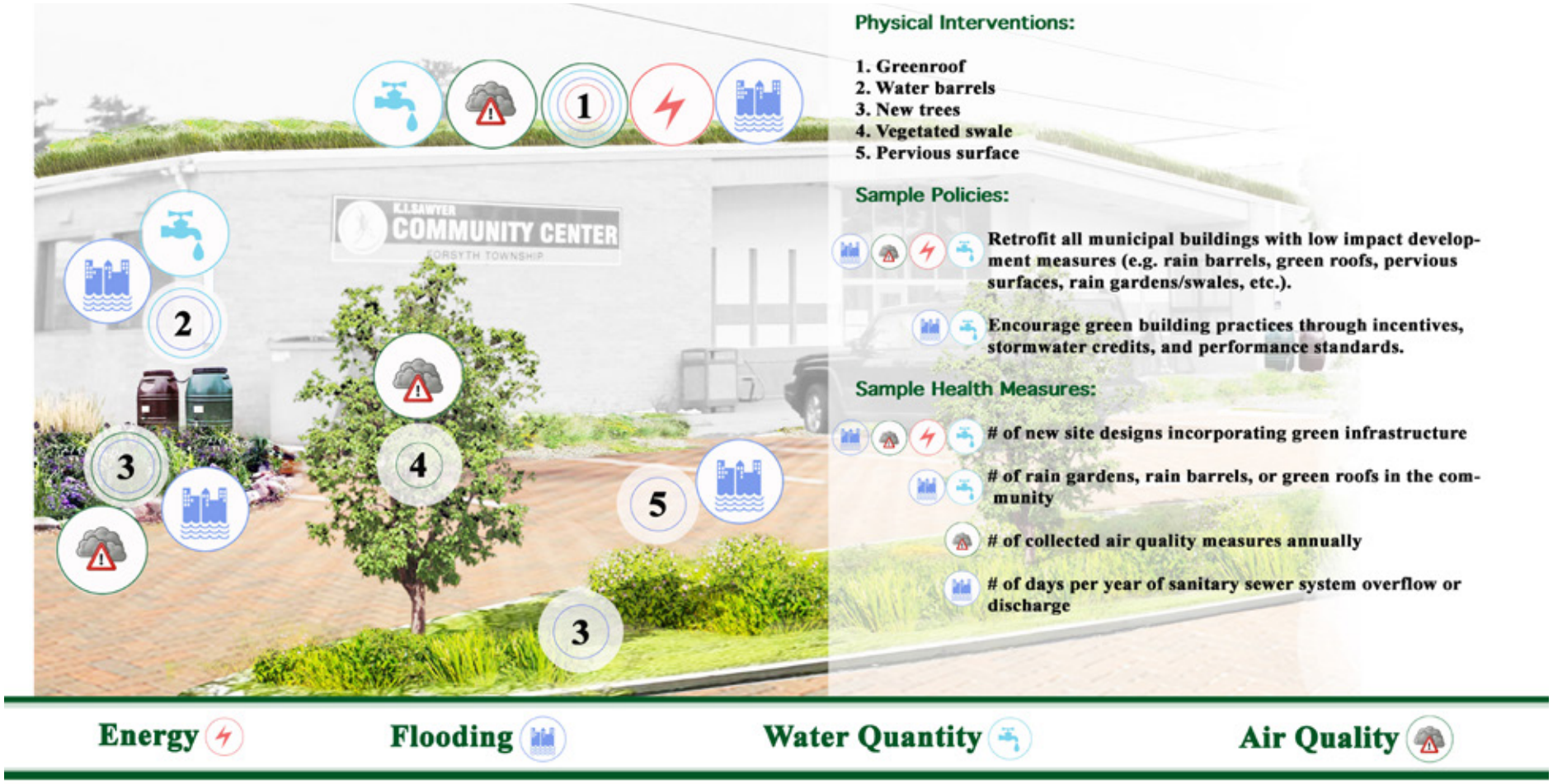


Figure 27a: *A neighborhood in Marquette County before and after adaptation interventions.*

Figure 27b: *A neighborhood in Marquette County after adaptations including increased vegetation, permeable pavement, and solar panels.*

Figure 28a: *Community Center in Marquette County before and after adaptation interventions.*

Figure 28b: *Community Center in Marquette County after adaptations including increased vegetation, permeable pavement, and water capture.*



APPENDICES

APPENDIX A. RESILIENCE AND ADAPTATION PLANNING GUIDANCE

Background Documents

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Local Planning Within State and Federal Policy

- The Federal Emergency Management Agency (FEMA) Hazard Mitigation Plan Requirement requires State, tribal, and local governments to include climate change considerations to qualify for distaster funding. (https://www.fema.gov/hazard-mitigation-plan-requirement)
- The Michigan Safe Drinking Water Act includes a requirement for asset management plans to be submitted by water utilities (drinking, waste, storm) to the Department of Environment, Great Lakes, and Energy (EGLE) that "aims to ensure that water systems are considering all costs as they plan for the future." (https://www.michigan.gov/egle/0,9429,7-135-3313_3675_3691-428688--,00.html)

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APPENDIX B. SAMPLE MEETING MATERIALS #1

Marquette Area Climate Health Adaptation Workshop

KICKOFF LUNCHEON – Nov. 2, 2017

AGENDA

Lunch will be ordered from Border Grill on Nov. 2 and arrive at 11 a.m.

11:30 a.m.: Gather for Lunch

-All attendees are given 2-3 post-its upon entering to brainstorm priority issues concerning Marquette's Climate and Health impacts.

Question: "What do you think are the biggest climate and health threats facing Marquette County? Think in terms of priority threats previously identified, such as water quality, flooding, water shortage, and wildfires. You may identify other relevant threats as well."

They are then placed on the wall horizontally. Repeated items are placed vertically under the same heading.

-Attendees sit at any of the tables to each lunch

11:45 a.m.: MSU Team Presentation

This includes an overview of current project status, process, findings, and next steps, as well as the format and desired outcomes for today's meeting.

12:00 p.m.: Small Group/Table Discussion

Visioning Exercise: Ask attendees to describe a future physical state for the project area that addresses climate and health impacts. The visioning exercise gives the community members an opportunity to express their values by describing their vision of the completed project.

[See below for instructions]

1:00 p.m.: Group Report Outs, top 2-3 ideas

1:25 p.m.: Next Steps

1:30 p.m.: Meeting adjourns.

ACTIVITY

Instructions for Visioning Exercise: The facilitator asks the question: "Imagine that you have been away for 20 years, and you just came back. With the best hope for your community, how has it changed? What does this area look like in 20 years after the climate and health impacts have been fully addressed? Who lives there? What are they doing? What is housing like? How are people getting around? What amenities and infrastructure are there?"

- Take five minutes to write your vision ideas, one idea on separate sticky notes. After everyone has completed at least four post-its, then the first person reads his or her one idea to the group and then draws it on the aerial photo/map. The recorder places the post-it on the flip chart under themes and writes a short statement summarizing the sticky note idea. The second person repeats. The group goes around round-robin, one idea at a time for at least three rounds.
- Talk with your pen! Be sure to draw your idea on the map.
- After three rounds, the recorder facilitates the group to merge any similar items.
- The group then prioritizes the vision elements with dot voting. Everyone gets up at once and silently uses **green** dots to vote for their top vision items. **NO DOUBLE VOTING**. (A good rule of thumb is to hand out one green dot per every three vision items).
- Use a **red** dot for any possible items that you "just can't live with." Red dots are not vetoes, just a minority report. Red dots do not have to be used.
- The recorder tallies up the green dot votes and identifies the group's top three items. The group agrees on the top three.
- If there are any red dot items, the author of the item is asked to clarify the point to be sure that everyone understands the intent. If it is still a deal-breaker, then the item is noted in the report as an area of disagreement. The red dots are an effective method for identifying issues that potentially could make or break the project.
- The recorder circles the three items that have the most green dots. The group then agrees on the top three items. The recorder writes the top three vision elements on the small record sheet.
- Each group's spokesperson reports back to the larger group on their top three values and vision elements using the flip charts and the maps. (Max 3 minutes per group).

APPENDIX B. SAMPLE MEETING MATERIALS #2

Marquette Area Climate Health Adaptation Workshop 2

Initial Design & Policy Presentation and Feedback – Mar. 26. 18

4:00 p.m.: MSU Team Presentation

This includes an **overview of current project status**, process, findings, process, design and policy samples, and next steps, as well as the **format and desired outcomes for today's meeting**.

4:45-6:00 p.m.: Community Design and Policy Review and Feedback

Please review the sample designs and policies and **provide feedback** in the form of the following **three questions** and with sticky notes directly on the images and posters. The team is available to answer any questions or discuss feedback.

Question 1: What do you like about the design interventions?

Question 2: What is missing from the design interventions?

Question 3: What suggestions do you have to improve the designs, policies, and metrics presented today?

Additional Thoughts or Comments:

APPENDIX B. SAMPLE MEETING MATERIALS #3

Marquette Area Climate and Health Adaptation Project Implementation Kickoff

Tuesday, Jan. 29, 2019 | 2:30 p.m. to 5:00 p.m. | Marquette Township Hall

Project Team: Michigan Department of Health and Human Services, Michigan State University Extension and School of Planning Design and Construction, Marquette County Health Department, Marquette Climate Adaptation Task Force, Superior Watershed Partnership

Welcome to the Marquette Area Climate and Health Adaptation Project Phase III Implementation Kickoff Meeting!

Background: The Marquette Area Climate and Health Adaptation Project is a pilot project to build adaptive capacity at the local level by integrating public health considerations into existing community and climate adaptation planning initiatives.

Over the past two years, the project team has worked with dedicated community members and stakeholders to identify the area's priority climate and health concerns, draft relevant strategies for addressing these concerns, and to engage and educate impacted communities.

As the project now enters its third phase, implementation, the project team seeks your input on what climate and health adaptation strategies you would li ke to see prioritized for implementation in your community or organization.

Goals:

1. To prioritize climate and health adaptation objectives that can reduce the impacts of climate change on Marquette County.

2. To consider which objectives and recommendations can be implemented by your community/agency/department/organization(s)' activities.

3. To develop timelines, funding strategies, and opportunities for the implementation of the priority objectives.

These recommendations will inform, as appropriate:

- Community plans and policies
- Design standards and guidelines
- Discretionary guidance is given during the permitting process
- Communications materials and methods

For more information: Marquette Area Climate and Health Adaptation Guidebook (https://superiorwatersheds.org/projects/marquette-area-climate-and-health-adaptation)

AGENDA

Registration

2:30 p.m.: Introduction and MSU Presentation

This includes an overview of current project status, process, findings, and next steps, as well as the format and desired outcomes for today's meeting.

2:50 p.m.: Objective Prioritization

Prioritization Activity: Think about the climate and health concerns of the people you serve. Think in terms of vector awareness, air quality, emergency response/extreme events, and water-related concerns, categories previously identified by the community as priorities. What objectives would you like to see implemented in the community to address those concerns?

The posters around the room contain objectives addressing the climate and health concerns of the community. Using you 8 dot stickers, mark the boxes next to the objectives you would like to see implemented. Be sure to vote at least once per category. Please vote only once per objective.

3:15 p.m.: Small Group/Table Workgroups

Select a table: Please find a seat at a table addressing the category you are most interested in working to implement (Vector Awareness, Air Quality, Emergency Response/Extreme Events, Water-Related).

Implementation activity: Groups should select at least one recommendation corresponding with the top three prioritized objectives for their category. Worksheets at the tables guide the group through key components of implementation.

4:10 p.m.: Group Report Outs, Top Prioritized Objectives, and Corresponding Recommendations

4:40 p.m.: Next Steps, Survey, Project Identification

5:00 p.m.: Meeting Adjourns

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