

## Climate and Health in Maryland:

### The Maryland Climate Change Health Adaptation Program

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#### Abstract

Maryland's response to climate change has included creation of the Maryland Commission on Climate Change in 2007, and initiatives across many State agencies. The Commission coordinates these initiatives through the State Climate Action Plan. The Maryland Department of Health has partnered with the School of Public Health at the University of Maryland College Park to develop the 2016 Climate and Health Profile report, which estimates the health impacts of climate change in Maryland. Using historical health data and climate model projections, the report found that climate change will have a disproportionate impact on certain populations across the state. For example, extreme heat and extreme precipitation events during summer months increased the risk of hospitalization for asthma in Maryland by 22% and 11% respectively. But the extreme heat related risk for asthma hospitalization was more pronounced among non-Hispanic whites (33%) than non-Hispanic blacks (20%). Based on these findings, the Department and School have begun to engage with community organizations and various stakeholders to develop interventions and adaptations aimed at increasing resilience and mitigating some of the health impacts. Through these partnerships and projects, Maryland is using health data, climate projections, and the State Climate Action Plan to assist local communities and regional partners in climate adaptation activities.

#### Background

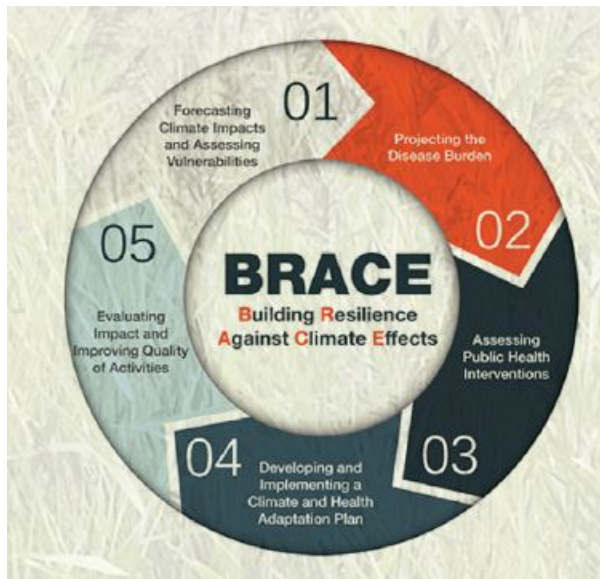
In 2007, Executive Order 01.01.007.07 established the Maryland Commission on Climate Change (MCCC). The Commission was tasked with developing a "Plan of Action to address the drivers and causes of climate change, to prepare for the likely consequences and impacts of climate change to Maryland and to establish firm benchmarks and timetables for implementing the Plan of Action."<sup>1</sup> Initially, the MCCC included representatives from several State agencies, and established three working groups: the Adaptation and Response Working Group (ARWG), Greenhouse Gas and Carbon Mitigation Working Group (MWG), and the Scientific and Technical Working Group (STWG). In 2014 Executive Order 01.01.2014.14 reaffirmed the state's commitment to responding to climate change, expanding the membership and the scope of the MCCC's activities.<sup>2</sup> A fourth workgroup was created, focused on Education, Communication and Outreach (ECO).

Under a cooperative agreement with the U.S. Centers for Disease Control and Prevention (CDC), the Maryland Department of Health (MDH) established the Maryland Climate Change Health Adaptation Program (MCCHAP), which is housed in MDH and operates in partnership with the School of Public Health at the University of Maryland in College Park (UMD-SPH). MCCHAP builds on the previous Maryland Public Health Strategy for Climate Change, which was funded

by the CDC from 2012 to 2016. In 2017, MCCHAP participated in each of the following work groups: ARWG, STWG and ECO. Through engagement with the work groups, MCCHAP is supporting climate and health adaptation activities in Maryland that have been initiated by other State agencies, local communities, and non-governmental organizations (NGOs). These activities are in alignment with the State Climate Action Plan, and the activities supported by the CDC Climate-Ready States and Cities Initiative (CRSCI).

The CRSCI aims to use “prevention expertise to help state and city health departments investigate, prepare for, and respond to the health effects that climate change may have on people.”<sup>3</sup> In the latest round, CDC has funded 16 states and two cities to focus on the impacts of climate and health in their jurisdiction. To assist states and cities, CDC developed and implemented the Building Resilience Against Climate Effects (BRACE) framework (see Figure 1) which provides guidance to grantees to develop strategies and programs designed to minimize the health impacts of climate change.<sup>4</sup>

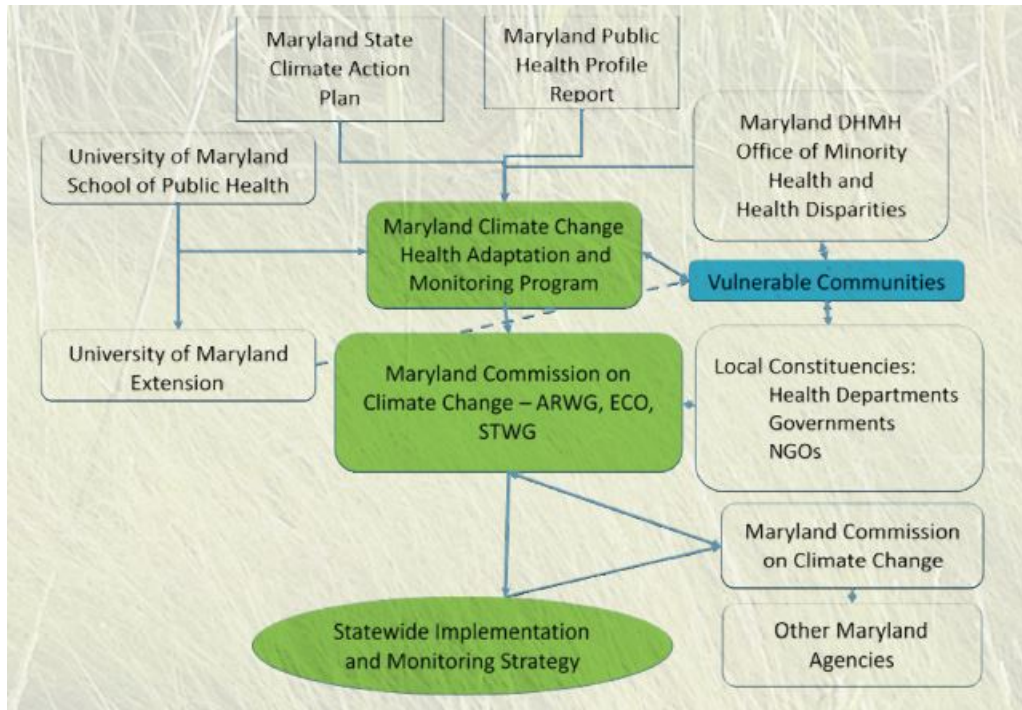
Figure 1. BRACE Framework Developed by the Centers for Disease Control and Prevention



Beginning with the Maryland Public Health Strategy for Climate Change in 2012, MDH has utilized CDC support to integrate a public health focus into the State Climate Action Plan and incorporate public health considerations into Maryland’s ongoing climate change-related activities. MDH and UMD-SPH produced the 2016 Maryland Climate and Health Profile Report,<sup>5</sup> and integrated priority recommendations for human health into the Maryland Climate Plan Phase II Adaptation Report.<sup>6</sup>

Since the release of the Climate and Health Profile Report and the conclusion of first CDC funding period in 2016, MDH has transitioned from an emphasis on quantifying the baseline climate and health impacts in Maryland, to implementation of adaptation activities consistent with the State Climate Action Plan. MDH and UMD-SPH are now focusing on interventions and adaptations tailored to specific community needs and aimed at reducing the identified climate impacts in Maryland. The new MCCHAP, which began in the fall of 2016, is using partnerships with other agencies, the Climate Commission’s working groups, and communities, to identify and support adaptation activities through technical assistance and other approaches (see Figure 2).

Figure 2. Maryland Climate Change Health Adaption Program partnership framework



## Introduction

The Climate and Health Profile Report identified vulnerable populations that are disproportionately impacted by two climate change related exposure metrics: extreme heat and extreme precipitation events. These exposure metrics were chosen because of the increasing body of literature including the most recent National Climate Assessment which concluded that not only are such extreme events becoming more frequent, more intense, and longer lasting, but this trend will continue into the future decades in response to ongoing climate change. The report also illustrated how the projected increases in the frequency of extreme heat and precipitation events will adversely affect the health of Marylanders in future decades (2040). For full methodology see the full report available online via [www.bit.ly/MDCHPR](http://www.bit.ly/MDCHPR). The CHPR analyzed exposure metrics and health data both for the state overall and locally in four pilot jurisdictions: Wicomico County, Washington County, Prince George's County and Baltimore City.

Using hospitalization data from 2002-2012, the report identified how extreme weather related risk of hospitalization for asthma, and heart attack as well as motor vehicle accidents and food-borne/ waterborne diseases, differ across geographic location and population subgroups. For example, extreme heat and extreme precipitation events during summer months increased the risk of hospitalization for asthma in Maryland by 22% and 11% respectively. But the extreme heat related risk of asthma hospitalization was more pronounced among non-Hispanic whites (33%) than non-Hispanic blacks (20%).<sup>7</sup> However, risk of hospitalization for heart attack following exposure to extreme heat event was considerably higher among non-Hispanic blacks (27%) compared to non-Hispanic whites (9%).<sup>8</sup> One of the more striking disparities is related to geography and distance to the coast. Both extreme heat and extreme precipitation were found to

increase risk of Salmonella infection in Maryland with the coastal communities experiencing considerably higher risk (7.1%) compared to non-coastal communities (3.6%).<sup>9</sup>

These findings from historical data were combined with climate projections to estimate disease burdens in future decades (2040), to inform community-specific adaptation strategies designed to protect public health. These projections were then used to qualitatively rank the impacts of these diseases in the future: large impacts (asthma), moderate impacts (heart attack), and small impacts (salmonellosis).<sup>5</sup>

The Climate and Health Profile Report provided an understanding of where vulnerable populations exist within Maryland that are either currently experiencing higher health burdens or are expected to experience higher burdens under projected environmental changes in the state. The report provided the first step to addressing climate change and the subsequent health impacts in Maryland, showing who is likely to be affected, and where adaptive interventions are needed to increase community resilience.

The report also demonstrated that as the impacts from climate change vary across populations, time of year and geographic region, so too must the programming and community engagement be individualized and tailored to be effective. Recognizing this, the MCCHAP team has enlisted a range of partners to help in the development and implementation. The team continually seeks to establish new and strengthen existing partners as a continuous activity under the current programming cycle.

Since the start of CDC CRSCI funding in Maryland, the MDH MCCHAP team has recognized the importance of inter-agency relationships between MDH and other state agencies. These partners include state agencies like Maryland Department of the Environment, Maryland Department of Natural Resources, Maryland Department of Planning, and the MDH Office of Minority Health and Health Disparities, among others. MCCHAP also continues to maintain a strong partnership with UMD-SPH, and has also developed a new relationship with the University of Maryland Extension program. Through its active involvement in MCCC workgroups, MCCHAP has also established formal and informal working relationships with organizations and partners such as the Baltimore Aquarium, the University Of Maryland Center for Environmental Science, Washington College Center for Environment and Society, and the Eastern Shore Land Conservancy. Partnerships with other NGOs have also been explored to establish connections to stakeholders and activities at a local level. One of the most successful mechanisms to engage directly with stakeholders was a one day forum on Building Resilient Communities, which took place in December, 2016. MCCHAP plans to conduct a series of similar forums across the state in 2017 and 2018.

The growing network of partners has allowed the MCCHAP program to support climate and health projects in multiple communities across the state. The projects, some of which are described in greater detail below, include a number of locally initiated and state- wide projects focused on different age groups and populations. They range from an educational program for school aged children in Somerset County on the Eastern Shore of Maryland, to a program to develop leadership opportunities around climate change for high school students in Prince George's County, to a state wide extension programming that reaches extension educators and community health workers (CHW) who work directly with individuals at the local level. The section that follows contains a more detailed description of some of the projects. More

information about all of the projects and their progress is available at [www.bit.ly/mdclimatehealth](http://www.bit.ly/mdclimatehealth).

## Projects

Along with other states supported by CDC's CRSCI program, MCCHAP is developing an Implementation Monitoring Strategy (IMS), a document and framework that describes the adaptive interventions supported by MCCHAP in terms of their location, target populations, evidence base for intervention, progress and impact. Currently in development, the Maryland IMS has a tentative public release date of mid- to late-2018.

Central to the development of both the IMS and the projects it describes is stakeholder feedback and suggestions. Stakeholders are active partners in all stages of the program, and will be critical to the dissemination and updates around climate and health work to the larger Maryland community. The IMS considers project development, implementation strategies and evaluation metrics within both the guidelines of the CDC CRSCI framework and the Maryland State Climate Action Plan. The goal of this dual framework is to ensure that the projects meet both the needs of the communities where they are initiated and the State Climate Action Plan.

Because resources limit the number of projects that can be funded or supported, the IMS seeks to identify the resources, evidence base, and models required for climate and health adaptations to be replicated in other communities, regions, or states seeking to protect human health in the face of climate change. To ensure the evidence base created is accessible to others, once established, the IMS will be displayed online through the Climate Change and Public Health website on the Maryland Department of Health's website, [www.bit.ly/mdclimatehealth](http://www.bit.ly/mdclimatehealth).

On December 9, 2016, the first of the 'Building Resilient Community Stakeholder Forums' was held at the University of Maryland. More than 80 attendees from state agencies, community organizations, NGOs, universities and the faith based community came together to share their experiences. The forum offered a space for community members to share what a path to resiliency means to them, and what difficulties they faced in achieving their goals. The forum provided a two-way exchange of information and perspectives.

The day started with presentations highlighting the work MDH, UMD-SPH and partners completed, including the Climate and Health Profile Report. Following morning presentations, the floor was opened to attendees for discussion around multiple topics.

One of the key questions, "Who is not in the room?" sought to better understand the communities that have not previously been a part of conversations regarding climate change. The day also included a session to allow participants to share personal experience during "stories from communities" and "planning for the changing environment – local perspective." The feedback by and large from the forum was this: continue to identify missing partners and bring them to the table in a meaningful way, increase opportunities for individuals to speak for and represent themselves at all levels of programming and governance, work to continue the discussion and planning towards resilience, and involve everyone from young people, to working age, and senior populations. Following the success of the 2016 forum and at the request of attendees, the MCCHAP is in the process of planning two additional Building Resilient Communities forums in 2017.

The 2017 forums will have a more regional focus, with one forum taking place in Western Maryland and the other on the Eastern Shore.

The MCCHAP team has partnered with a local community hub in Suitland Park, Prince George's County, Maryland. Prince George's county is a jurisdiction that was identified in the Climate and Health Profile Report as at risk of significant health impacts from climate change. Following the 2016 forum, the community hub approached the MCCHAP team to begin discussion around formalizing a partnership.

The conversation led to the decision to develop and implement a Student Climate Ambassador program. This program will empower student leaders to serve as Climate Ambassadors in their classes, schools, and community while educating students on the interconnections between the environment, social and health factors. Ultimately, it is hoped that change will happen under the leadership of the Student Climate Ambassadors. Planning and structuring of the program will occur with input from MCCHAP, school administrators, and students themselves. The programming is planned in three phases: brainstorming, planning & development, and finally implementation.

During brainstorming, the MCCHAP and community hub will develop the Student Climate Ambassador program and ensure the goals and outcomes align with the priorities for the schools, the community and aligns with the CRSCI framework and overall programming goals. Development will include the formalizing of the materials, timeline, evaluation components and implementation plan. Finally, implementation will take place, at the beginning of a semester in both a local middle and a local high school as a pilot semester. For this particular program, distinct phases were necessary to establish and ensure continued progress towards a mutually agreed upon path to meeting the community needs.

MCCHAP has also partnered with the Maryland Department of Natural Resources to support the Shoring Up Resiliency Through Education (SURE) program. This project addresses regional vulnerabilities on the Eastern Shore to climate change and community resilience. The goals of the project will be achieved through partnership with a local public school system and engage elementary, middle and high school students in the experience, study and understanding of local condition trends related to weather and water quality. Currently in the beginning stages of program development, this project provides an opportunity to work with a vulnerable population and educate school age youth around connections between the environment and their health.

While the previous projects are primarily local in scope, MCCHAP's partnership with the University of Maryland Extension (UME) Program is designed to develop and implement climate change training for extension educators and community health workers state-wide. The partnership with UME piggybacks on the community work and established networks of community partnership. UME and MCCHAP have developed content specific to UME educators around climate, health and how it relates to their content topics in their day to day work. Programming has been completed and offered to extension educators during a full day training session in September 2017. Evaluation on the content and method of delivery will be used by team members to improve the program and offer training to more extension educators. A continuous cycle of iteration and refinement will continue with additional trainings offered to achieve training and programmatic goals around climate change content integration into extension programming across the state.

There is strong integration and collaboration between the MCCHAP and other environmental health programs, including the MDH Environmental Public Health Tracking program (MD-EPHT). MD-EPHT originally started in 2003, and provides online environmental and health data, as well as tools and resources for data presentation and analysis. (Maryland Environmental Public Health Tracking, 2017). MD-EPHT is a key tool for community members to access baseline health and environmental data and visualization of their community for environment and health intersections. The tracking portal currently hosts air pollution data associated with PM2.5 and Ozone concentrations in Maryland and is in the process of adding precipitation and heat events. Many of the health impacts presented in the Climate and Health Profile Report are currently on the MD-EPHT portal, including asthma hospitalizations and myocardial infarction.

Others, like salmonella infection and car accidents, are not currently displayed. The current programming provides support to the partnership to display climate indicators such as extreme heat and extreme precipitation events. The MD-EPHT and MCCHAP partnership continues to tackle the intersection of health and environment to provide the most up to date and useful data visualizations to communities to allow programming to be effective.

The ECO workgroup of the Commission identified a gap in communication between climate change activities across the state. Without a central location for climate change events to exist, efforts were being duplicated and experiencing underwhelming attendance. The MCCHAP team, in an effort to address this gap, created and maintains a public calendar: Climate Change, Public and Environmental Health Events in Maryland. This online calendar has become a central resource utilized statewide by MCCHAP and the greater climate change community to track climate and health-related events and activities.

## **Looking Forward**

The discussion of climate change and health has matured in Maryland with the release of the Maryland Climate and Health Profile Report. There is now a recognition of the significant role public health plays in climate change adaptation in the state. MCCHAP, and the strong partnership between MDH, UMD-SPH, and Federal partners, has enabled the state to create tools and resources for local communities in a variety of ways. While there are challenges such as capacity constraints and the diverse array of stakeholders, the strength and success of the program comes from the continued engagement of partners such as individual community members, school leadership and state agency leadership to address these difficulties as they arise in individual projects. MCCHAP utilizes existing partner networks and calls on trusted messengers to participate in all stages of the program. From initial brainstorming, through program development and implementation, to evaluation and program improvement, stakeholders are involved throughout the process for individual smaller scale projects and the overall climate and health endeavor in Maryland. This allows the MCCHAP team to identify, address, and resolve challenges as they occur. It is this collaborative approach that allows climate and health work in Maryland to succeed, and continues to increase community resilience to climate change.

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