

Process Evaluation
“Michigan Climate and Health Adaptation Program (MICHAP)”
2010-2013
Michigan Department of Community Health
Division of Environmental Health

I. Background

In 2009, the Michigan Department of Community Health (MDCH) was awarded a one-year planning grant from the Centers for Disease Control and Prevention (CDC) to develop a strategic plan for responding to public health effects of climate change in Michigan. The planning process involved Michigan's local health departments, University of Michigan, Wayne State University, Michigan State University, and several other state agencies and non-profit organizations. The final strategic plan identified long-term goals, objectives strategies and training developments to prepare public health practitioners at the state and local level to prevent, prepare for, and respond to the health impacts associated with Michigan's changing climate.

In 2010, the MDCH received a three-year grant from the Centers for Disease Control and Prevention (CDC) which funded the MICHAP program to implement the strategic plan as part of a national “Climate-Ready States and Cities Initiative” (CRSCI). MICHAP proposed three specific goals and a variety of strategies to meet the overall goal of preparing for and responding to health impacts of climate change in the state. The funded proposal included a provision for the conduct of a process evaluation at the end of the three years in order to assess program implementation and effectiveness of achievement of early outcomes of the project. The focus of the evaluation was on program implementation (program activities and outputs) as well as early and mid-term outcomes rather than long-term outcomes of the project because it was a new program, based on the logic model for MICHAP (Table 1).

Table 1: Logic Model – MICHAP

Early Activities	Later activities	Early outcomes	Mid-term outcomes	Long-term outcomes
-Develop educational methods for public -Develop training tools for public health (PH) and stakeholders -Develop assessment tools and models (HIA and vulnerability assessments) - ID pilot LHDs** -Identify targets for program integration -ID partnerships	-Do training & education -Do HIAs***: state and pilot LHDs -Map vulnerable populations -Revise LHD EOP**** -Establish structure for partners' input: MDCH and pilot LHDs	-KAB* change: MDCH, LHDs and public. - Revised MDCH emergency response plans -Revised LHD emergency response plans -Revised/new MDCH programs - Partners' input received & documented. -Increased research activity at Universities -LHDs, Partners use materials	- Successful implementation of plans and programs to reduce CC health impacts. -Expanded co-benefits	Reduced morbidity & mortality from CC events - Improved quality of life

* KAB=Knowledge attitudes beliefs; ** LHD=Local Health Department; *** HIA=Health Impact Assessment;**** EOP=Emergency Operations Plan

The evaluation, which was conducted following the close of the third project year, focused on identifying key successes and areas for improvement that could be implemented in the next funding cycle (2013-2016.) The evaluation had two major components:

- (1) An assessment of program implementation;
- (2) An assessment by MICHAP stakeholders and partners of awareness of the issue (climate and health) and of MICHAP's, usefulness, successes and areas for improvement.

In the section II below, the methods and results for the two evaluation components are described. Section III below presents key findings and provides recommendations.

II: Methods and Results

II.A: Assessment of program implementation.

II.A.1 - Methods: The assessment of program implementation addressed specific questions as follows: Did MICHAP carry out the activities proposed in 2010? If some proposed activities were not implemented, why not? Did MICHAP implement activities that were not originally proposed and why? Were there unexpected successes or challenges that occurred over the three-year period?

A number of strategies to obtain answers were used. First, a list of the main activities proposed in the funded grant was compiled and compared to written documents describing program activities, including the final three-year project report to CDC, and information provided by MICHAP staff in interviews and other written materials (e.g. monthly reports). Results were summarized in a table that was reviewed by MICHAP staff for accuracy. Each proposed activity was rated by all MICAHP staff and the evaluator during a meeting on February 11, 2014, using a 1 to 10 scale, with 10 being the most successful.

In addition, successes and challenges were evaluated addressing three administrative areas: staffing (including students), project management, and budget. Information was compiled from written meeting notes, project management tools (e.g. activities milestones/timelines chart, monthly reports), and interviews with MICHAP staff.

II.A.2 - Results:

II.A.2.a - Program activities:

Table 2 describes the major activities of the program and includes a rating of success. It is followed by a description and links to the major products of MICHAP.

Table 2: Objectives, Activities, Accomplishments and Ratings of Success

Objective	Planned Activities	Accomplishments	Unplanned activities/ accomplishments	Comments	Rating of success: 1 (least) to 10 (most successful)
1.1 MDCH support for CC	<ul style="list-style-type: none"> -Educate MDCH management and staff – oral presentations and written outreach. -Effect two program or policy changes within MDCH. 	<ul style="list-style-type: none"> -Delivered presentations on MICHAP/ climate change and health to MDCH and PHA senior staff and Directors, other programs outside of BoE (e.g. Office of Public Health Preparedness; Bureau of Family, Maternal and Child Health, Chronic Diseases Division). -Published monthly articles in DCH News and Notes which reaches all DCH employees. -Instituted annual extreme weather surveillance (extreme heat and cold, carbon monoxide) in collaboration with Regional Epidemiologists. - Developed guidelines and procedures for MDCH to respond to natural disasters (tornadoes, winter storms, floods, wildfires, extreme heat) 	<ul style="list-style-type: none"> -Partnered with MDCH Bureau of Family & Material Child Health Division to develop educational materials on child safety in hot weather; materials were distributed thru WIC and Injury Control's Car Seat Technician program. -Partnered with Chronic Diseases' "Healthy Communities" in Yr1 to build climate adaptation activities into their existing program structure, present at their meetings, etc. 	<p>The program delivered a number of presentations to MDCH management and staff, which were well received. Awareness of the issue and MICHAP led to a number of additional invitations (e.g. presenting at the annual Michigan Homeland Security conference). These led to increased collaborations with the Communicable Disease Division (vector-borne diseases and heat surveillance); Maternal Child & Infant Health; Office of Public Information (press releases.). Evidence of impacts on specific programmatic activities included health surveillance outputs and health education materials.</p> <p>-Unfortunately the Healthy Communities program lost funding so we weren't able to partner with that part of PHA after 2011.</p>	9
1.2 Training/education for public health	<ul style="list-style-type: none"> -Develop/ implement trainings for local and state staff. in-person, web-based, -Educational materials for MDCH newsletters. 	<ul style="list-style-type: none"> - Conducted survey of LHD on training needs. -Sponsored 2-day HIA training (see below 2.1-2) -Delivered on-line/in-person public health Grand Rounds reaching 100, in collaboration with U. Michigan (UM); posted on-line for others. -Delivered 22 presentations by MICHAP at professional 	<ul style="list-style-type: none"> -Developed heat and health curriculum in partnership with UM; included a Facilitator's guide and scripted power point presentation. - Curriculum posted to the NACCHO public health toolbox. 	<p>The program delivered numerous high quality products and services related to training and education of public health professionals at MDCH, LHDs, universities and nationally. Never turned down opportunities for presenting.</p>	10

<p>1.3/1.4 Training /education for public/partners</p>	<p>-Provide public education materials to LHDs, partner organizations, and for public, including posting on MDCH web</p>	<p>meetings in Michigan and nationally. - Participated in multiple webinars and professional development seminars/trainings. - Provided multiple environment/climate-related articles for MDCH newsletters, including MICHAP newsletter. - Developed MICHAP website and populated with public education fact sheets/flyers plus multiple links to other materials and programs. -Developed 14 MDCH press releases with health advisories related to weather -Delivered presentations, PSAs, social media postings, TV station interviews, other outreach on heat, (with focus on Detroit). -Provided articles for other professional newsletters (e.g. Association of Planners and Michigan Public Health Association). -Developed curriculum for educating community leaders on heat and health; delivered curriculum through workshops at 3 Detroit agencies.</p>	<p>Delivered climate and health training to planners during spring 2011 MAP symposium, and in spring 2013 to community as part of LIAA/Resilient Monroe project.</p>	<p>The program delivered numerous high quality products and services related to training and education of the public and non-public health partners/interest groups</p>	<p>10</p>
<p>2.1/2.2 Health impact assessments (HIA)for CC-related topics</p>	<p>-Provide training on HIA to LHD - --Foster LHD HIA development. (focus on heat and air pollution)</p>	<p>-Provided 2-day LDH training. -Funded HIA in 2 communities. -Conducted 1 HIA. -Developed HIA fact sheet and posted on MICHAP website</p>	<p>-Formed the Michigan HIA Network that included HIA practitioners from the University of Michigan, Ingham County Health Dept, Muskegon County Health Dept, and MICHAP. -Provided an HIA presentation to UM students and select</p>	<p>-Trainings and 3 HIA experiences highly rated by all involved. -Staff work in conducting the Ann Arbor HIA was quite instructive; it was the first time we had experience in applying the training. However, it took much longer than anticipated, both because of our inexperience and due to turnover in staff to provide epidemiologic support to the assessment</p>	<p>9</p>

	<p>phase. In addition this was the first opportunity we had to apply GIS to a vulnerability assessment, another learning curve. (see also 3.4)</p>		<p>staff; provided technical assistance on 1 HIA conducted by students. - Attended 2 National HIA meetings with a scholarship received from Health Impact Project. - Served on the Advisory Board for 2 HIAs conducted by Ingham County Health Dept.</p>		9
<p>2.3 Public health emergency plans include CC/PH</p>	<p>-Completed MDCH natural disasters plan. -Reviewed local LHD plans to assess extent that natural disasters and vulnerabilities were included. -Materials developed for the MDCH plan, were designed to be/ were made available to LHDs for their use.</p>	<p>1.CASPER (Community Assessment for Public Health Emergency Response) - Organized trainings for MDCH and LHD on CDC CASPER methodology for assessing public health needs following a disaster. - Supported conduct of a CASPER in Oakland County. - Developed plan/tools for a heat wave CASPER, to be used if needed. 2.Natural disasters response: Heat wave summer 2012 -Tracked impacts of heat wave using MDCH syndromic surveillance (see 3.4 below) -Hosted after-action with LHDs on LHD response to heat wave.</p>	<p>-Discovered and explored a number of new and disparate websites that contained information relevant to CC related surveillance; the most promising (eg, EPHTN, NRDC) were explored for relevance and ideas.</p>	<p>-Data sources assessment: Not completed as formal process due to staff issues and competing priority of completing Indicators; was begun as part of the process of developing the MI climate change Indicators report. -MI Indicators report: Not completed until December 2013 due to staff turnover, collection of data for multiple years rather than one, and discovery of many challenges in applying the CSTE climate change methodology. Experience will be helpful when doing the profile report in the new funding period.</p>	6
<p>2.4 Surveillance systems for CC-related indicators</p>	<p>-Complete MDCH natural disasters emergency plan. -- Promote natural disasters planning in LHDs.</p>	<p>-Developed draft protocol and template for compiling info on surveillance data sources - Provided MI Indicator data and feedback for CSTE climate change Indicator pilot. -Analyzed MI data and developed MDCH climate change Indicator report based on modified CSTE Indicator methodology.</p>	<p>-Assess data sources for surveillance -Generate Michigan data for CSTE climate change Indicators</p>		

<p>2.5 Integration of state and local CC-related activities</p>	<p>-Identify relevant programs -Work with programs to identify adaptation activities and co-benefits</p>	<p>-Worked with Detroit-based environmental justice groups (e.g., Detroit Climate Action Collaborative, Metro Detroit Climate Justice Task Force. - Worked with Michigan Association of Planning on training and outreach to municipal planners; - Worked with Land Information Access Association (LIAA) to incorporate public health into inter-jurisdictional climate resiliency planning. - In Year 1, worked with DEQ's Pollution Prevention program to offer training and TA to communities conducting local climate and resiliency planning; several P2-funded communities participated in HIA training and 1 submitted for HIA funding.</p>	<p>-Partnered with LIAA on a grant proposal to APHA & Kresge Foundation. -Funded work bringing the LHD into Monroe County's regional resiliency planning project. - Provided public health expertise, data and technical assistance to LIAA and LHDs for master planning. - In partnership with UM coordinated health education and outreach activities for summer safety in Detroit targeting senior citizens (e.g. distributed heat safety materials at Senior Olympics, through Meals on Wheels Program and senior sites in collaboration with Detroit Area Agency on Aging, (DAAA). - Prompted DAAA to add air conditioner question to questionnaire for senior citizens participating in the Meals on wheels program administered during in-home visits by social worker. - As part of development of Detroit's first climate action plan, chaired Public Health Workgroup; drafted public health section for climate action plan.</p>	<p>- Many new, unanticipated partnerships at local level led to a variety of activities related to climate change adaptation, particularly in Detroit which has a large number of people with vulnerabilities potentially impacted by climate change.</p>	<p>10</p>
<p>2.6 Adaptation tool kit</p>	<p>-Compile and disseminate literature on effective adaptation strategies</p>	<p>Not done as a formal process, however partially done as part of other projects: HIA, the I-Heat and MMHM pilots, heat surveys,</p>	<p></p>	<p>This goal was lagged into the next funding period due to lack of resources, competing priorities and MICHAP's inexperience</p>	<p>4</p>
<p>2.7 CC/PH infrastructure</p>	<p>-Develop/maintain/utilize groups of</p>	<p>--Formed MICHAP Advisory Committee (N=12); met once and used to review</p>	<p></p>	<p>Initial partners identified during the ASTHO-funded planning grant led to the formation of the Advisory Committee, and contacts there</p>	<p>9</p>

	<p>partners</p>	<p>materials. - See above #2.5 for many activities related to this objective. In addition: - Funded student interns from U of M and MSU on a variety of climate-change related epidemiology projects in collaboration with students' mentors. - Provided data and technical assistance for UM and MSU faculty working on heat-related epidemiology projects. Products included: GLISA final report and NIH grant proposal including I-Heat tool development. - Built partnerships with scientific (e.g. NOAA, GLISA) and planning organizations; provided input into a NOAA book chapter.</p>		<p>led to a variety of collaborations with Universities, groups not traditionally focused on public health, and individuals involved in the scientific aspects of weather and climate. These partnerships and related outputs were viewed as one of the strongest aspects of MICHAP.</p>
<p>3.1 Vulnerable populations training</p>	<p>- Develop/ implement training on vulnerable populations and climate change/ health - Ensure that MICHAP educational materials are culturally sensitive</p>	<p>- All presentations and trainings contained content about vulnerable populations, the heat and health curriculum.</p>		<p>8</p>
<p>3.2 Culturally sensitive educational materials</p>		<p>-Materials developed with a structure to match interventions and messaging to target audiences by considering place, education level, language, social and psychological factors, and culture. - Fact sheets, newsletter and articles and press releases reviewed by MDCH health promotion experts and public information officer to ensure</p>	<p>Ingham County Health Department used heat materials and translated them into Spanish</p>	<p>9</p>

<p>3.3. Vulnerability assessment</p>	<p>-Develop/ disseminate tools to assess population vulnerable to climate change health outcomes</p>	<p>culture sensitivity prior to dissemination. -Assisted in developing/piloting heat decision tools developed by U of M ("I-Heat") and MSU ("Mid-Michigan Heat Model-MMHM"). - Funded/provided technical support to two LHDs to do heat vulnerability assessment surveys of residents. -Contracted for heat vulnerability report with maps prepared and posted on-line. -Contributed to vulnerability assessments in Monroe with LIAA, and as part of Ann Arbor HIA.</p>	<p>- Participated in design of on-line tool: "Socioeconomics and climate change in the Great Lakes region".</p>	<p>-Development of a useful and feasible approach to vulnerability assessment related to climate and health was challenging. MICHAP learned through the project activities and will be able to apply these results to the next grant phase. Pilot work on I-Heat and MMHM was promising and results were used to apply for funding for further development of these tools.</p>	<p>7</p>
<p>3.4 Surveillance for high risk populations for climate change health effects</p>	<p>- Use health data sources and GIS to generate health data focused on high-vulnerability populations.</p>	<p>- Developed heat vulnerability report, including county-level vulnerability maps. -Developed capacity and knowledge-base to use MDCH syndromic surveillance for climate-related health outcomes; implemented for heat waves as noted in section 2.3 above.</p>	<p>- Masters epi students completed two analytical projects related to heat and health outcomes; both are being prepared for publication: 1. Ogbomo AS et al. "Excess hospitalizations for heat-related illness, cardiovascular, respiratory and renal disease for extreme heat wave periods in three Michigan counties." 2. Yang AJ et al. "Association between high temperature and preterm birth in Detroit."</p>	<p>- The heat syndromic surveillance was highly successful in identifying impacts of heat on ED visits and was used to support public health messaging. -Measurement of heat-event related morbidity and mortality in our state has been complicated by the lack of a standard approach or definition of exposure; work on this will continue into the new grant cycle. -Development of epidemiologic support/capacity/products was challenged by staff turnover, lack of expertise in GIS, and lack of clarity about goals and appropriate strategies and products.</p>	<p>7</p>

Links to major products of the program are as follows:

- Two complex technical documents by MICHAP staff
 - Smith D, Wirth J, Cameron L, Kutch L, Skorokhod V, Stanbury M. Expanding urban tree canopy as a community health climate adaptation strategy: A Health Impact Assessment for the Ann Arbor Urban & Community Forest Management Plan. January 2014. Available at http://www.michigan.gov/documents/mdch/Final_January_2014_HIA_446372_7.pdf
 - Cameron C, Wahl R, Waterbury B, Konowech RW, Stanbury M, Smith D. Indicators of the potential effects of climate change on public health: Michigan results, 2011. MDCH report December 2013. Available at http://www.michigan.gov/documents/mdch/MI_Climate_Change_Indicators_2013_443695_7.pdf
- Five reports under contract with other agencies:
 - Seroka C, Kaiser P, Heany J. Mapping Health Vulnerability in Michigan: MPH Annual Report. September 2011. Available at http://www.michigan.gov/documents/mdch/Heat_Mapping_FY11_Final_Report_9.30.11_433139_7.pdf
 - Cerniglia SR, Parsons A. Washtenaw County Public Health Hot Weather and Health: 2011 Survey results. Available at http://www.ewashtenaw.org/government/departments/public_health/emergency_preparedness/heat/full-results-heat-survey-2011
 - Ingham County Health Department. 2011 Ingham County Hot Weather and Health Survey Report. Available at <http://hd.ingham.org/Portals/HD/Home/Documents/heat/2011InghamHotWeatherHealthReport.pdf>
 - Public Sector Consultants Inc. A Health Impact Assessment of Non-motorized Transportation Improvements in East Lansing. December 2012. Available at <http://www.healthimpactproject.org/resources/document/East-Lansing-Climate-and-Non-Motorized-Transportation-Plan-HIA-Final-12-18.pdf>
 - Public Sector Consultants Inc. Michigan Street Corridor Plan: A Health Impact Assessment (for the City of Grand Rapids). December 2012. Available at <http://www.healthimpactproject.org/resources/document/Michigan-Street-Corridor-Plan.pdf>

- Production of a wide variety of public education materials, newsletters, training materials and other tools about climate and health: Available at www.michigan.gov/climateandhealth.

II.A.2. b - Program administration:

II.A.2b.i - Staffing

Table 3a: Staff with roles and responsibilities; time on project

Staff	Role/% time/duration	Responsibilities
Lorri Cameron, PhD	Principal Investigator. 50%.* Entire project period.	Overall direction and management of MICHAP; build program support thru outreach to partners; student mentor; review/input to staff work
Dominic Smith, MSA	Project coordinator/ health educator. 100% 2/2011 thru end of project period.	Lead health educator and program implementation coordinator;
Martha Stanbury, MSPH	Program coordination. 5%.* Entire project period.	Liaison with emergency preparedness in MDCH, program evaluation, administrative support
Robert Wahl, DVM, MS	Project Epidemiologist. 70% 9/2010 thru 1/2011; 50% 2/2011 thru 9/2012.	Developing and producing health and environmental data summaries, including data for Indicators and maps; supervisor for students; epi support.
Bethany Waterbury, DVM	Epidemiologist. 75%. 1/2012 thru-7/2012.	Compiling data and report on climate change Indicators. Epidemiologic analysis for Tree Canopy HIA. Compiling information on climate and health surveillance data sources?
Julie Wirth, PhD, MS	Project Epidemiologist. 50%. 10/2012 thru end of project period.	Developing and producing health and environmental data summaries, including the Tree Canopy Health Impact Assessment; review of data sources.
Libbey Kutch, MS, PhD (cand)	45% FTE 1/2013 thru 7/2013	Tree Canopy HIA data analysis/mapping; population vulnerability assessment/ mapping; general epi support
Tom Largo, MPH	Epidemiologist. 37%FTE 6/2012 thru end of project period.	Review of data sources general epi support

* In-kind.

Table 3b: Student support, time on project, activities

Student	% time; Project period	Activities
Rob Kononowech, MPH, PhD (cand)*	Epi student support 20% FTE 5/2011 thru 12/2011	Climate change Indicators data analysis/summary.
Adesuwa Ogbomo, MD*	Epi MPH intern 80% FTE 5/2011 thru 8/2011	Assisted with 2 LHD heat and health surveys. Analyzed hospital data looking at heat related outcomes.
Alyssa Yang*	Epi MPH intern 100% FTE 5/2012-thru 7/2012.	Analysis of data on heat and adverse birth outcomes. Assisted with CASPER heat toolkit, Literature review for Tree Canopy HIA
Tess Gallagher*	Epi MPH intern 100% FTE 5/2011 thru 8/2011	Survey data collection and entry in support of MSU "dynamic modeling" project on impacts of heat on human health
Bethany Waterbury, DVM, MS (cand)	Paid Epi intern 4/2011 thru 9/2011	Climate Change Indicators data collection/analysis and report writing
Peter Koh, MS, PhD (cand)	Geography student assistant 37% FTE 3/2013 thru 8/2013	Literature review, summary report: climate models and forecasting methods, in general and applied to MI

*Students of academic partner Marie O'Neill, University of Michigan

Notably, the PI (LC) and project consultant (MS) were with the project throughout the funding period, and the Project Manager (DS) was with the project in its entirety starting six months into the funding period. This provided stability and consistency during the implementation of a project that, by all accounts, involved a steep learning curve.

Involvement of students from U of M and MSU had a number of benefits even beyond the completion of work assigned by MICHAP. For the students, their MICHAP projects in some cases were also used to fulfill their educational requirements. At the same time, MICHAP developed relationships with the students' mentors at their universities and those relationships resulted to additional collaborations.

The turnover in epidemiology staff hindered consistency and timely completion of products involving epidemiologic analysis and report writing.

II.A.2b.ii - Project management

Project management was conducted primarily using weekly in-person meetings of MICHAP staff to discuss progress and future activities. The discussion was usually guided by reference to a written timeline of project activities based on the grant proposal, which was updated periodically by the Project Manager. Staff took notes during the updates but formal minutes were not prepared. There were periodic efforts to have

staff complete written monthly reports of the past month's accomplishments and subsequent month's planned activities, but most staff did not do these. The Project Manager kept detailed records of progress and completion of projects, which were then used in program reports to CDC

Shortly after the Project Manager was hired, project management was tracked through the use of a project scheduling chart and in-person meetings; however it had to be modified frequently because deadlines were often pushed back. This was at least in part because the program was new and unfamiliar, because it involved a new scientific domain (weather and climate) with its own body of literature, and because of reliance on part time staff and a succession of student assistants to complete some of the major activities. This process would likely have been more protracted without having a set of partners identified and a strategic plan in place, which took place during the ASTHO planning grant.

"This is such a big issue... overwhelming. Our program struggled to get our arms around the issue...so much that is new."

Dr. Cameron, the Principal Investigator, did not have direct supervisory responsibility for two of the senior staff on the project. Both of them had competing responsibilities, which resulted in some challenges to project management.

II.A.2b.iii – Budget:

Methods: Proposed and revised budgets and final year-end budget reports were reviewed to identify amounts budgeted and spent in each of the three years. Unspent funds in the first and second years that were rolled forward in subsequent years were identified. Funds were grouped into three categories: staff (MDCH and staff employed by other including MPH and MSU with funding from MICHAP), contracts to other organizations for activities (e.g. heat and health surveys, HIAs, training), and all other administrative costs, including travel, training, equipment, IT, indirect, "random moment", printing, etc.

Results: Table 4 summarizes budget allocations and expenditures for the three year period, and is followed by notes with comments on changes to allocations.

Table 4: Budget allocations and expenditures: 2010- 2013.

Budget category (in \$K)	Year 1 allocated	Year 1 expended	Year 2 allocated	Year 2 expended	Year 3 allocated	Year3 expended
MDCH salary, fringe	79	79	94*	77*	73	17***
Indirect	6	6	7	5	4	2
Contract salary, fringe, etc.	125	83**	90	116*	139	175***
Contracts						-
HIA training		19**				-
Heat Vulnerability report	4.5	13**				-
2 heat health surveys	4.5	24**				-
2 HIAs			30	22****	8	8
Training and report: LIAA						7***
All other costs	16	11	14	15	11	26***
Total: CDC budget	235	235	235	235	235	235

* Additional epidemiology support from an MDCH employee was planned for year 2, but the MDCH employee was assigned to other projects, thus funds were reallocated for additional contract epidemiology support.

**The contract Project Coordinator was not hired until about 6 months into the budget year; funds were reallocated to support contracts as noted.

*** Because the MDCH epidemiologist took another position in MDCH, funds in year 3 were reallocated to contract staff for part time epidemiology support and (1) to a contract with the "Land Information Access Association" for training and a report, (2) to MDCH Vital Records for support in accessing health data, and (3) to MDCH communicable Disease for printing a vector borne disease brochure.

**** Funding for one of the two HIAs was reallocated to be split between year 2 and year 3 because of a delay in startup.

Notably, anticipated unexpended funds were promptly reallocated, generally to support additional student support or contracts for products, so that all funds were expended by the end of the three-year project period in ways that supported project goals.

II.B - Input from stakeholders and partners:

II.B.1 - Methods:

Information was obtained in three ways from stakeholders outside of MICHAP staff: (1) a written survey of Local Health Departments that was emailed to health officers, environmental health (EH) directors, regional epidemiologists and Emergency Preparedness Coordinators at the 45 local health departments plus contacts 11 contacts in tribal health, (2) a written survey emailed to a list of MICHAP partners that the program had been building throughout the project period (N=36), and interviews of 5

MDCH non-MICHAP staff. Information was solicited about: knowledge about climate change, activities that have promoted climate change awareness and adaptation, awareness and utilization of MICHAP products and expertise, recommendations to MICHAP, and interests in future products and support from MICHAP.

Representatives of two organizations that successfully competed for small grants from MICHAP for to conduct community surveys about heat and health awareness/preparedness and two organizations that receiving funding from MICHAP to conduct HIAs were interviewed about the successes and challenges of their projects.

II.B.2 – Results:

II.B.2.a - Local Health Department survey

Forty-three completed responses were received, representing 34 (76%) of Michigan's 45 local health departments, plus one tribal health center. The respondents included 12 (28%) health officers, 12 (28%) EH directors, 14 (33%) Emergency Preparedness Coordinators, and 5 (12%) others.

Highlights from the results are as follows:

In response to questions about climate change/public health knowledge and the respondent's department's related programs:

- 75% agreed or strongly agreed that climate change is happening and 88% felt they were knowledgeable about the public health impacts of climate change. Less than half (49%) agreed that their jurisdiction is likely to experience public health impacts of climate change in the next 20 years.
- 61% said their department currently had activities related to climate change.
- 18% expected that their department would be initiating climate change-related activities in the next few years, and 65% indicated they did not know if climate change activities would be initiated.
- Only 5% indicated that climate change was among its department's top ten priorities.

In response to questions about interactions with the MICHAP program:

- 26% recalled receiving materials from MICHAP on training and 26% participated in trainings.
- 37% recalled receiving public education materials from MICHAP and 40% of those who received them used them in their programs.

- 16% recalled other interactions with MICHAP (e.g. attendance at a conference, received a training needs assessment survey).
- 69% of those recalling any of these interactions rated them as “excellent” or “good”.

Recommendations for improvements from five respondents to an open-ended question included:

- “I just recently got hired as a contract employee for the [local health department] as the Emergency Preparedness Planner. My education is in Urban and Regional Planning w/ a minor in GIS. I also know quite a bit about Horticulture/Landscaping/Environmental. If I can be of any assistance, please let me know.
- MICHAP should collaborate with Emergency Response Planning
- Can we shift the focus from adaptation to prevention?
- This is the first that I have heard of this program.
- Did not know your grant and program existed. MDCH lives in a bubble.”

Of the 41 that answered the question about how MICHAP could support their department in the future with various categories of assistance, the largest majority identified an interest in written materials (range: 64% to 86% depending on the type of material), followed by 37% to 59% that identified “technical assistance”, with the largest percent identifying technical assistance with “projecting future climate change scenarios in your jurisdiction”.

II.B.2.b - MICHAP partner survey:

Of the 36 partners emailed the survey, 15 (42%) responded, including 3 (20%) in city planning/development, five (33%) in academia, 1(6%) in weather-related federal agencies, 2(13%) in advocacy non-profits, and 4 (27%) from Michigan governmental organizations.

In response to questions about climate change/public health knowledge and the respondent’s organization’s related programs:

- 100% agreed or strongly agreed that climate change is happening, that it will impact on public health in the next 20 years, and that they are knowledgeable about the issue.
- 73% indicated that their organization has activities related to climate change, and 49% expect that their organization will be initiating related activities in the next few years.

- 33% indicated that public health/climate change is among their organization’s top 10 priorities.

In response to questions about interactions with the MICHAP program:

- 67% recalled receiving training announcements from MICHAP and 58% indicated that they or someone from their organization participated in one or more of these trainings.
- 60% recalled receiving public education materials from MICHAP and 46% of those who received them used them in their programs.
- 11 (92%) of the 12 who responded to the question about the quality of MICHAP materials and services, ranked them as excellent or good, and 1 had no opinion.

Recommendations for improvement from four respondents to an open-ended question included:

- “It would be very helpful if MDCH could continue to provide financial assistance to their key partners as needed.
- Keep it up!
- More of these workshops and training sessions are needed.
- Partner with Michigan Green Communities to engage this network of sustainable local governments around public health and climate change.”

Of the 14 that answered the question about how MICHAP could support their department in the future with various categories of assistance, the largest majority identified an interest in written materials (range: 69% to 100% depending on the type of material), followed by “technical assistance”, with the largest percent identifying technical assistance with performing Health Impact Assessments (77%) and policy development (76%). 41% to 68% were interested in training, particularly in climate change strategic planning.

II.B.2.c - Interview with MDCH non-MICHAP staff:

The five MDCH non-MICHAP staff who were interviewed included two in MDCH’s Office of Public Health Preparedness, and three senior managers in Public Health Administration. Results are summarized in Table 5.

Table 5: Observations and recommendations from MDCH non-MICHAP interviewed staff

Issue	Responses
Is climate change a public	All said yes. Specific impacts that were noted: heat illness, impacts on food and water supply, increased disease vectors, impacts on

health issue?	infrastructure and vulnerable populations from extreme weather.
Has your awareness of climate and health changed in past four years?	All said yes. Noted that it is more in the news; evident just based on recent weather (hotter, less snow); more literature available.
What do you know about the MICHAP program?	One was aware of the overall project not able to cite any specific aspect of the program. The other four cited at least one aspect of the project, including: aware of work with local health departments, HIA, public education, emergency preparedness; read MICHAP materials; attended MICHAP presentations.
Have you been at venues where you have promoted climate change issues?	Three of the four asked this question said yes, noting: "I always talk about it!" "People are always asking me about this"
What do you think are the most significant accomplishments of MICHAP and why?	Two of the four asked this question had no opinion. The others noted: <ul style="list-style-type: none"> • Outreach to local communities/agencies, partnerships, the Tree Canopy HIA, • MICHAP staff and building of partnerships noted as key to these successes.
What factors have limited the success of MICHAP?	Two of the four asked this question had no opinion. The others noted: <ul style="list-style-type: none"> • Not enough funding. • "Political climate" that doesn't promote programs to address the problem. • It has taken time to figure out how to do this program. • "Need to be stronger on the science of climate change; convey and promote the science."
Recommendations for the next funding period?	One of the four asked this question had no opinion. The others noted: <ul style="list-style-type: none"> • Promote the science of climate change. • We need to move beyond adaptation to mitigation. This is a problem that will be bigger than obesity or health care reform. • Make sure local health departments have good natural disaster emergency response plans in place. • Engage MDCH Director. • Continue being a catalyst for awareness: "We can't understand all the ramifications of the butterfly effect". • Get word of the program out to more MDCH and public health partner staff using newsletters etc.

II.B.2.d - Interviews with funding recipients.

II.B.2.d.i - "Heat and Health community surveys": Table 6 summarizes responses from one staff involved in each of two community surveys

Table 6: Responses of staff who participated in community surveys.

Question	Response summary
Did the project achieve its goals; what activities /programs were initiated as a result?	<p>Both said yes. Survey results:</p> <ul style="list-style-type: none"> • Showed what was going on the in community. • Demonstrated how more resilient rural communities are than urban. • Contributed to development of LHD extreme heat response plan. • Informed development of public education to improve readiness and target vulnerable groups. • Used to inform environmental initiatives and used as part of an HIA.
Were there other useful outcomes from doing the survey?	<ul style="list-style-type: none"> • Updated heat readiness materials. • Formed new partnerships • Improved LDH response plans, website, social media plans, utilization of health surveillance data.
Was funding adequate?	<ul style="list-style-type: none"> • No, projects cost more than double what MICHAP funded (\$25,000-\$30,000 rather than \$12,000). • Difference was made up by in-kind, interns, help from MDCH, support from Preparedness program.
Suggestions for the future	<ul style="list-style-type: none"> • Make LHDs and emergency management connect over the heat/health issue. • Should repeat survey annually to see if progress is being made. • Have funding from MDCH for Preparedness include requirement to address climate change.

II.B.2.d.ii - Health Impact Assessments: Table 7 summarizes results of responses from three staff involved in two communities.

Table 7: Responses from HIA-funded staff

Question	Response summary
How learned about funding	All had attended the MICHAP-sponsored HIA training taught by

availability?	Human Impact Partners
Was the process of completing the HIA straightforward?	<p>Yes from a planning and implementation perspective. But challenges included:</p> <ul style="list-style-type: none"> • Timing of results in relation to incorporation of results into broader project. • Insufficient funds to collect primary data; had to rely on secondary data. • Took a while for others (e.g. land use team) to understand importance of HIA – a learning curve.
Did the HIA accomplish its goals?	<p>Yes. The HIA:</p> <ul style="list-style-type: none"> • Became major component of the process. • Big part in shaping elements of the 3 urban development scenarios under consideration. • Had direct impact on approving parts of the bigger proposed plan. <p>But :</p> <ul style="list-style-type: none"> • Had some issues with buy-in and support from the city. • Wished they had time/resources to do integrate into community; do more public education
Were there any negative outcomes?	No
Was funding adequate?	Was enough for a rapid HIA, but more funds would have allowed for better data collection and more community engagement.
What additional assistance would be needed to do HIAs in future?	<ul style="list-style-type: none"> • More training, including training on data acquisition and analysis. • Provision of a toolbox of data • Technical assistance from Human Impact Partners and MDCH

III: Findings summary and recommendations for the future

Findings - Successes and challenges: MICHAP had many successes in its first three years, helped in part by the one-year planning grant from ASTHO to develop a strategic plan. Most of its major goals were accomplished and many unanticipated outcomes provided added value. Chief among these successes were:

- Recognition and increased awareness of the issue among Local Health Department staff and dissemination of tools such as HIA.

- Engagement of public health in domains not traditionally engaged by public health, including climate science, community planning and advocacy, and university disciplines outside of public health.
- Development and dissemination of two major technical reports by MICHAP staff and contracts for five other reports.
- Development of a wide variety of public education, training, and other materials
- Expansion of environmental health surveillance, in partnership with communicable disease surveillance, to track health impacts of severe weather events.
- Expansion of MDCH's environmental health preparedness plans to include plans for natural disasters.
- Development of a trained and knowledgeable set of subject matter experts within MDCH who have been catalysts and resources for the development of climate and health activities in the State.

Some of the reasons for these successes can be attributed to:

- Initiation of the program occurring at a time of escalating awareness and concern about global warming.
- Several recent seminal publications providing the intellectual foundation and rationale for public health and climate change adaptation.
- A climate and health strategic plan completed, with input from many partners, just before Year One.
- Support for the program within MDCH.
- A highly competent and motivated Project Manager hired soon after funding was awarded.

Several areas were not deemed as successful as areas identified above, including:

- Two major projects were not completed until long after they had been scheduled, including the Indicators report and, to a lesser degree, the Tree Canopy Health Impact Assessment.
- Two objectives associated with health surveillance were not completed, including an assessment of data sources for surveillance, and surveillance using GIS and focused on vulnerable projects.

These projects foundered in part because of inconsistent epidemiologic support from part time staff and a succession of temporary student support. In addition, they also were challenged by the fact that the science of climate change health surveillance is in its early development. Thus for example, staff discovered various flaws and challenges

when attempting to apply the CSTE Indicator methodology to Michigan data. Finally, the scientific support for the complex links between long term changes in climate and health outcomes is evolving quickly, but is not mature at this point.

Recommendations for the next funding cycle – 2013-2016. The many accomplishments of MICHAP leave the program well prepared for this next funding cycle. Notably new in this funding cycle is the requirement for implementation of the CDC BRACE¹ framework and this poses opportunities and challenges. Recommendations moving forward are as follows:

- Although implementation the first three of the five steps of the BRACE framework is focused primarily on acquisition of information and production of reports, MICHAP should actively maintain and promote links with partners and community groups to encourage local awareness and activity around climate change adaptation and health.
- More epidemiologic input will be required for timely completion of high quality reports in steps 1 and 2 of BRACE.
- Provide close monitoring of delays and barriers in maintaining timelines for completing BRACE products, and implement concrete corrective actions.
- Ensure that BRACE products are used for on-going tracking of impacts of climate on health in Michigan and to generate interventions to mitigate those impacts.
- Develop and implement quantitative and qualitative systems to track the impacts of MICHAP products, technical assistance, and participation in activities in local jurisdictions (e.g. numbers of web hits, keeping sign-in sheets at events, soliciting feedback on MICHAP documents).

Respectfully submitted

Martha Stanbury, MSPH
March 2014

¹ CDC's Building Resiliency Against Climate Effects (BRACE) framework.
<http://www.cdc.gov/climateandhealth/BRACE.htm>