

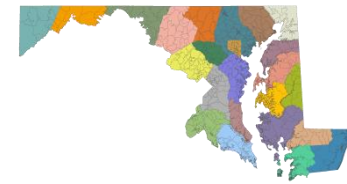
***2018 LOCAL SOLUTIONS: EASTERN CLIMATE  
PREPAREDNESS CONFERENCE***

# **TAKING THE DRAMA OUT OF TRAUMA: CLIMATE CHANGE AND MENTAL HEALTH**

**Clifford S. Mitchell, MS, MD, MPH  
Director, Environmental Health Bureau**

May 1, 2018

Manchester, New Hampshire



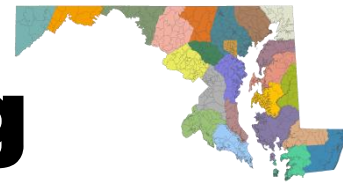
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# Maryland's Public Health Strategy for Climate Change



# Climate Change Planning in Maryland

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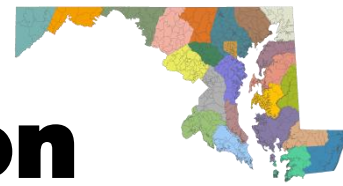


## ➤ Maryland Climate Change Commission

- ❖ Advisory commission to Governor and General Assembly
- ❖ Aimed to mitigate the causes of, prepare for, and adapt to the consequences of climate change
- ❖ All while maintaining and strengthening the State's existing Greenhouse Gas Reduction Plan.
- ❖ Work Groups:
  - Mitigation Working Group (MWG)
  - Adaptation and Response Working Group (ARWG)
  - Education, Communication and Outreach (ECO)
  - Scientific and Technical Working Group



# Maryland's Climate Action Plan



## Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change Phase I: Sea-level rise and coastal storms



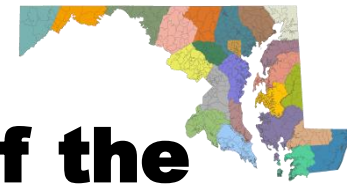
REPORT OF THE MARYLAND COMMISSION ON CLIMATE CHANGE  
ADAPTATION AND RESPONSE WORKING GROUP

## Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change

Phase II: Building societal, economic, and ecological resilience



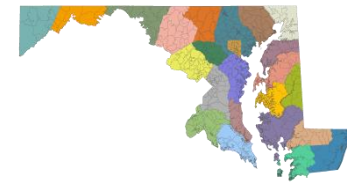
REPORT OF THE MARYLAND COMMISSION ON CLIMATE CHANGE  
ADAPTATION AND RESPONSE AND SCIENTIFIC AND TECHNICAL WORKING GROUPS



# **Public Health Recommendations of the Phase II Comprehensive Plan**

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- Conduct vulnerability assessments to gain a better understanding of risks and inform preventative responses
- Integrate impact reduction strategies into State and local planning practices
- Streamline and revise data collection and information dissemination channels

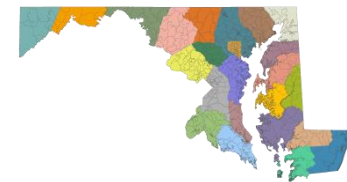


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# Vulnerability Assessment







# Maryland Climate and Health Profile Report

April, 2016

Maryland Institute for Applied Environmental Health  
University of Maryland School of Public Health  
College Park

Prepared for the  
Maryland Department of Health and Mental Hygiene



[http://phpa.dhmdh.maryland.gov/OEHFP/EH/Shared%20Documents/Climate%20Change/MD climate and health FullReport 04182016 %20Final.pdf](http://phpa.dhmdh.maryland.gov/OEHFP/EH/Shared%20Documents/Climate%20Change/MD%20climate%20and%20health%20FullReport%2004182016%20Final.pdf)



## RESEARCH TEAM

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**Crystal Romeo Upperman, MPA**  
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**Jared Fisher, MPH**  
Graduate Student

Maryland Department of Health and Mental Hygiene

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Director, Environmental Health Bureau

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### Contributors

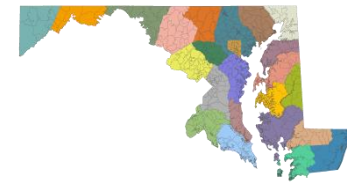
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# Vulnerability

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- The degree to which a population, individual or organization is unable to anticipate, cope with, resist and recover from the impacts of **disasters**. (World Health Organization: Environmental Health in Emergencies)



World Health Organization:

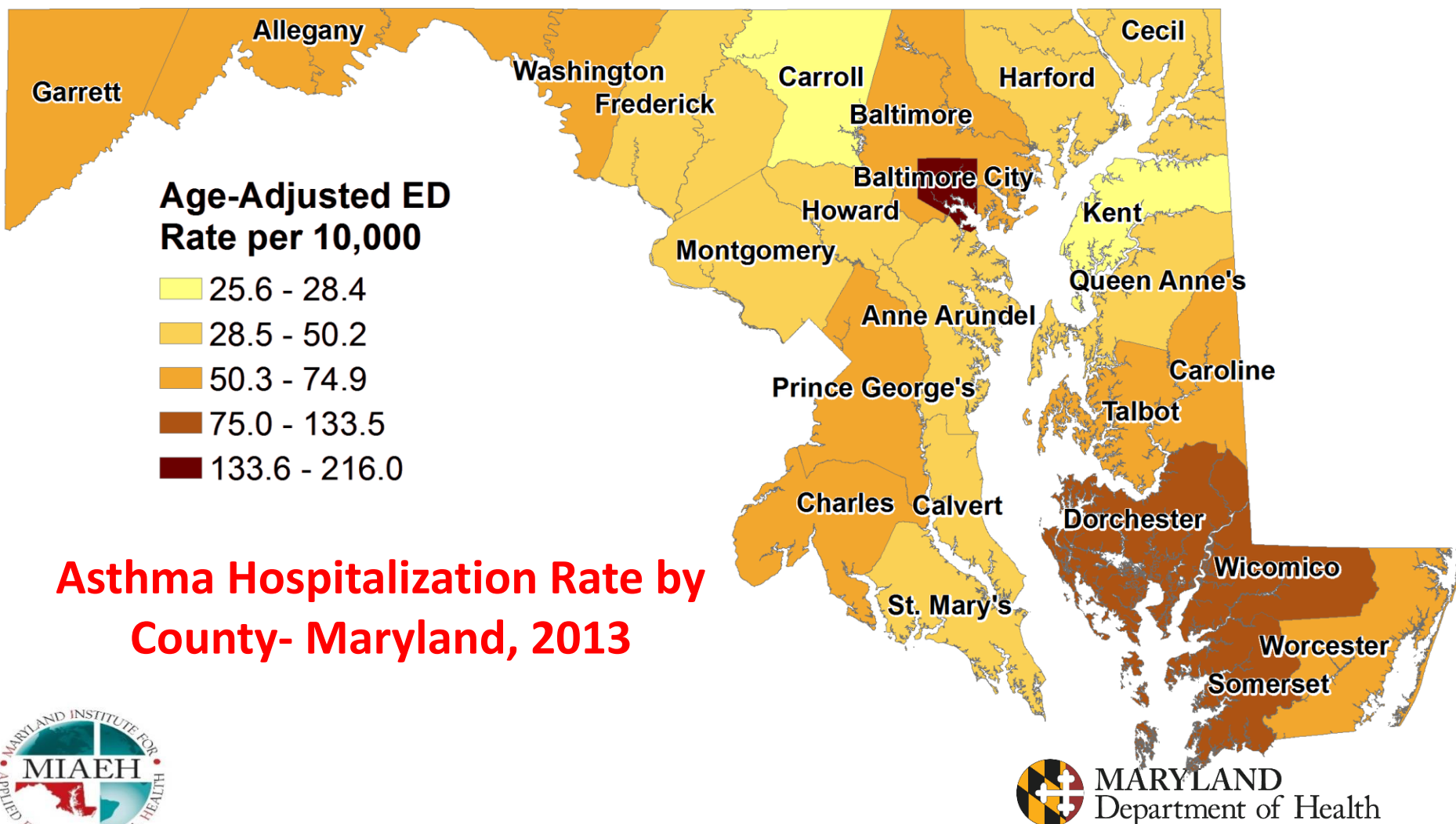
[http://www.who.int/environmental\\_health\\_emergencies/vulnerable\\_groups/en/](http://www.who.int/environmental_health_emergencies/vulnerable_groups/en/)

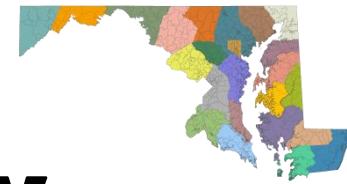


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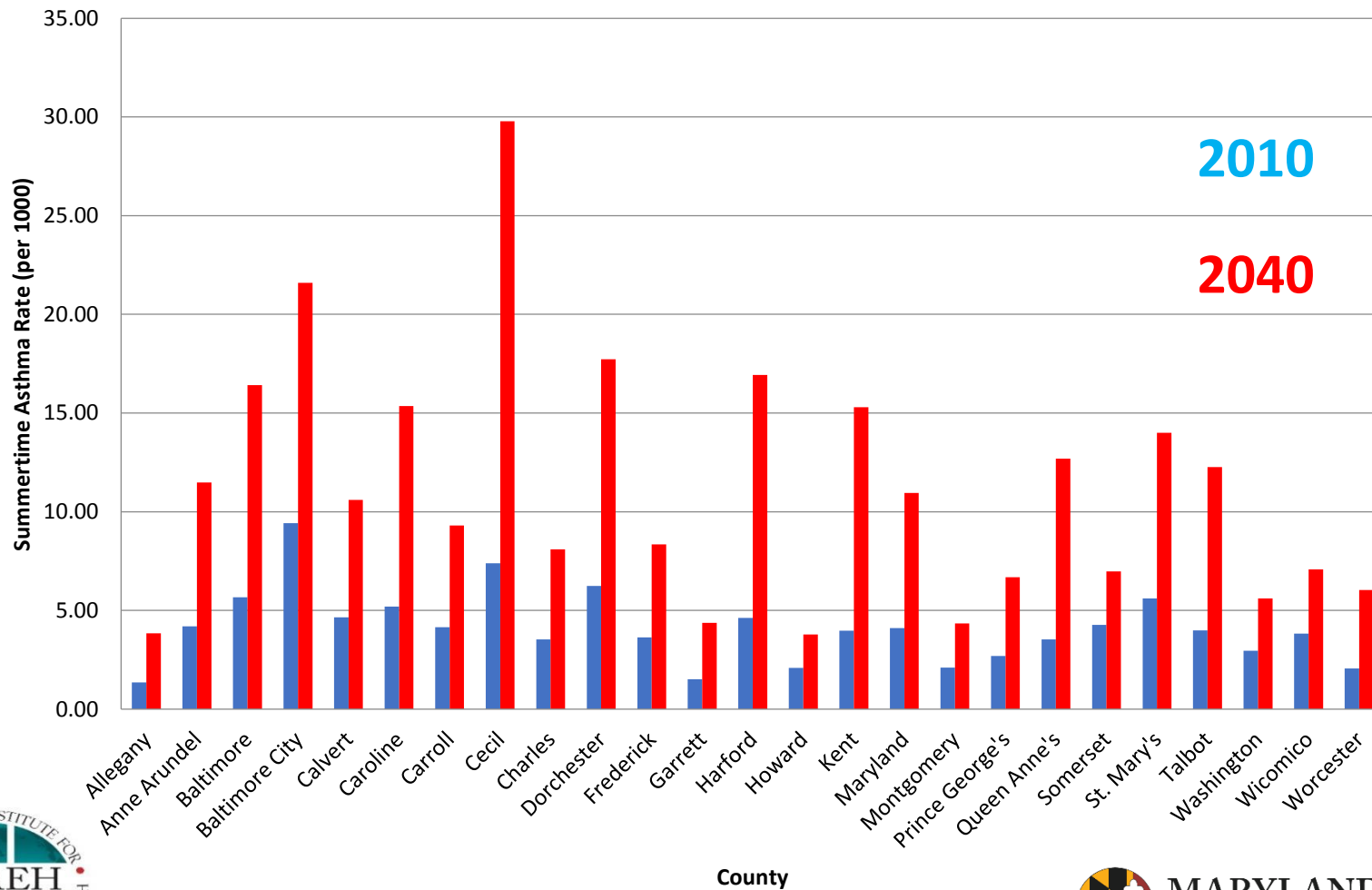


# Health Vulnerability





# Geographic Vulnerability



Source: Maryland Climate and Health Profile, 2016

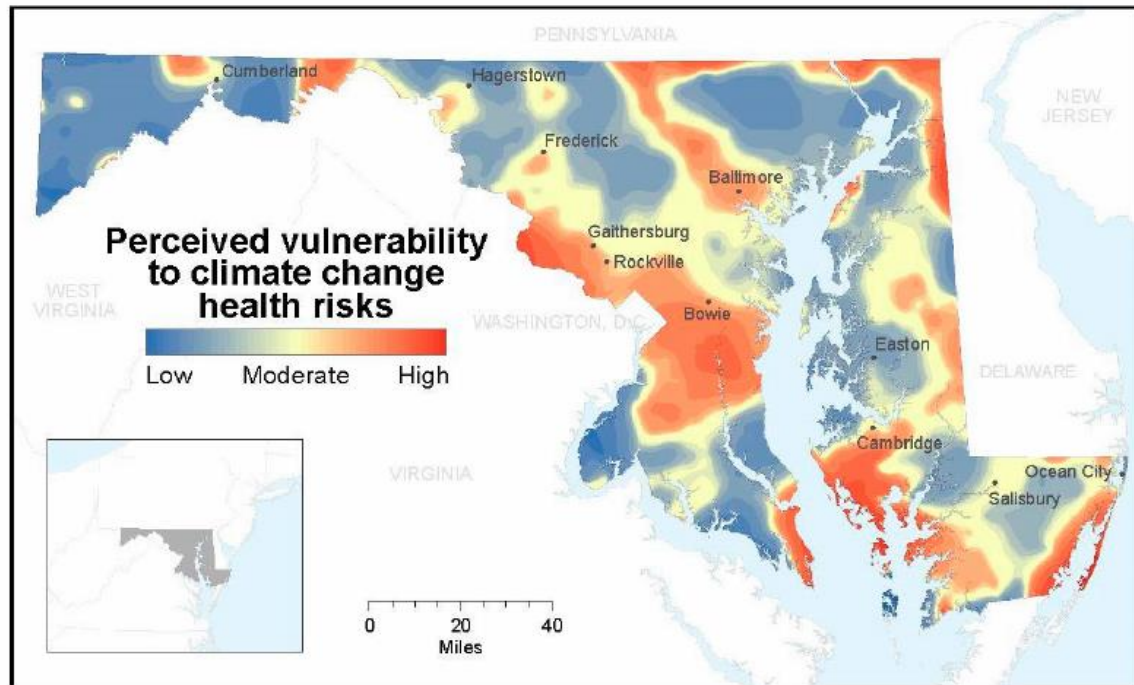


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# Perceptions of Vulnerability to Climate Change

- Having one or more chronic medical conditions
- Being a member of a community of color
- Location in a floodplain
- Lower income



# Engaging with Communities

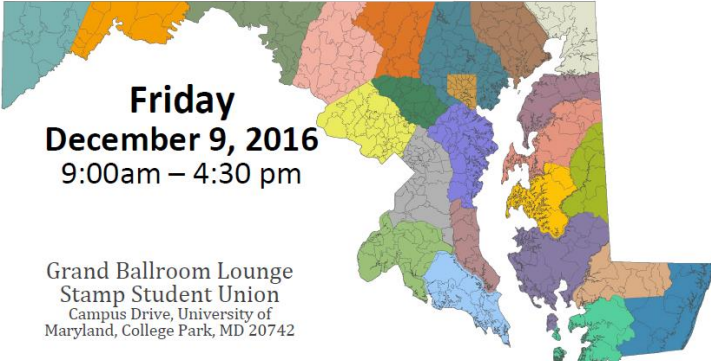
- Who is setting the agenda?
- What questions are being asked?
- Mental health and utilization/availability of mental health resources in the community – may be challenging

## Building Resilient Communities in Maryland: A Stakeholder Forum

Do you have ideas about how to improve environmental health in your community? You are invited to discuss your ideas and suggestions, on issues from climate change to asthma, to injuries or other environmental health problems, at the University of Maryland School of Public Health. Make connections with other communities and brainstorm on how to better tackle the task of improving health and preparing for a changing environment.

[Register Here](https://building-resilient-communities.eventbrite.com)

<https://building-resilient-communities.eventbrite.com>



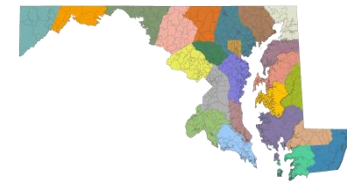
**Friday**  
**December 9, 2016**  
9:00am – 4:30 pm

Grand Ballroom Lounge  
Stamp Student Union  
Campus Drive, University of  
Maryland, College Park, MD 20742



**Questions?**  
Allison Gost | 410-767-6661  
[Allison.gost@Maryland.gov](mailto:Allison.gost@Maryland.gov)

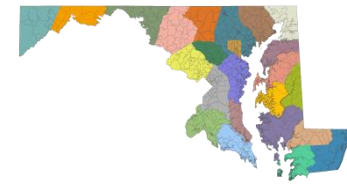




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# Impact Reduction Strategies





# Local Initiatives

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## ➤ Education

- ❖ Climate Ambassadors
- ❖ Shoring Up Resiliency through Education (Project SURE)

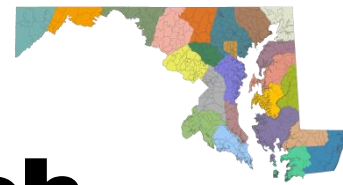
## ➤ Outreach

## ➤ Extension Training





# Communications/Outreach



## Maryland Responds to the Health Impacts of Climate Change

*How changes in weather could affect your health*

As our climate changes, scientists predict that extreme weather events will become more common, more severe and longer lasting, which may erode recent progress Maryland has made on air quality. We are already seeing some of these changes and they are having an effect on human health, directly and indirectly.

- Hotter weather and extended heat waves mean a greater risk of health-related events, such as heat stroke, dehydration and heart attacks.
- An earlier start of spring means a longer pollen season, while wetter weather may increase mold levels in homes. Both of these negatively impact people suffering from allergies.
- More storms may damage infrastructure and reduce healthy living conditions directly (contaminating groundwater supplies) or indirectly (loss of adequate housing in coastal communities).
- More snow and ice events and heavy rains in the fall and winter may increase risk of injuries and motor vehicle accidents.

### WHAT IS MARYLAND DOING TO RESPOND TO THESE IMPACTS?

With grant support from the U.S. Centers for Disease Control and Prevention, the Maryland Department of Health and the Maryland Commission on Climate Change are working closely with vulnerable communities, as well as federal, state and local agencies to assess and prepare for the impacts of climate change on public health. Certain communities may be more vulnerable to climate change because of their location or lack of resources.

Under the Clean Air Act, the Maryland Department of the Environment is charged to protect public health from air pollution. Over the past five years, Maryland's air quality has improved significantly.<sup>2</sup> Climate change will add new challenges to this effort.

<sup>1</sup> <http://rock.maryland.gov/programs/Air/Documents/NOAAAirProgress2017.pdf>

### HOW WILL THIS AFFECT YOU?

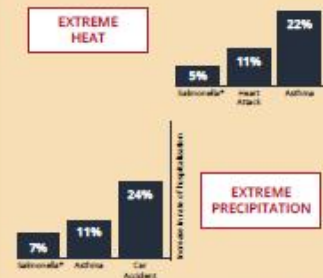
- Air pollution can get worse with higher temperatures, one of the impacts of climate change.
- Increased greenhouse gases contribute to climate change and can increase air pollution and respiratory problems.
- Weather can affect your health directly (for example, heat stroke, heart attack, sunburn or slipping on wet pavement) or indirectly (higher temperatures leads to more ozone, which can worsen asthma).
- While it is hard to predict exactly how a changing climate will affect your family's health, we know that changes in Maryland's climate will probably be worse for people with pre-existing medical conditions (such as allergies and asthma) or groups who are otherwise vulnerable like children, seniors or the poor.
- Vector-borne diseases — such as Lyme Disease from ticks, and encephalitis and West Nile from mosquitoes — may increase, due to longer, higher temperatures and increased precipitation associated with climate change.

Maryland's balanced approach to climate change includes improvements to the economy, new and retained jobs and continued progress in reducing greenhouse gas emissions.

### WHAT IS THE STATE OF HEALTH AND CLIMATE IN MARYLAND?

Maryland is already experiencing impacts to human health due to climate change. In 2016, the Maryland Department of Health and the University of Maryland - School of Public Health developed the *Maryland Climate and Health Profile Report*. The following information from the report is based on data and predictions from multiple sources in Maryland.

### EXTREME WEATHER EVENTS: MARYLAND 2000-2012



Realized change between 2000 and 2012 in negative health outcomes for exposure to extreme weather events in Maryland during summer months.

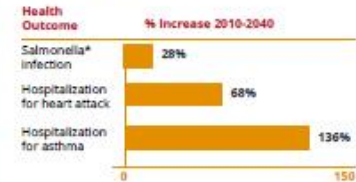
Based on hospitalization data for Maryland during 2000-2012: Summertime extreme heat and precipitation events increased the rate of hospitalization for asthma in Maryland by 22% and 11%, respectively.

In Baltimore City, exposure to extreme heat events increased risk of hospitalization for asthma by 37% during summer months.

<sup>\*</sup>Incidence of salmonella associated with extreme weather events for coastal communities only.

<sup>2</sup> Data compiled from the Maryland Climate and Health Profile Report, April 2016, Maryland Institute for Applied Environmental Health - University of Maryland School of Public Health, College Park.

Projected change in negative health outcomes by 2040 during extreme heat events in Maryland during summer months:<sup>2</sup>



Asthma can be related to extreme heat events. By 2040, Maryland will likely see more than a 136% increase in hospitalization for asthma.<sup>2</sup>

### WHAT CAN YOU DO TO PROTECT YOUR HEALTH?

- Create an emergency plan and evacuation route for you and your family, including plans for family members with specific health needs; prepare an emergency supply kit.
- Check for updates during extreme weather (snow, ice, flooding) before traveling at: [mdma.maryland.gov](http://mdma.maryland.gov).
- During hotter weather, check on vulnerable neighbors and family members and follow health department recommendations to prevent dehydration and heat stroke.
- Know where the cooling centers are in your area, so you can access relief during heat waves.
- Check the Air Quality Index ([bit.ly/2tr1xgE](http://bit.ly/2tr1xgE)) to ensure time outdoors is safe for vulnerable populations.
- Learn more by reviewing the Maryland Climate and Health Profile Report at: <https://bit.ly/mdclimateresources>.

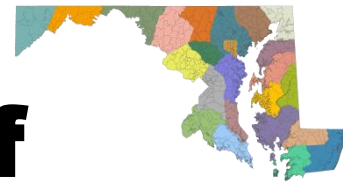
For more information, including meeting calendars and contact information, please visit the Maryland Commission on Climate Change website at: [www.mdc.maryland.gov/mccc](http://www.mdc.maryland.gov/mccc)

MARYLAND COMMISSION ON CLIMATE CHANGE

MARYLAND COMMISSION ON CLIMATE CHANGE

# Training Extension Staff

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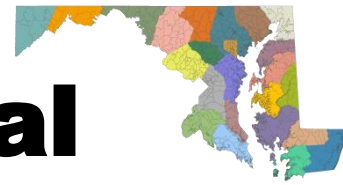


## ➤ Health in a Changing Climate:

- ❖ Agriculture health
- ❖ Home health
- ❖ Healthy living
- ❖ Financial health
- ❖ Food access
- ❖ Resiliency



# Mental Health and Natural Disasters



Department of Health and Human Services

- Federal Emergency Management Agency, state emergency management agencies incorporate behavioral health in their plans
- Finding, allocating resources can be challenging



## Disaster Behavioral Health Response Plan

Compiled By:

Department of Health and Human Services  
129 Pleasant St. Concord, N.H.

**Revised:** June 2004, October 2004, March 2006, October 2007, July 2010, July 2011, December 2011



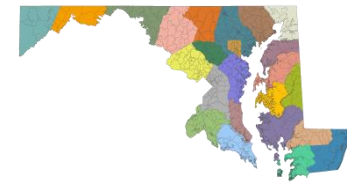


# Mental Health Considerations

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- Delivery of mental health services to people with pre-existing conditions in the post-event period
- Identification of individuals with new-onset symptoms
  - ❖ People with pre-existing mental health problems may be at increased risk
- Restoring pre-event mental health services

# Mental Health and Vulnerable Populations



Prevalence of Physical Health and Mental Health Outcomes Before and After Hurricane Katrina

Outcome	Definition	Before Katrina	After Katrina	McNemar Test
		% [95% CI]	% [95% CI]	p-value
MMI/SMI	Probable mild-moderate (K6 >7) or serious (K6 >12) mental illness	23.5 [19.3 - 27.7]	37.5 [32.7 - 42.3]	< .001
SMI	Probable serious (K6 >12) mental illness	6.9 [4.4 - 9.4]	13.8 [10.4 - 17.2]	< .001
PTSD	Post-traumatic stress disorder: IES-R average score >1.5	ND	47.7 [42.8 - 52.6]	NA
PSS	Perceived stress scale > 7	20.2 [16.2 - 24.1]	30.9 [26.3 - 35.4]	< .001
FPH	Fair or poor self-rated health status	12.8 [8.8–15.2]	19.1 [15.1–22.9]	< .01
HC	At least one diagnosed health condition	61.2 [56.4–66.0]	66.6 [61.9–71.3]	< .05
OVERW	Body mass index (kg/m <sup>2</sup> ) >25	67.1 [62.4–71.7]	72.9 [68.6–77.4]	< .01

*Note.* P-value is from a *t*-test of the hypothesis that the change is equal to 0. CI = confidence interval; IES-R = Impact of Event Scale-Revised; ND = not determined; NA = not applicable.

Rhodes J, et al. Am J Orthopsychiatry. 2010 Apr;80(2):237-247.



# Mental Health Issues Can Be Persistent



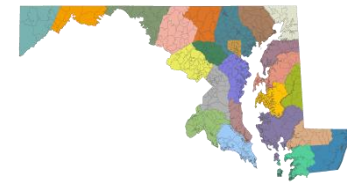
- Rates of depression, anxiety, PTSD increase in widespread flooding:

English floods of 2013-2014:

		Depression (%)	Anxiety (%)	PTSD (%)
One Year	Flooded	20.1	28.3	36.2
	Disrupted	9.6	10.7	15.2
Two Years	Flooded	10.6	13.6	24.5
	Disrupted	4.1	6.4	8.9
Unaffected		1.5	2.9	0.0

Jermacane D et al. BMC Public Health. 2018 Mar 7;18(1):330.





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# Data Collection and Information Dissemination



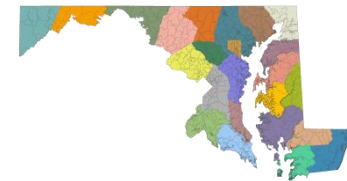
# Environmental Public Health Tracking Portal

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- Climate indicators
- Indicators relevant to communities
  - ❖ Social determinants
  - ❖ Life expectancy
  - ❖ Current health
  - ❖ Exposure disparities
- Implications for Mental Health

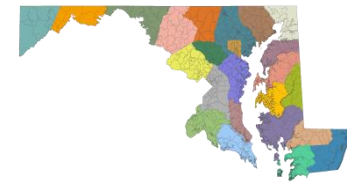




# Conclusions

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- Value of integrating discussions about climate change, all disasters, community preparedness, and local community resiliency
- Meeting communities where they are, even if the topic isn't what you were hoping to discuss.
- Mental health preparedness – make sure you have mental health resources



# Acknowledgments

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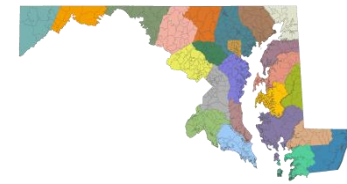
- Maryland  
Department of Health
  - ❖ Subha Chandar
  - ❖ Matt Folley
  - ❖ Rachel Hess-Mutinda
  - ❖ Ann Liu
  - ❖ Kishok Rojohn

- University of Maryland
  - ❖ Allison Gost
  - ❖ Amir Sapkota
  - ❖ Min Qi Wang
- U. S. Centers for  
Disease Control and  
Prevention

This work was supported by the U.S. Centers for Disease Control and Prevention cooperative agreement number 5 N01EH001323.



MARYLAND  
Department of Health



# References

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Jermacane D, Waite TD, Beck CR, et al. The English National Cohort Study of Flooding and Health: the change in the prevalence of psychological morbidity at year two. *BMC Public Health*. 2018 Mar 7;18(1):330. doi: 10.1186/s12889-018-5236-9.

Rhodes J, Chan C, Paxson C, Rouse CE, Waters M, Fussell E. The impact of hurricane Katrina on the mental and physical health of low-income parents in New Orleans. *Am J Orthopsychiatry*. 2010 Apr;80(2):237-247. doi: 10.1111/j.1939-0025.2010.01027.x.

Sullivan G, Vasterling JJ, Han X, Tharp AT, Davis T, Deitch EA, Constans JI. Preexisting mental illness and risk for developing a new disorder after hurricane Katrina. *J Nerv Ment Dis*. 2013 Feb;201(2):161-6. doi: 10.1097/NMD.0b013e31827f636d.

