



**WEATHERING
CHANGE**



ANTIOCH UNIVERSITY NEW ENGLAND
**Center for Climate Preparedness
and Community Resilience**



Dr. Christa Daniels
Senior Associate CCPCR

**Strengthen communities to prepare, respond and recover
in the face of climate impacts and other disruptions
through collaborative, innovative solutions.**

communityresilience-center.org

Local Solutions for Strong Communities

... a series of online courses focused on the fundamentals of climate change resilience.

- Engage in each course for 4 weeks
- Enroll for graduate credit or audit the course
- Increase your skill set in climate resilience for better outcomes
- Discover solutions to local issues you face on the job or in your community.
- Register for one course or the whole series.

<http://www.communityresilience-center.org/climate-change-resilience-series/>



Climate Change Resilience

... a series of online courses focused on the fundamentals of climate change resilience.

Join us for the next online course in this series

Climate Impacts: Public Health

January 26 – February 22, 2020

<http://www.communityresilience-center.org/climate-impacts-public-health/>



Instructor:
Dr. Christa Daniels

Local Solutions for Strong Communities

Save the Date!

2020 Local Solutions Eastern Climate Preparedness Conference

May 11-12, 2020 • Holiday Inn By
the Bay • Portland, Maine

<http://www.communityresilience-center.org/conferences/2020-local-solutions-eastern-climate-preparedness-conference/>





Meet the challenges of a changing climate by finding information and tools to help you understand and address your climate risks.

toolkit.climate.gov

Dr. Ned Gardiner
Engagement Manager



Meet the Challenges of a Changing Climate

Find information and tools to help you understand and address your climate risks.

LEARN HOW TO BUILD
RESILIENCE ›

SEE WHAT OTHERS ARE
DOING ›

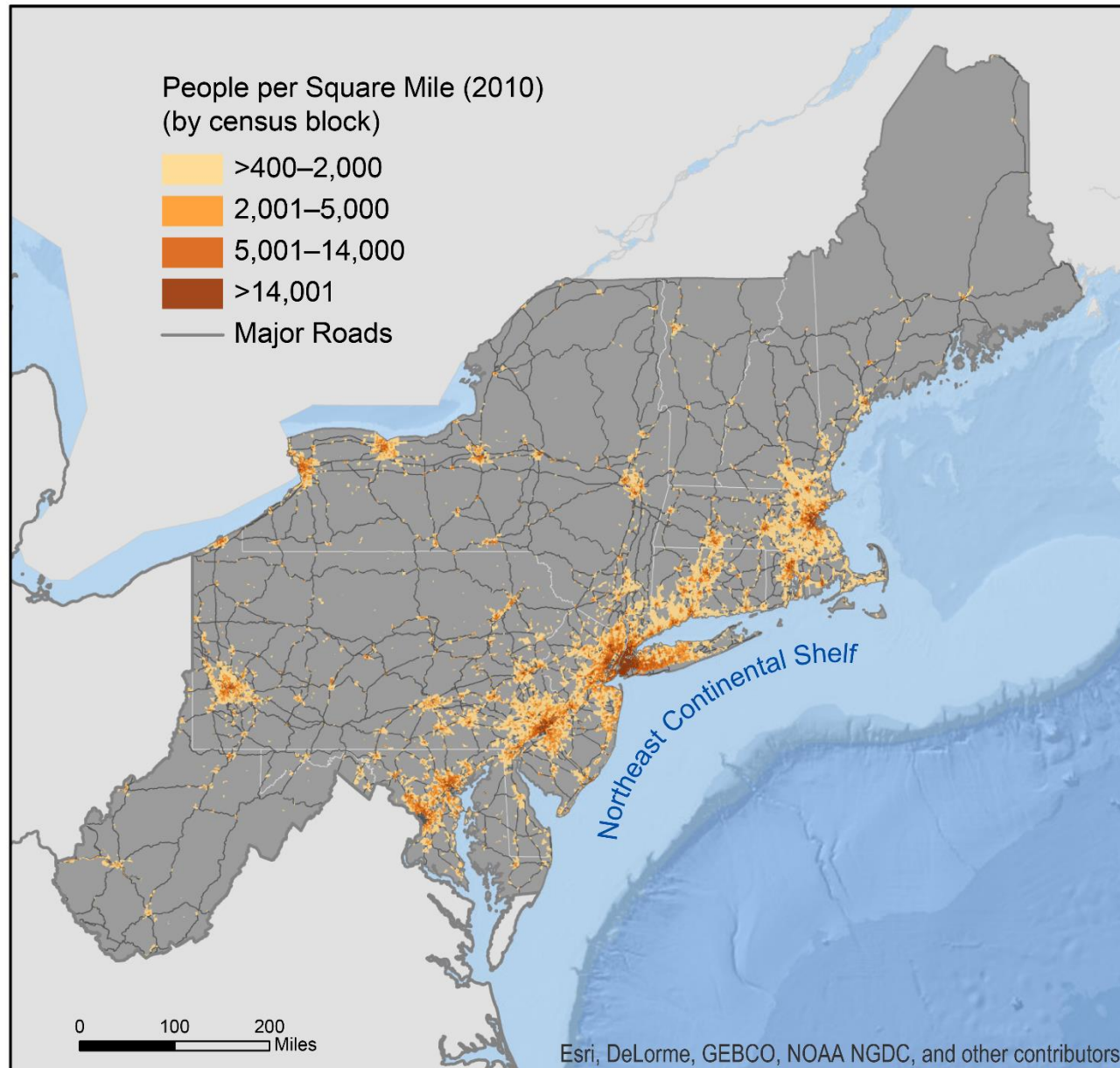
USE THE CLIMATE
EXPLORER ›

TOUR THE TOOLKIT ▾

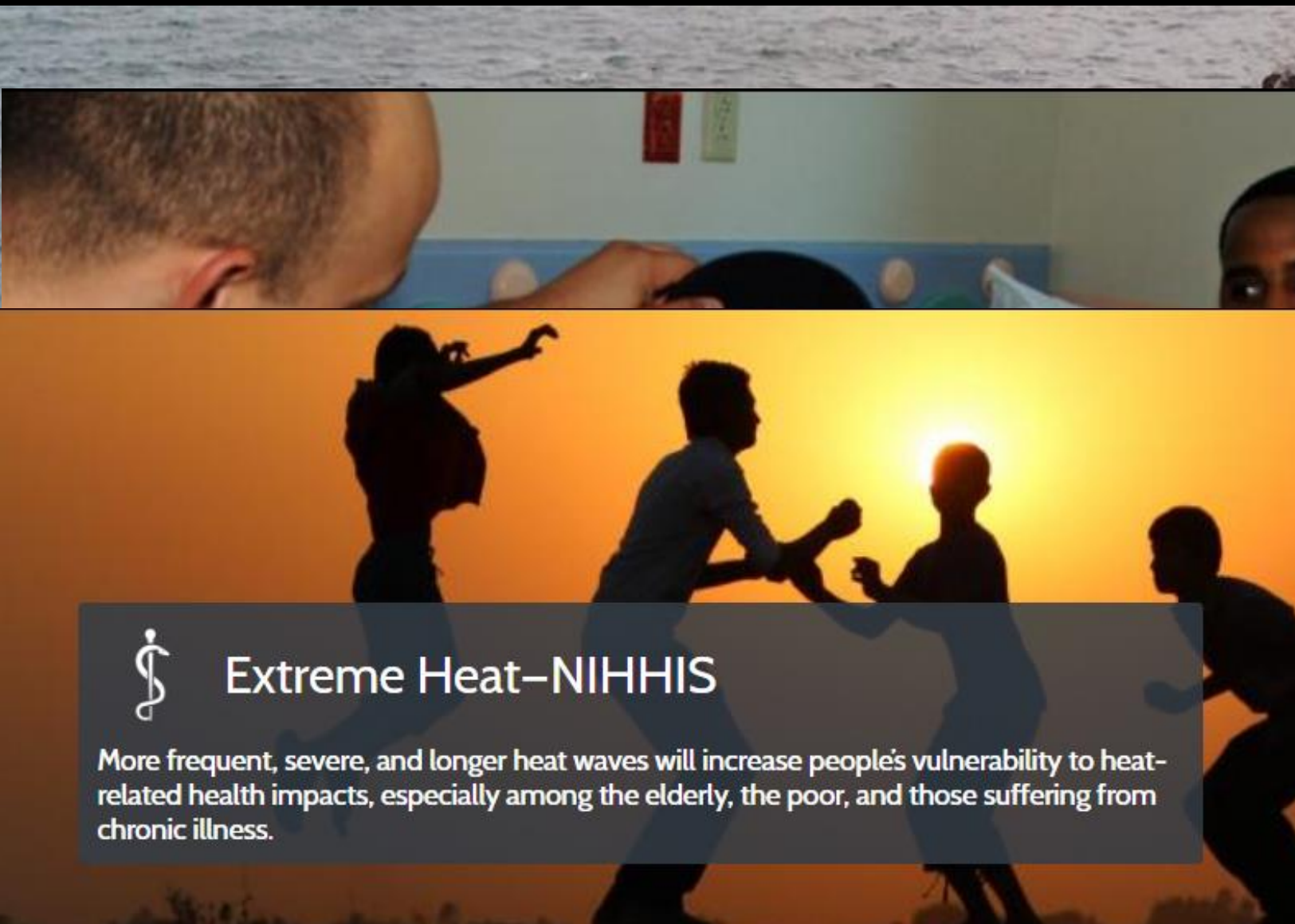


FOURTH NATIONAL CLIMATE ASSESSMENT

CHAPTER 18: NORTHEAST



- Changing seasons
- Coasts
- Urban communities
- Human Health
- Adaptation



Case Studies

- [Bracing for Heat >](#)
- [Catalyzing Investment and Building Capacity in Las Cruces >](#)
- [Charting Colorado's Vulnerability to Climate Change >](#)
- [Creating a Model Climate Resilient City >](#)
- [Developing an Early Warning System to Prevent Heat Illness >](#)

1 of 2 [next >](#)

Related Tools

- [AirNow: Air Quality Index \(AQI\) Monitoring and Forecasts >](#)
- [Assessing Health Vulnerability to Climate Change: A Guide for Health Departments >](#)
- [Beat the Heat in Houston >](#)
- [Building Resilience Against Climate Effects \(BRACE\) Framework >](#)
- [Cities Impacts & Adaptation Tool \(CIAT\) >](#)

1 of 11 [next >](#)



Extreme Heat—NIHHIS

More frequent, severe, and longer heat waves will increase people's vulnerability to heat-related health impacts, especially among the elderly, the poor, and those suffering from chronic illness.

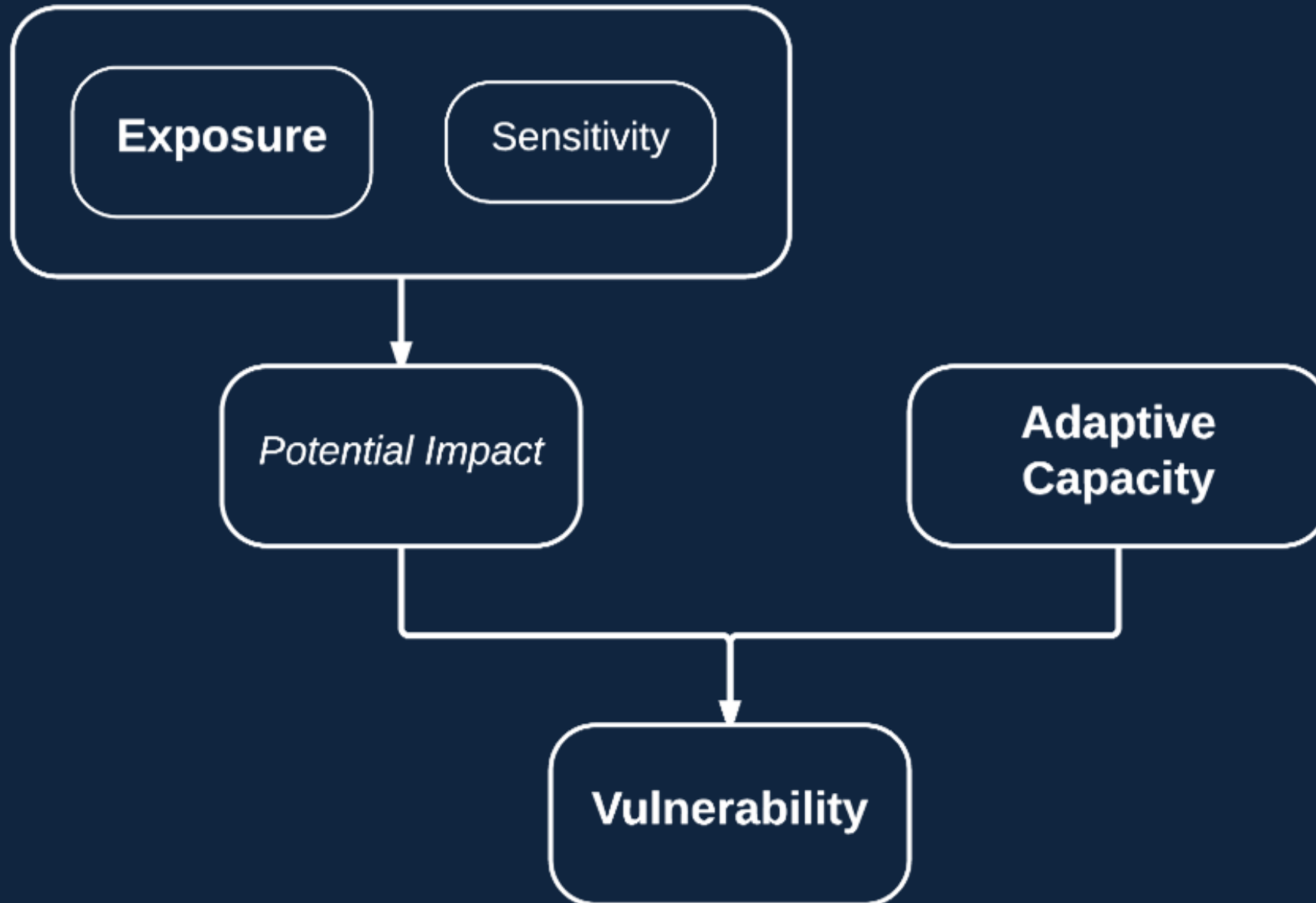
Building Resilience Against Climate Effects (BRACE) Framework

Communities can use this five-step process from the Centers for Disease Control and Prevention to prepare for the health effects of climate change.



CDC BRACE Framework's five steps map to the Steps to Resilience. Using the [Steps to Resilience](#) allows people from any discipline to collaborate using common terminology and process.





Logistics



If you have a question, please write it in the Q&A section (not Chat) and select to All Panelists, so we can see the questions.



If you are having technical difficulty, please use Chat and send to Host, so we can address the issue with you directly.



The presentation will be recorded and posted to the Antioch website within a week www.communityresilience-center.org

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Matt Cahillane

New Hampshire Department of Health and Human Services, Division of Public Health Services, Bureau of Public Health Protection.



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Climate Impacts: Overview

National, State and Local

Response to the Health Impacts

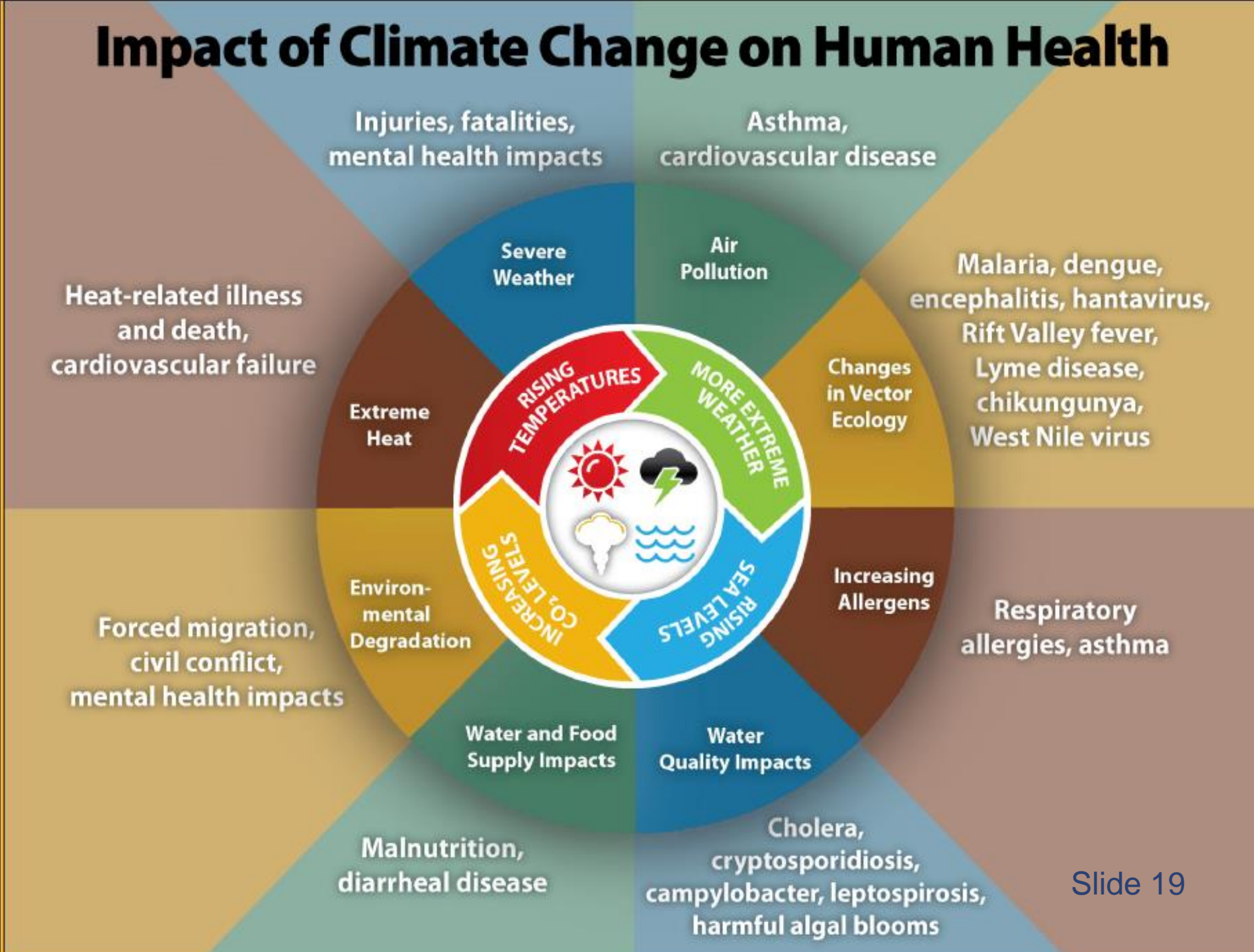
of a Changing Climate

Matt Cahillane, MPH
Climate Program Manager
Division of Public Health Services
NH Department of Health and Human Services

Basic Terminology

- ▶ Adaptation and Mitigation
- ▶ Exposure Pathways
- ▶ Epidemiology
- ▶ Direct and Indirect Impacts
- ▶ Assessments and Interventions
- ▶ Resilience

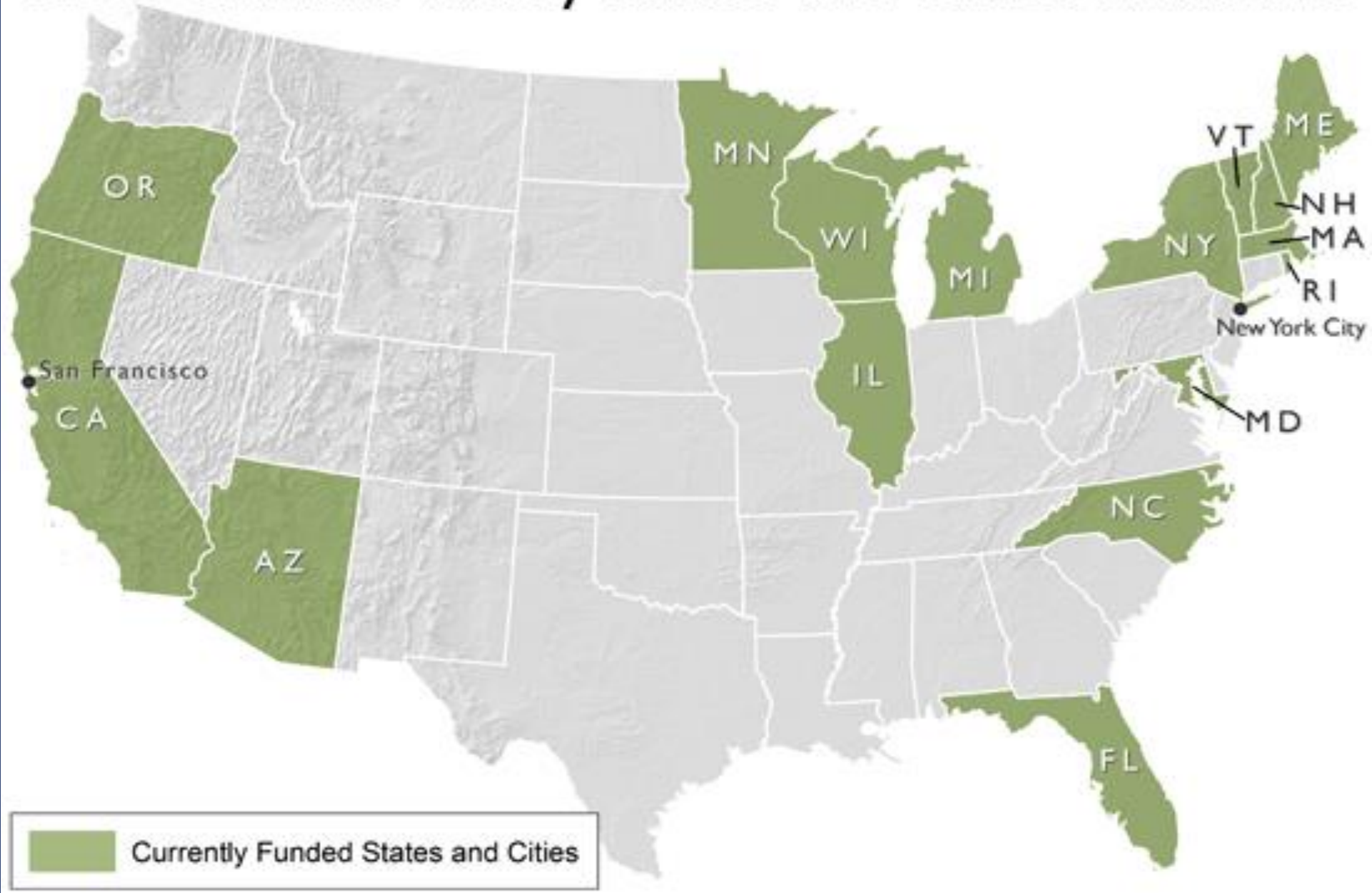
Impact of Climate Change on Human Health



National Response to Health Impacts

- ▶ Leadership via CDC Climate & Health Program, EPA, NOAA and others
- ▶ Assessments
 - Coordinate and publish systemic reviews (e.g. NCA)
 - Fund research on changing conditions & risks
- ▶ Interventions
 - CDC Climate Ready States & Cities Initiative (CRSCI)
 - includes 18 states and cities, plus 7 tribal nations, and academic partners
 - NOAA Coastal Resilience grants, EPA Climate Change Research grants
- ▶ Policy initiatives on mitigation and adaptation (e.g. Clean Power Plan)

CDC Climate Ready States and Cities Initiative



A Framework for Assessment & Intervention



Key Message

- ▶ Experts agree that the Northeast US climate has become
 - Warmer
 - Wetter
 - With more severe weather and sea level rise
 - – and all these changes may result in human health impacts.

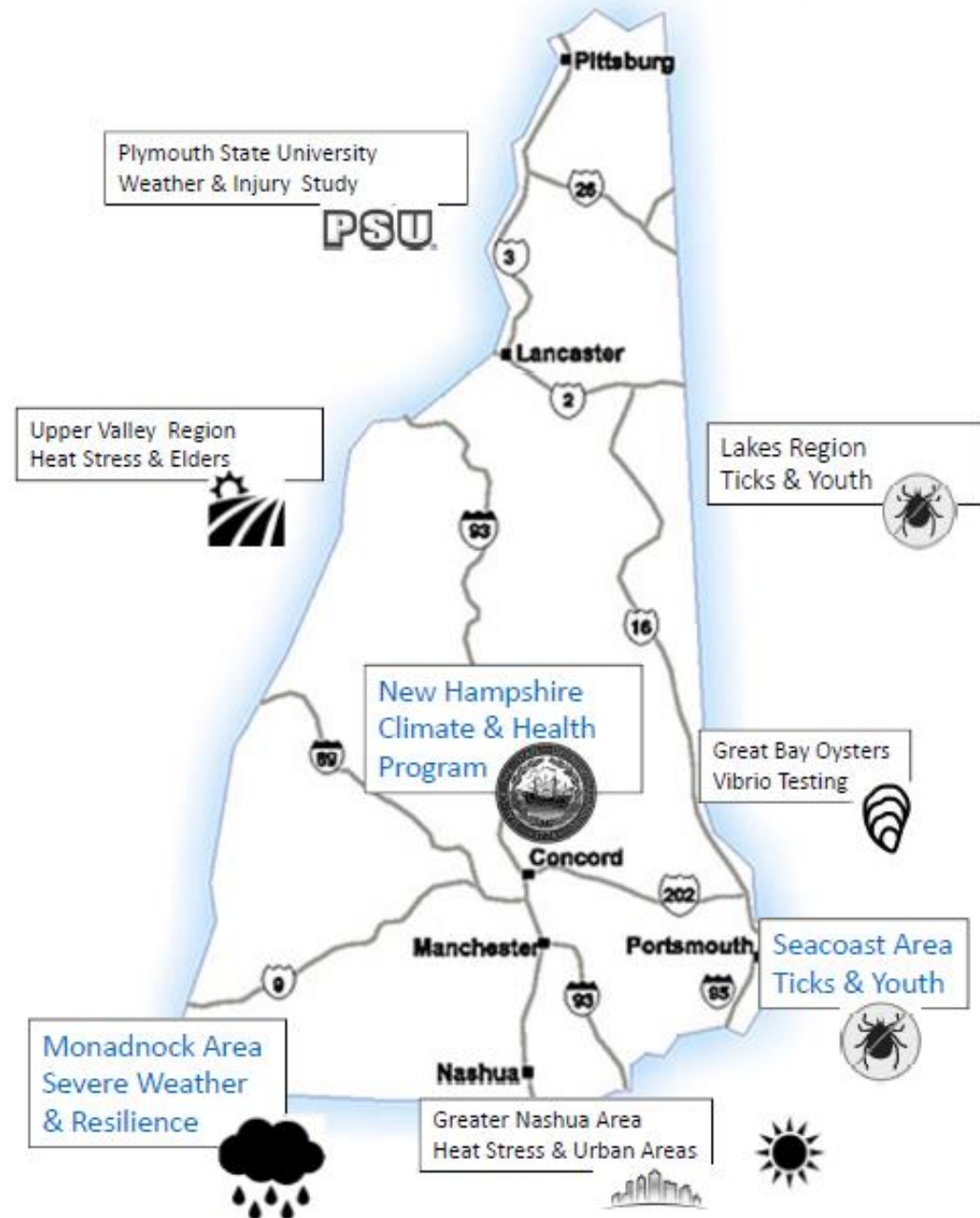
State Level Response to Health Impacts

- ▶ State provides leadership via multiple programs to:
 - Engage with partners
 - Train the H&E workforce
 - Track data, analyze, and post to public data portals
 - Gather new data, analyze and publish results
- ▶ Assessment of environmental conditions & health impacts
- ▶ Interventions to change conditions and build resilience
- ▶ Communicate findings to stakeholders
- ▶ Inform policy change

List of Projects

- ▶ Past Assessments
 - UNH atmospheric projections
 - USGS hydrologic projections
 - PSU weather & injury trends
 - Great Bay conditions & oyster bacteria levels
 -
- ▶ Current & past interventions
 - Monadnock
 - Seacoast
 - Lakes Region
 - Upper Valley
 - City of Nashua

NH DPHS Climate & Health Projects



Updated 10/15/2019

Local Response to Health Impacts - Examples

1. Monadnock severe weather and resilience
2. Seacoast Region insect habitat and tick safe practices

Greater Monadnock Severe Weather and Resilience among Older Adults

Three interventions to increase knowledge, abilities, and awareness

1. Training of older adults
2. Support to build an emergency kit
3. Community information campaign



Seacoast Insect Habitat and Tick Safe Practices among Adult Caregivers

Four interventions to increase knowledge or change conditions.

1. Training of summer camp and YMCA staff
2. Training of health care providers
3. Tick habitat assessment and control
4. Policy change for insect repellent



Lessons Learned

1. The community engagement and plan development were a significant investments of time, and viewed as important to success of the final intervention
2. The intervention findings showed limited change in KSAs & behavior, yet a good test of the methods
3. Identified a need to implement fewer projects with more focused resources for EBPH interventions & evaluation

For More Information, Contact:

Matt Cahillane

NH DHHS, Climate and Health Program

603-271-4072; matthew.cahillane@dhhs.nh.gov

Or visit our website

www.dhhs.nh.gov/dphs/climate/

This project was supported by grant number #NUE1 EH001332-04 from the National Center for Environmental Health (NCEH) at the Centers for Disease Control and Prevention (CDC) in Atlanta. Its content is solely the responsibility of the authors and does not necessarily represent the official views of the CDC.



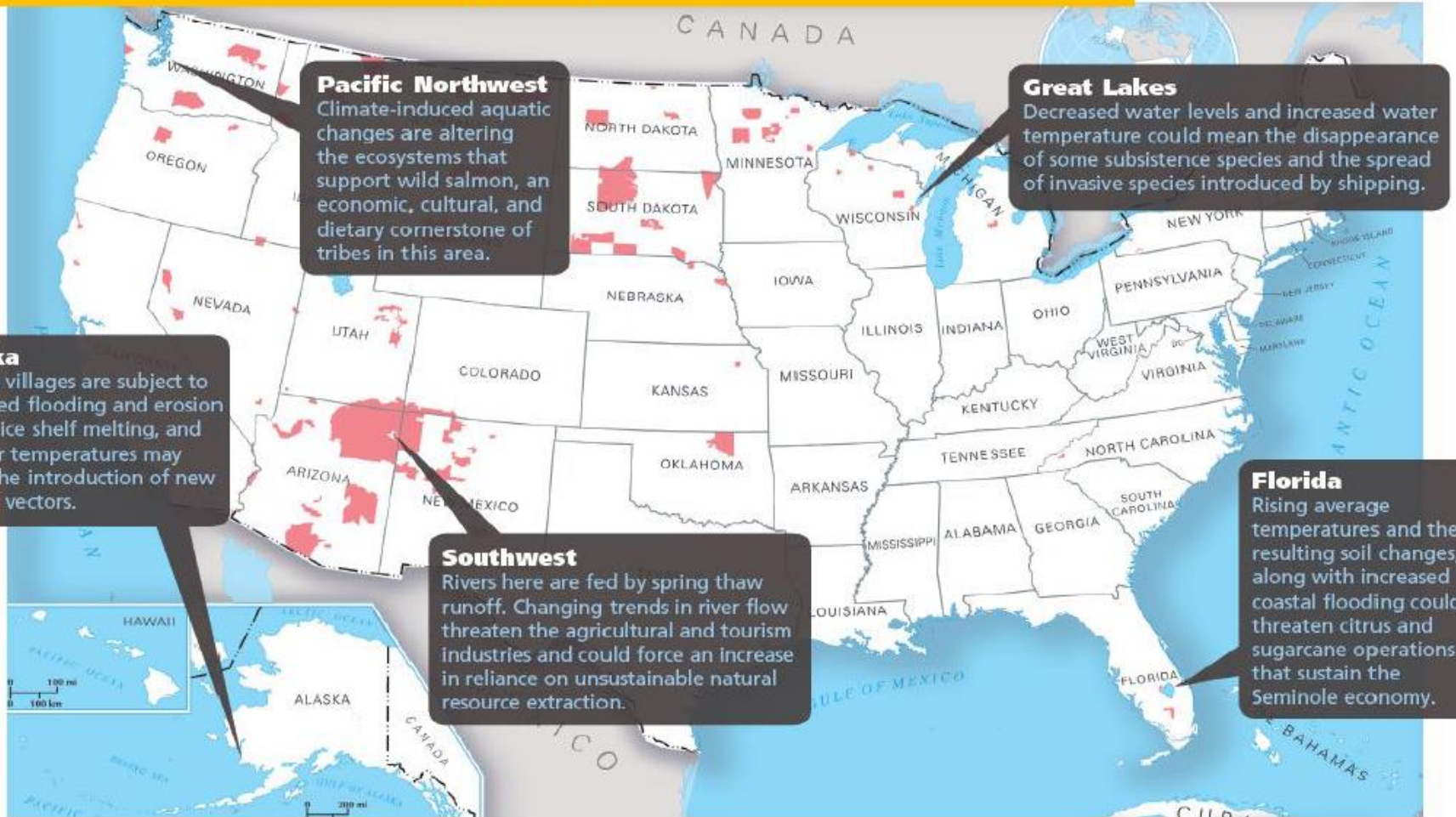
References

- ▶ National Climate Assessment - <https://nca2018.globalchange.gov/chapter/18/>
- ▶ CDC Climate Ready States and Cities Initiative https://www.cdc.gov/climateandhealth/climate_ready.htm
- ▶ CDC Building Resilience Against Climate Effects (BRACE) <https://www.cdc.gov/climateandhealth/BRACE.htm>
- ▶ CDC Climate and Health publications page <https://www.cdc.gov/climateandhealth/publications.htm>
- ▶ CDC 'Impact of Climate Change on Health' <https://www.cdc.gov/climateandhealth/effects/default.htm>

- ▶ NH DHHS Climate and Health Program <https://www.dhhs.nh.gov/dphs/climate/index.htm>
- ▶ NH DHHS Environmental Health Tracking Program <https://www.dhhs.nh.gov/dphs/hsdm/epht.htm>
 - <https://www.dhhs.nh.gov/dphs/hsdm/wisdom/index.htm>

- ▶ Monadnock Climate & Health Adaptation Plan - <http://www.swrpc.org/chap>
- ▶ Seacoast Climate & Health Adaptation Plan - http://www.seacoastphn.org/uploads/8/4/0/0/84005490/seacoast_plan_of_action_03.4.19_b.pdf

Examples of Climate Change's Impacts on Tribes Nationwide



Tribal lands are indicated in pink. Sources: map—www.nationalatlas.gov; climate change effect predictions—Hanna JM. 2007. Native communities and climate change: protecting tribal resources as part of national climate policy. Boulder, CO: Natural Resources Law Center / NWF. 2007. Overview of recent research: effects of global warming on the Great Lakes [fact sheet]. Ann Arbor, MI: National Wildlife Federation.

Source: Climate Change and Health: A Native American Perspective

Tribal Projects

- Alaska
 - Coastal floods & erosion
- Pacific Northwest
 - Salmon habitat
- Southwest
 - Threats to food and tourism
- Great Lakes
 - Invasive species
- Florida
 - Subsistence agriculture

Climate Ready Tribes



Awardees Include

First cohort

Blackfeet Nation

Swinomish Indian Tribal Community

Village of Wainwright

New cohort

Kaw Nation (mini-award)

Lummi Nation

Pala Band of Mission Indians

Sitka Tribe of Alaska

Dr. Kathleen Bush

Program Manager for the Environmental Public Health Tracking Program at the New Hampshire Department of Health and Human Services, Division of Public Health Services. She also supports the Climate and Health Program.

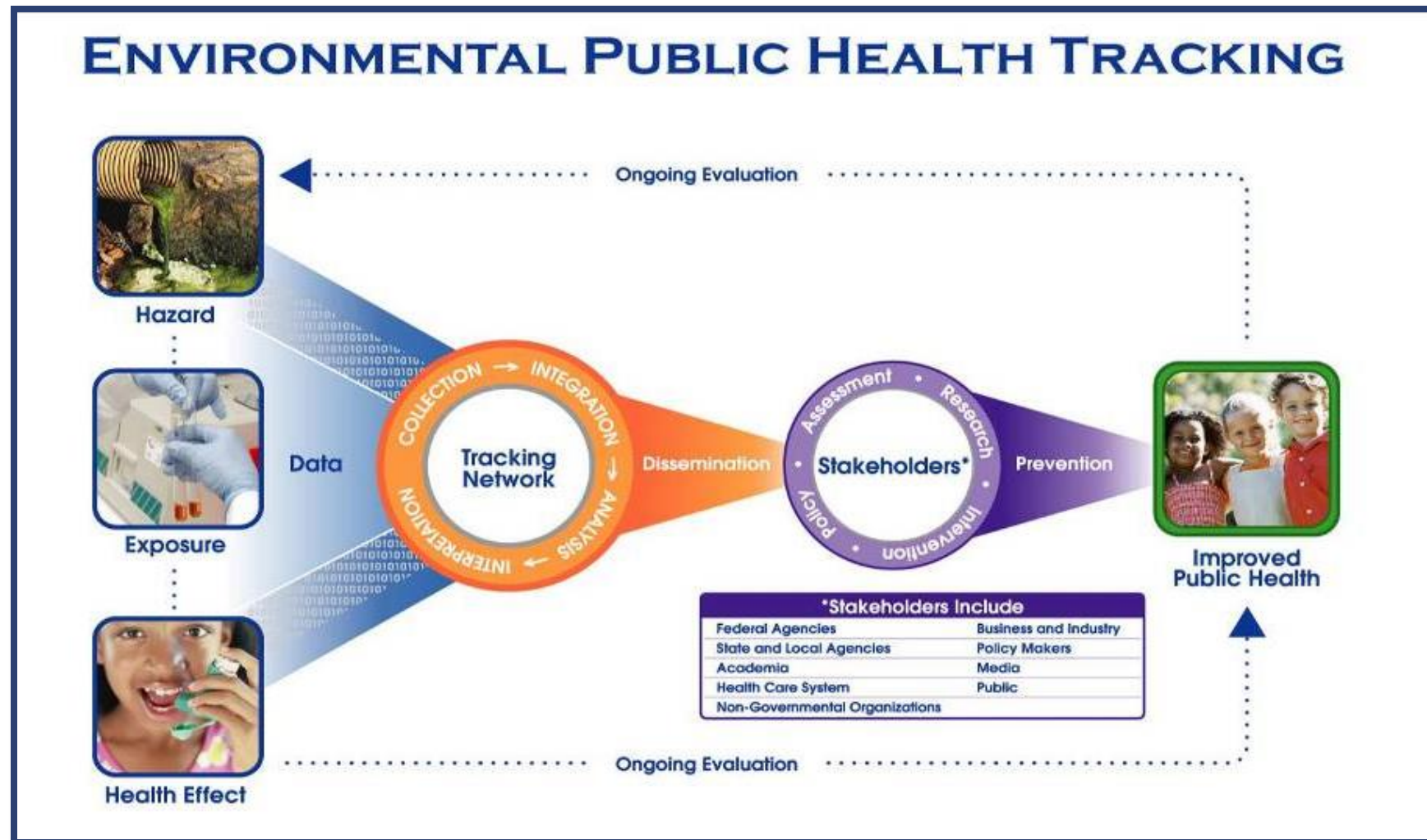
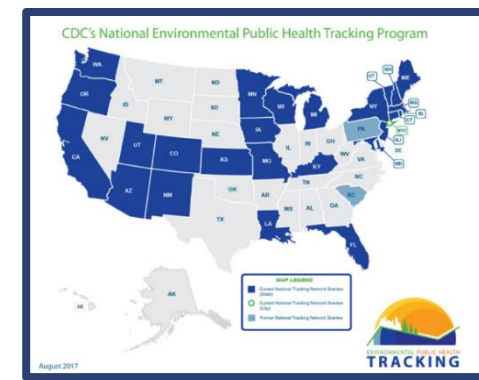


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Climate Impacts: Public Health *Linking Exposures and Outcomes* *& Identifying High-Risk Areas*

Kathleen Bush, PhD
EPHT Program Manager
Division of Public Health Services
Department of Health and Human Services

Data to Action



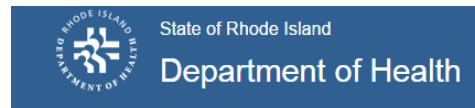
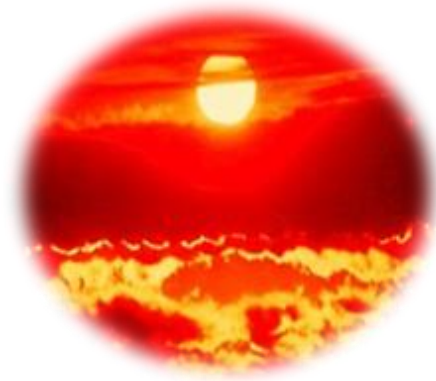
***Stakeholders Include**

Federal Agencies	Business and Industry
State and Local Agencies	Policy Makers
Academia	Media
Health Care System	Public
Non-Governmental Organizations	

Northeast Regional Heat Collaborative

Heat and Health: Translating Data into Action

Lowering Our Heat Advisory Threshold to Protect Public Health



Paul R. LePage, Governor

Mary C. Mayhew, Commissioner

Rationale

Heat is a major threat to public health.

Limited information on:

- risk of ED visits,
- effects in the Northeast,
- impacts outside of large metropolitan areas.

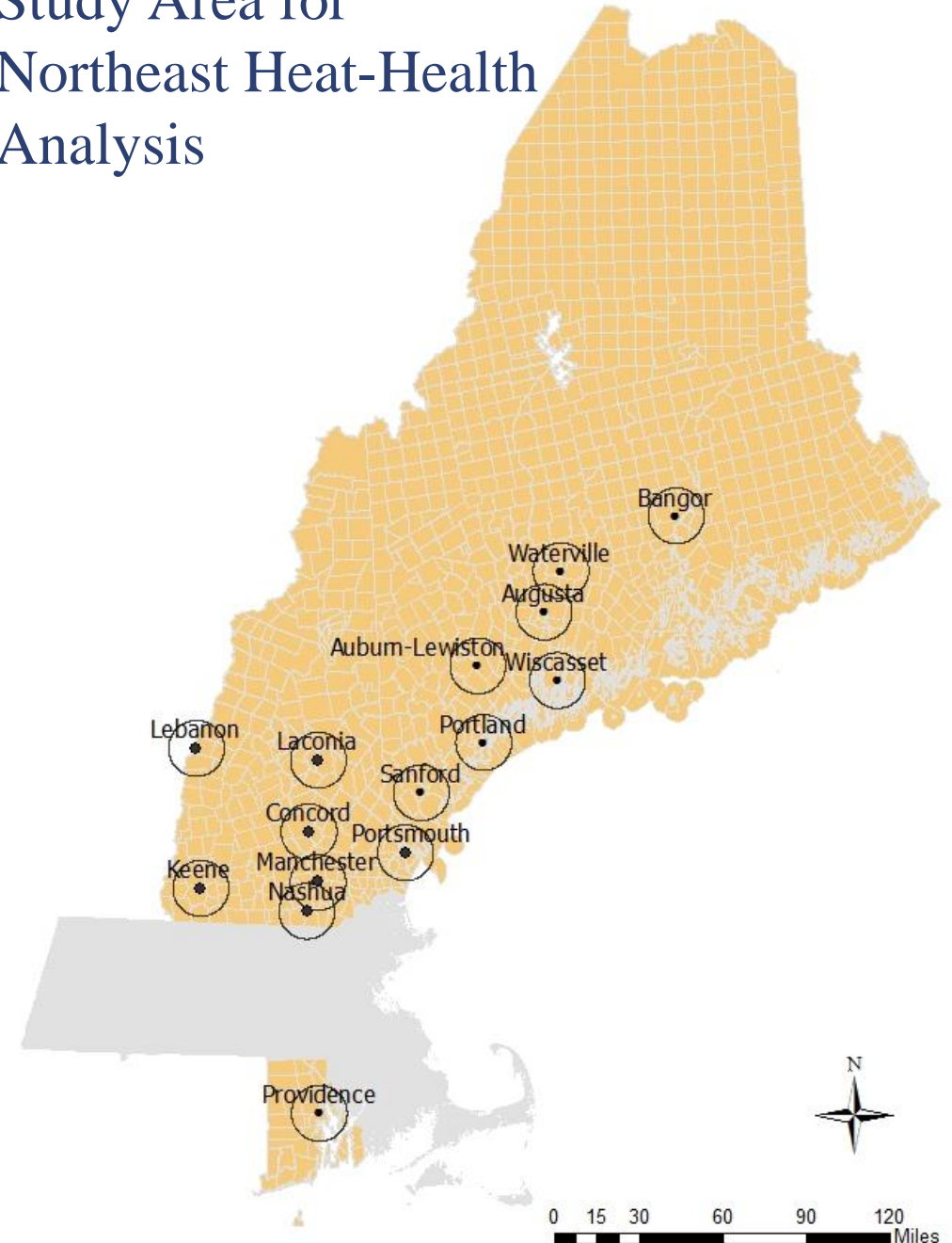
Hypothesis: Heat-related illness and death will be reduced by lowering heat advisory thresholds.



Key Questions

1. How does heat index impact health?
2. Are current Heat Advisories optimal for protecting public health in the Northeast?
3. What can state and local health agencies do to reduce risk?

Study Area for Northeast Heat-Health Analysis



Data

Study Period

- May 1-September 30
- RI (2005-2012); ME (2001-2010); & NH (2000-2009)

Study Area

- Towns within 10 miles of a NOAA weather station (ME, NH), and all of RI
- Population included 60% of ME, 66% of NH, and 100% of RI (~2.7 million people)

Exposure

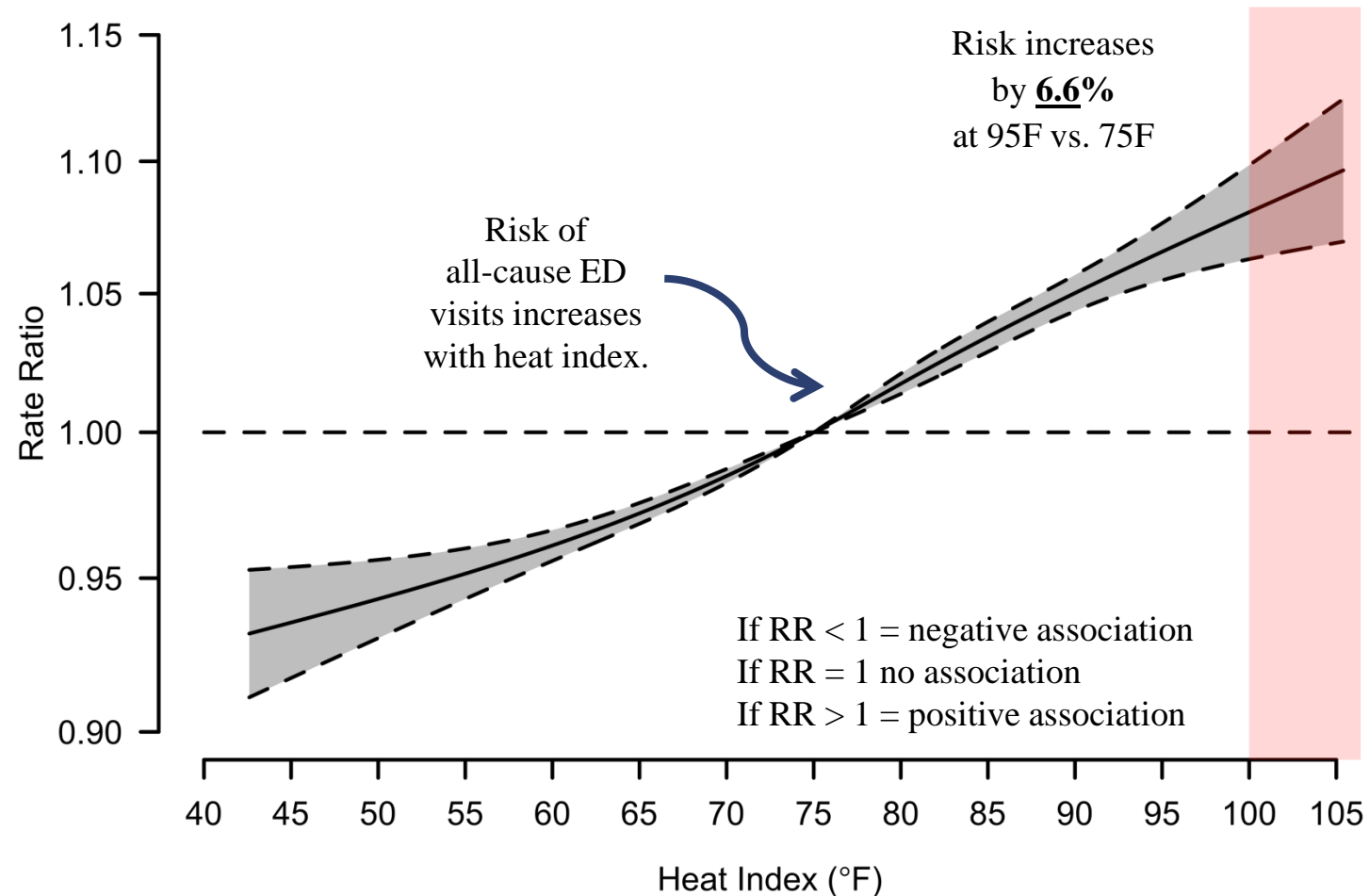
- Daily maximum heat index

Outcome

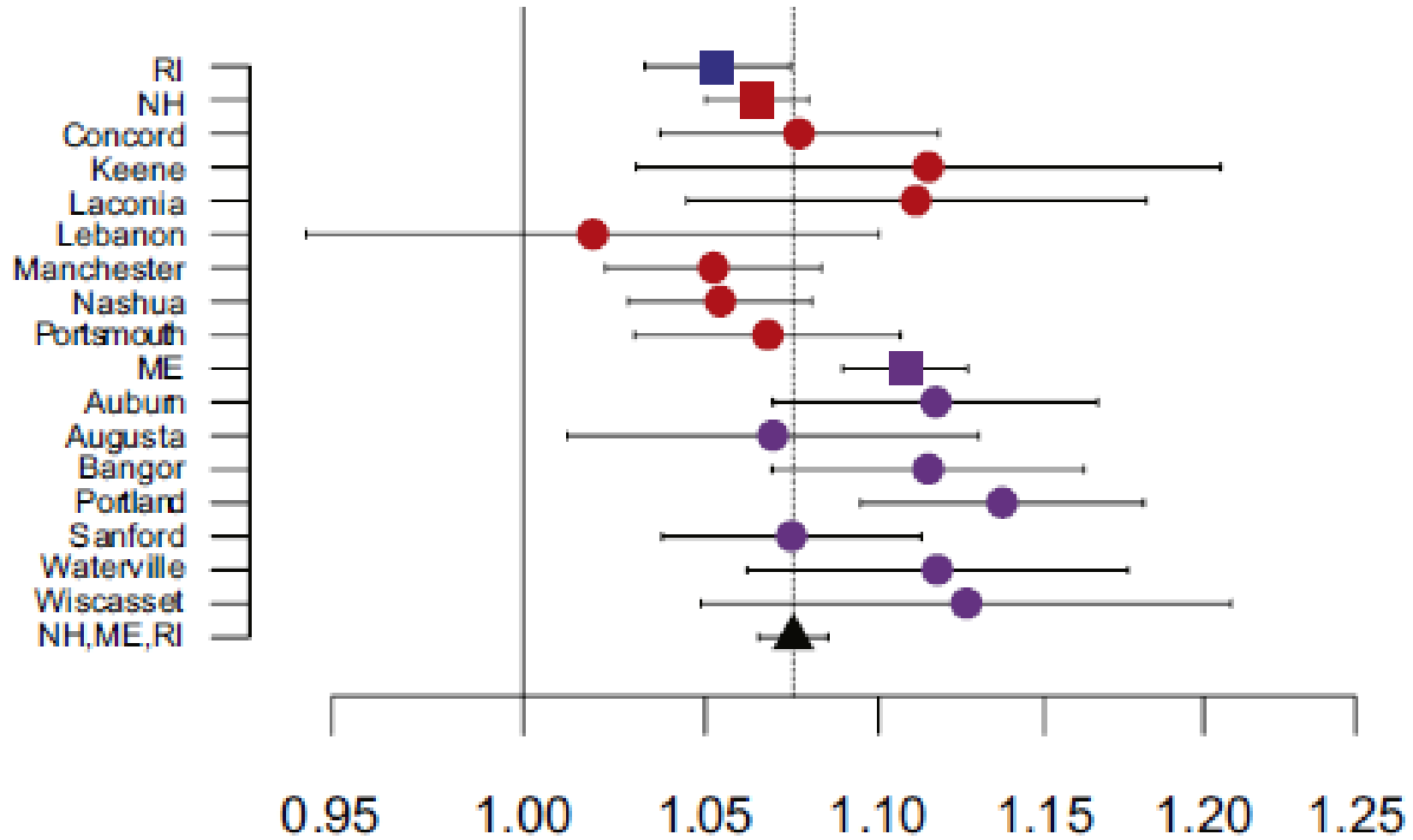
- Counts of daily all-cause and heat-specific emergency department (ED) visits
- Counts of daily all-cause deaths

Heat and Health – Estimating risk

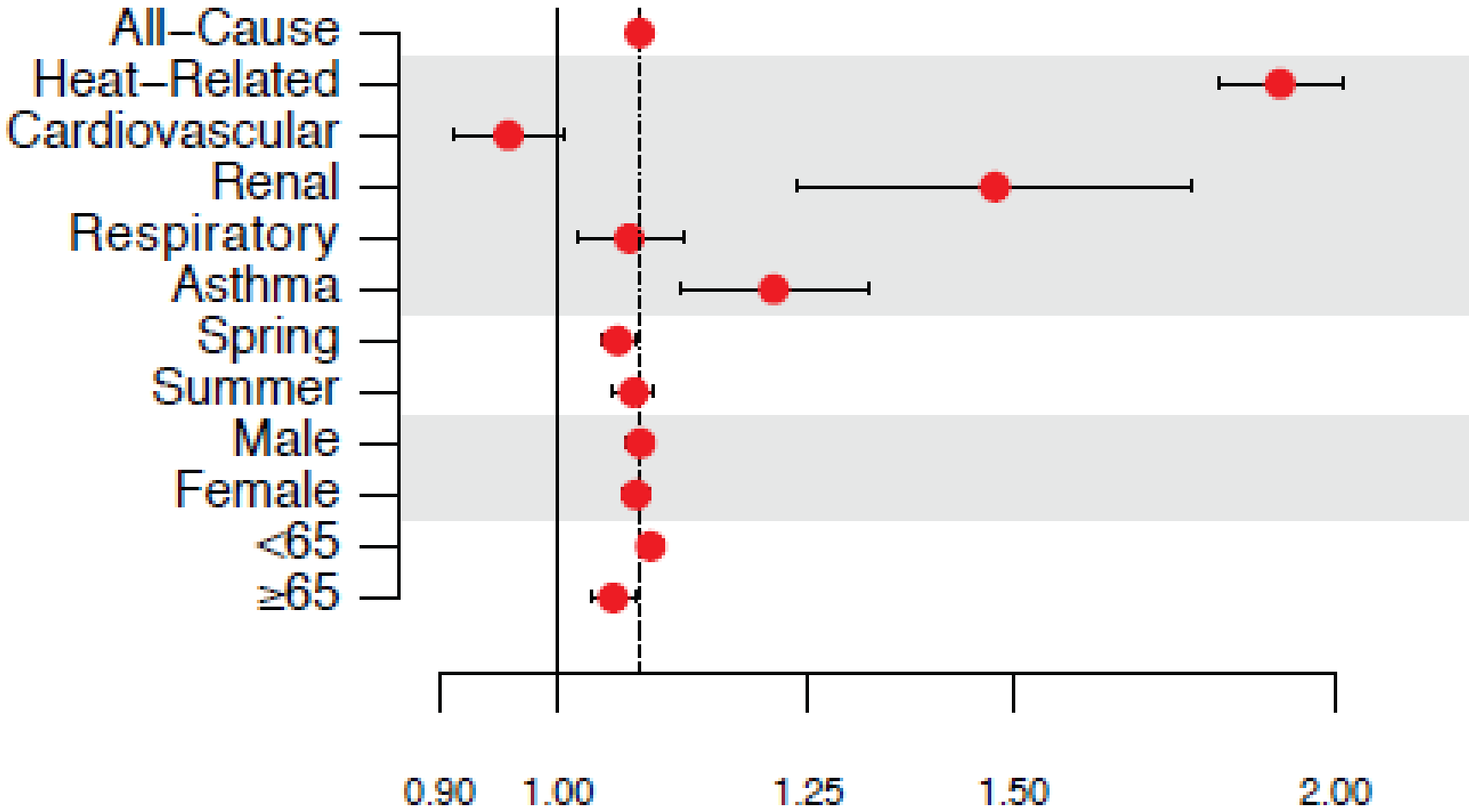
Risk of All-Cause ED Visits Over 1-week Lag 95F vs. 75F



Risk of All-Cause ED Visits by Study Location



Risk of All-Cause ED Visits by Cause, Season and Demographics



Summary of Results

For a day when the max heat index was 95oF (compared to 75oF):

- All-cause ED visits ↑ 6.6% over the following 7 days
- Heat-related ED visits ↑ 89% over the following 7 days
- Deaths ↑ 5.8% on the same day

Key point: Health effects occur at ‘moderate’ heat index below the current NWS threshold for a Heat Advisory.

Policy Change

OLD NWS THRESHOLDS FOR NORTHEAST

HEAT ADVISORY

100° - 104°F*

*For 2 or more hours

HEAT WARNING

105°F and above

HEAT WAVE

3 consecutive days 90°F or higher

NEW NWS THRESHOLDS FOR NORTHEAST

HEAT ADVISORY

95-104°F*

For 2 or more consecutive days, or 100-104°F for any length of time

HEAT WARNING

105°F and above

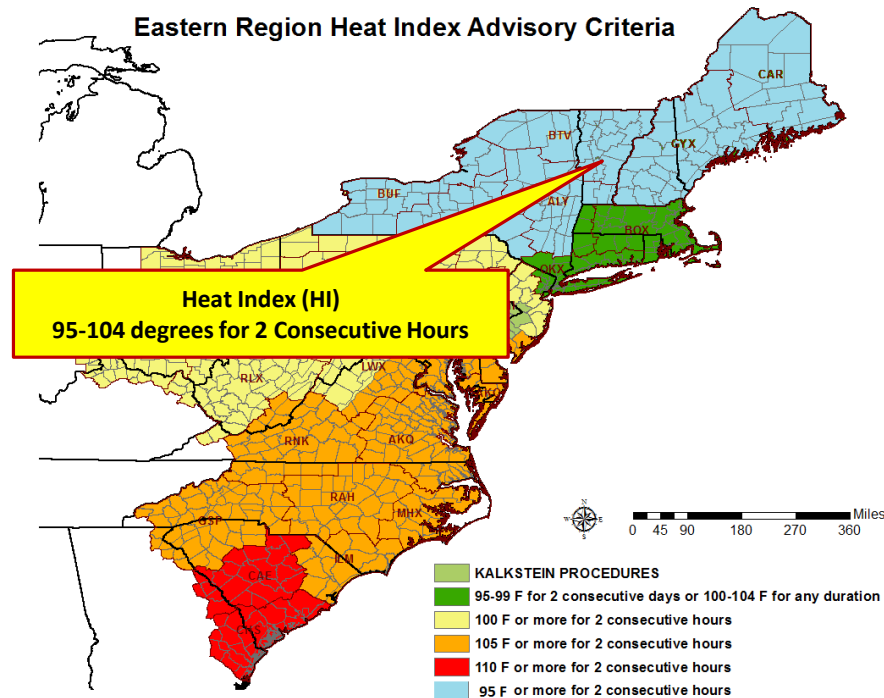
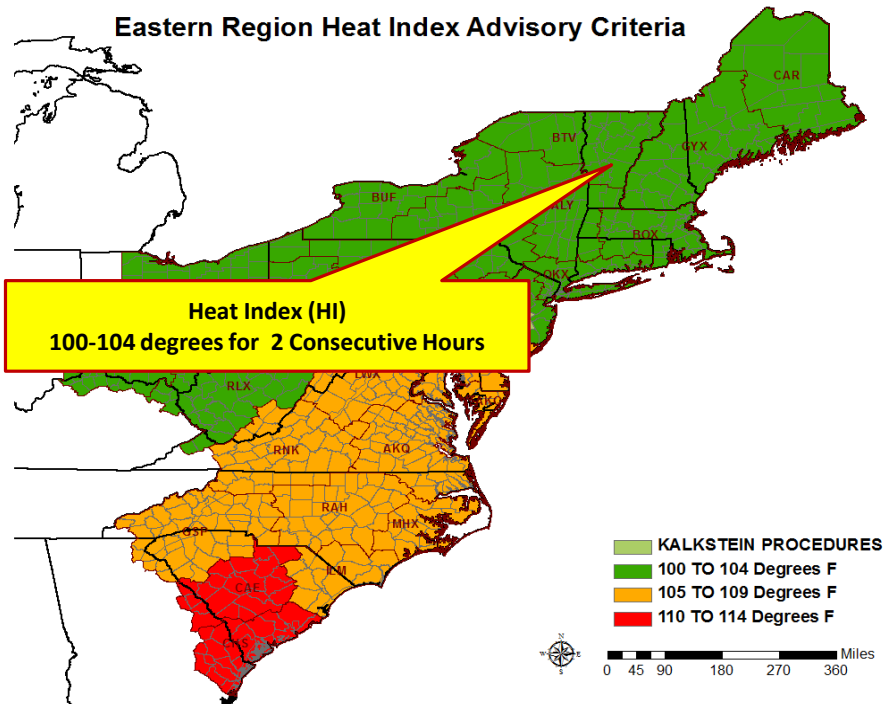
HEAT WAVE

3 consecutive days 90°F or higher

NWS Eastern Region Heat Advisory Criteria

2016

2018



State and Local Action

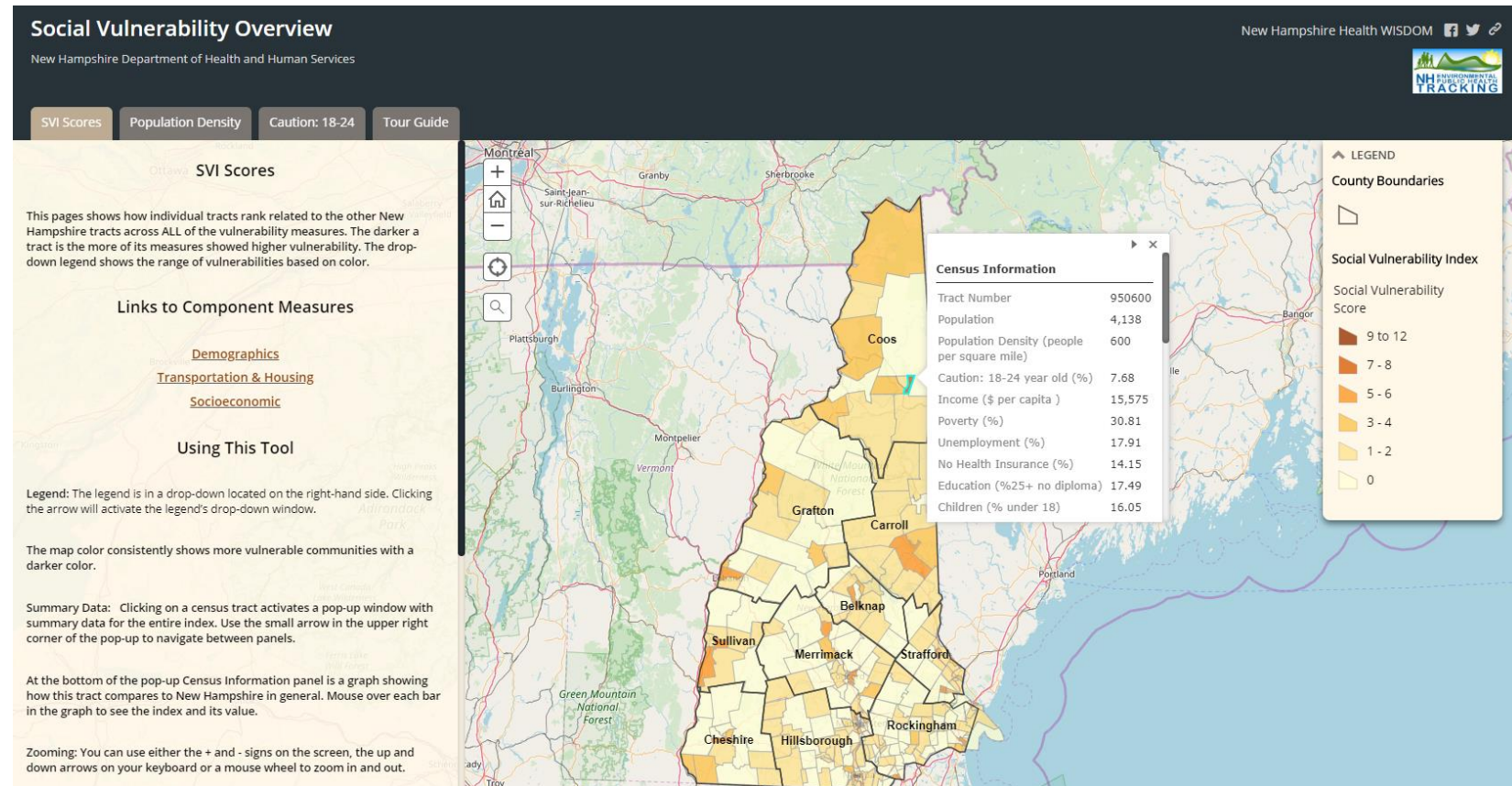
What are we doing to prepare for and respond to Extreme Heat Events?

- Heat Response Plan
- Hazard Mitigation Plans
- Climate and Health Adaptation Plans & Interventions



Tools to Support this Work

NH Social Vulnerability Index (SVI) - Overall Social Vulnerability Score



<http://nhvieww.maps.arcgis.com/apps/PublicGallery/index.html?appid=38764e6f2a894165a60dd5c983543221>

Tools to Support this Work

The screenshot shows the NH Health WISDOM website. At the top, there is a navigation bar with a search box, user profile, and language options. Below the navigation bar is a header section with the WISDOM logo and the tagline "Connecting NH to Health Data". A "Quick Tour Video" player is visible in the top right corner. The main content area is divided into two columns: "State Health Improvement Priorities" and "State Initiatives".

State Health Improvement Priorities

- Asthma
- Cancer
- Healthy mothers and babies
- Heart disease and stroke
- Injury prevention
- Misuse of alcohol and drugs
- Obesity/Diabetes
- Tobacco Use

State Initiatives

- NH Environmental Public Health Tracking Program (highlighted with a purple oval)
- Per- and Polyfluoroalkyl Substances (PFAS) Blood Testing and Community Exposure
- Health Equity
- NH Youth Risk Behavior
- Occupational Health Surveillance Program

NH Health

- [NH Department of Health and Human Services \(DHHS\)](#)
- [NH Division of Public Health Services \(DPHS\)](#)
- [The New Hampshire State Health Improvement Plan \(NH SHIP\)](#)

Centers for Disease Control and Prevention

- [CDC National Center for Health Statistics](#)
- [CDC Wonder Online Databases](#)

Health Data Resources

- [NH HealthWRQS Behavioral Risk Factor Surveillance System \(BRFSS\) Report Module](#)
- [NH Medicaid Quality](#)
- [NH Social Vulnerability Index](#)
- [NH WIC Pediatric Nutrition Surveillance Survey \(PedNSS\)](#)
- [Map NH Health](#)

Available Datasets

NH Health WISDOM aggregates public health data from 15 data sources to produce custom reports, maps and time trend analyses.

[Datasets](#)

Tools to Support this Work

The screenshot displays the NH Health WISDOM website. At the top, there is a navigation bar with a search box, language options (English, Spanish, French, German), and social media icons. Below the navigation bar, the main heading reads "Environmental Public Health Tracking" with the tagline "Making the Connection between Health and Environment". The page features a "News" section with a link to "Introducing Community Health Outlooks". A central grid of 12 tiles provides quick access to various tracking tools, including: Tracking Air Quality, Tracking Childhood Lead Poisoning, Tracking Heart Disease, Tracking Asthma and COPD, Tracking Climate Change, Tracking Life Expectancy, Tracking Birth Conditions and Outcomes, Tracking CO Poisoning, Tracking Radon, Tracking Cancer, Tracking Drinking Water, and Tracking Tickborne Disease. At the bottom, there is a section for "Environmental Public Health Tracking Related Links" with links to the National Environmental Public Health Tracking Network, the Centers for Disease Control and Prevention, and the Social Vulnerability Index. A logo for the CDC's National Environmental Public Health Tracking program is also present.

Access at: wisdom.dhhs.nh.gov

State Portals Provide Local Data & Information

State	Heat-related Tools	URL
MA	Heat Vulnerability Index	matracking.ehs.state.ma.us/ Climate-Change/map-hvi.html
ME	Air Conditioning Data by County & Housing Status	data.mainepublichealth.gov/ tracking
NH	Heat Community Toolkit	nh.gov/epht/documents/heat- community-toolkit-final.pdf
RI	Interactive Heat Stress & Daily Temp Data Visualization	health.ri.gov/data/heatstress
VT	Heat Vulnerability Index	healthvermont.gov/tracking/ vulnerability-indicators

**Thank you.
Remember – we're hiring!**

Questions? Comments? Feedback?

**Katie Bush, PhD
EPHT Program Manager
NH DHHS DPHS
Phone: 603-271-1106
Email: kathleen.bush@dhhs.nh.gov**

Acknowledgements and References

Thanks to BRACE and EPHT colleagues who supported this initiative.

Thanks also to the US Centers for Disease Control and Prevention for supporting this work through several Cooperative Agreements: 5UE1EH001040, 5U38EH000947, 5UE1EH001046, 5UE1EH000745, and 5U38EH000943. The content is solely the responsibility of the authors and does not necessarily represent the official views of sponsoring agencies.

For the full manuscript see:

Wellenius, G.A., Heat-related morbidity and mortality in New England: Evidence for local policy. Environmental Research (2017), <http://dx.doi.org/10.1016/j.envres.2017.02.005>

Janine Marr, MS

Graduate Research Assistant for the Building Resilience Against Climate Effects (BRACE) project with the Greater Monadnock Public Health Network in Cheshire County



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Building Resilience Against Climate Effects in the Monadnock Region of New Hampshire:

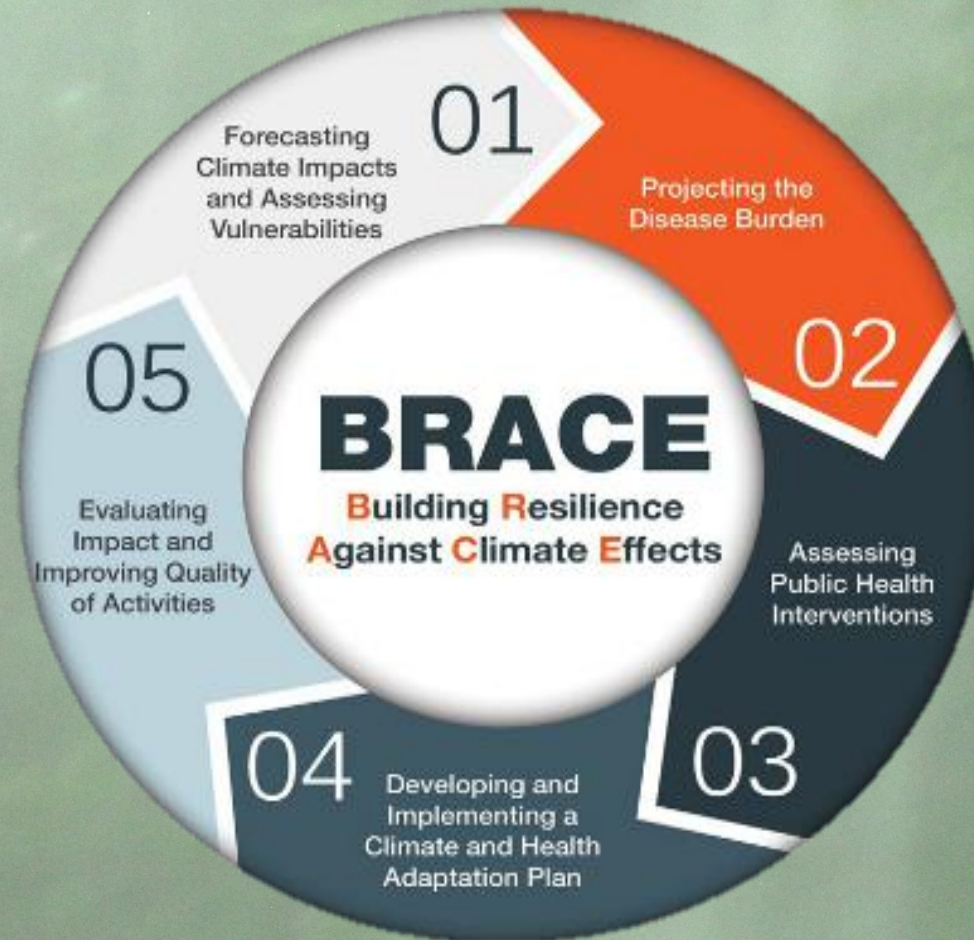
How to Increase the Resiliency of People Over 65
& Reduce Health Risks Associated with Extreme Precipitation Events
Through Community Engagement and Behavior Change

Presented by Janine Marr
Antioch University New England
Center for Climate Preparedness & Community Resilience

1/9/20

BRACE Stages in the Monadnock Region:

1. EXTREME
PRECIPITATION
EVENTS &
OLDER ADULTS



2. CONTAMINATION,
POISONING, INJURY,
DEATH

5. ASSESS PILOT
& INFORM 2020
INTERVENTION

3. EVIDENCE-BASED
INTERVENTIONS:
EMERGENCY
PREPAREDNESS

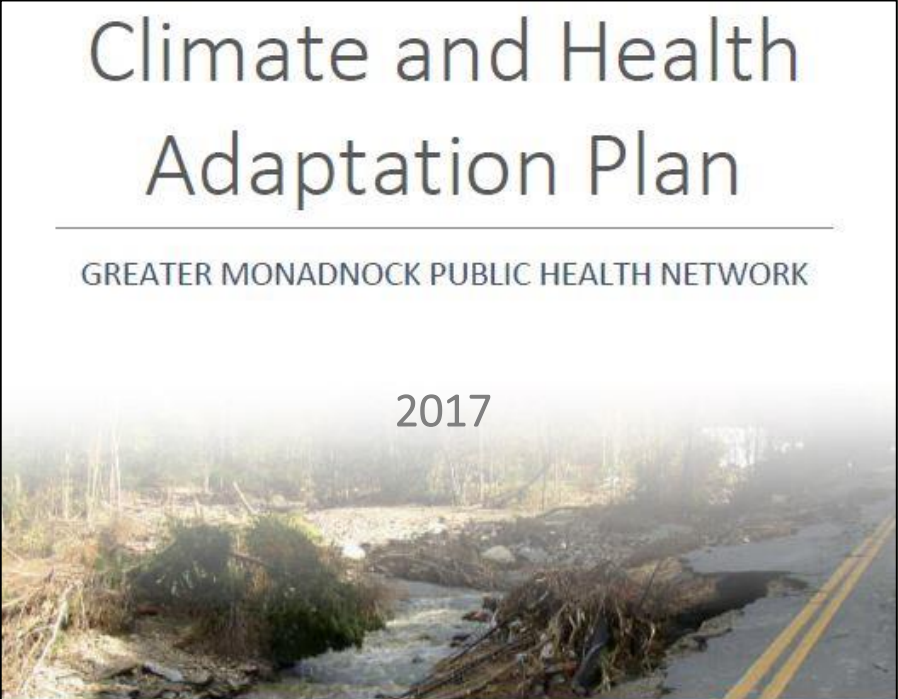
4. CHAP (1/17) & PILOT INTERVENTION (SPRING 2019)

BRACE Partnership in the Monadnock Region

Climate and Health Adaptation Plan

GREATER MONADNOCK PUBLIC HEALTH NETWORK

2017



This publication was supported by Centers for Disease Control and Prevention (CDC) grant number #5UE1EH001046-03 via the National Center for Environmental Health in Atlanta, Georgia.

Greater Monadnock Public Health Network:
Cheshire County
Cheshire Medical Ctr./Dartmouth-Hitchcock Keene
Community Volunteer Transportation Services
Home Healthcare, Hospice, & Community Services
Monadnock Community Hospital
Monadnock Voices for Prevention
Southwestern Community Services

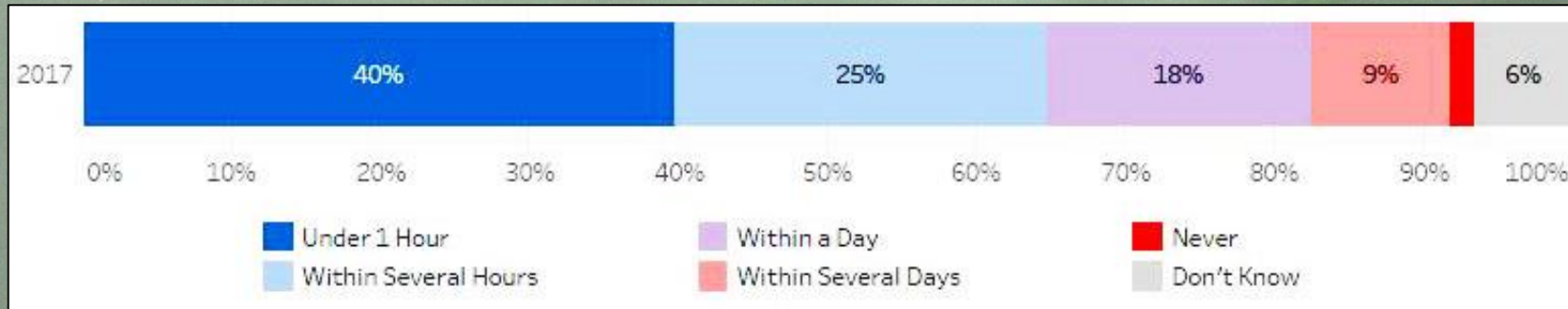
NH Department of Health & Human Services
Southwest Region Planning Commission
Antioch University New England

<http://www.swrpc.org/chap>

The Challenge

1. Aging Population
2. Year-Round Extreme Precipitation Events
3. Reliance on Volunteers
4. Misperceptions about Disaster Response:

How long do you believe it will take 1st responders to arrive?



McKinley, S. P., Azem, Z. S., & Keirns, T. (2017). *Healthy Monadnock 2017 Community Survey* (p. 111). The Survey Center: University of New Hampshire.

CHAP Social Vulnerability Index



Extreme Precipitation & Weather Events

Riverine Residents
Community Housing
Health Issues
Mobility Issues (Car)
Low-Income

Keene
Hinsdale
Marlborough
Troy
Peterborough

Exposure + Sensitivity
+ Adaptive Capacity
= Social Vulnerability

Objective: Increase the level of individual resilience to the stressors of extreme precipitation.

Community Engagement: Stakeholder Sessions

What programs/tools would reduce health issues caused by extreme weather events?

Public Health Advisory Council/Leadership Council for a Healthy Monadnock

Keene Energy & Climate Committee

Monadnock Area Fire Chief's Association

EMS Chiefs

Regional Coordinating Council

Monadnock Region Healthcare Workforce Group

Cheshire Village at Home

Monadnock at Home

Keene Senior Center in Keene

Friendly Meals in Keene & Hinsdale

Meals on Wheels in Peterborough



"I won't leave without my dog."

Stakeholder Sessions: Intervention Support

Potential Interventions:



Transtheoretical Model of Behavior Change

(Prochaska and DiClemente, 2002)

PRECONTEMPLATION “I don’t need to ...”

CONTEMPLATION “I intend to within six months...”

PREPARATION “I am going to this month...”

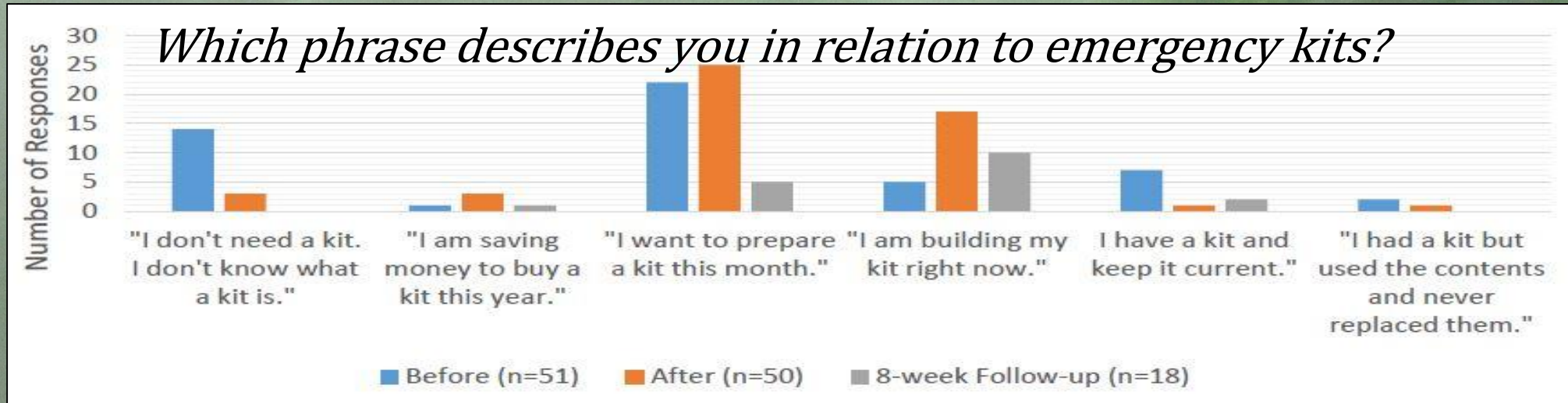
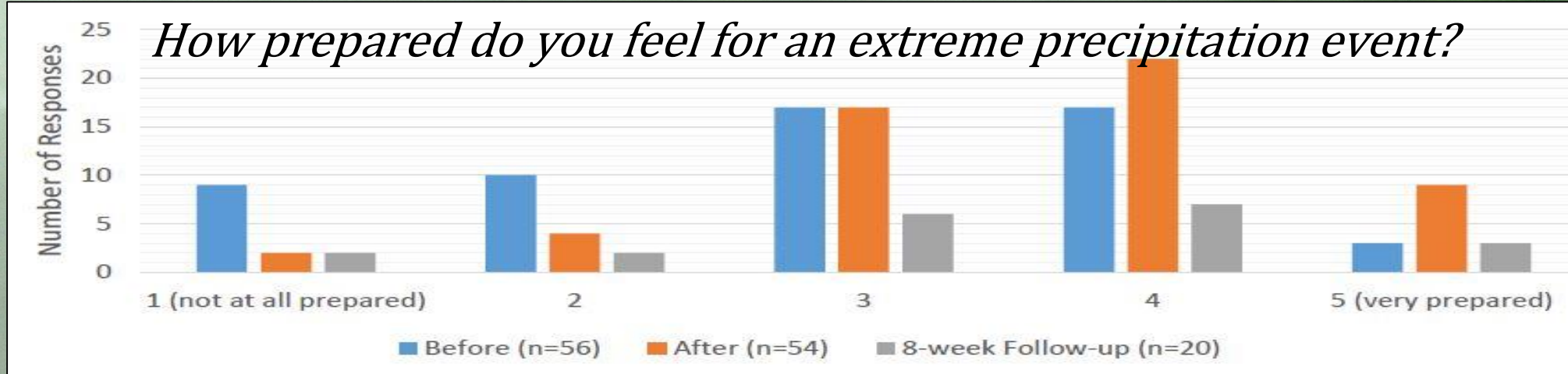
ACTION “I have a plan now...”

MAINTENANCE “I keep my plan current.”



“Sometimes we have to leave people to go to other calls...”

Emergency Preparedness Training Results:



Stakeholder Comments:

“Empower citizens or communities to help themselves.”

“A lot of people don’t have back-up generators for oxygen.”

“No one identifies as having needs until a problem occurs.”

“I don’t know who to call to get help.”

“What convinced me to leave my house was a boat came by my window.”



Climate Impacts: Public Health

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ANTIOCH UNIVERSITY NEW ENGLAND
Center for Climate Preparedness
and Community Resilience

Local Solutions for Strong Communities

... a series of online courses focused on the fundamentals of climate change resilience.



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Save the Date!

Join us for the next webinar in the series

February 27, 2020 12:00-1:15 PM EDT

Registration is now open -

<https://attendee.gotowebinar.com/register/4661565767474658571>