Climate Change, Heat and Mortality in New York City

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CLIMATE CHANGE

- Rising Temperatures
- Sea Level Rise
- More Extreme Events

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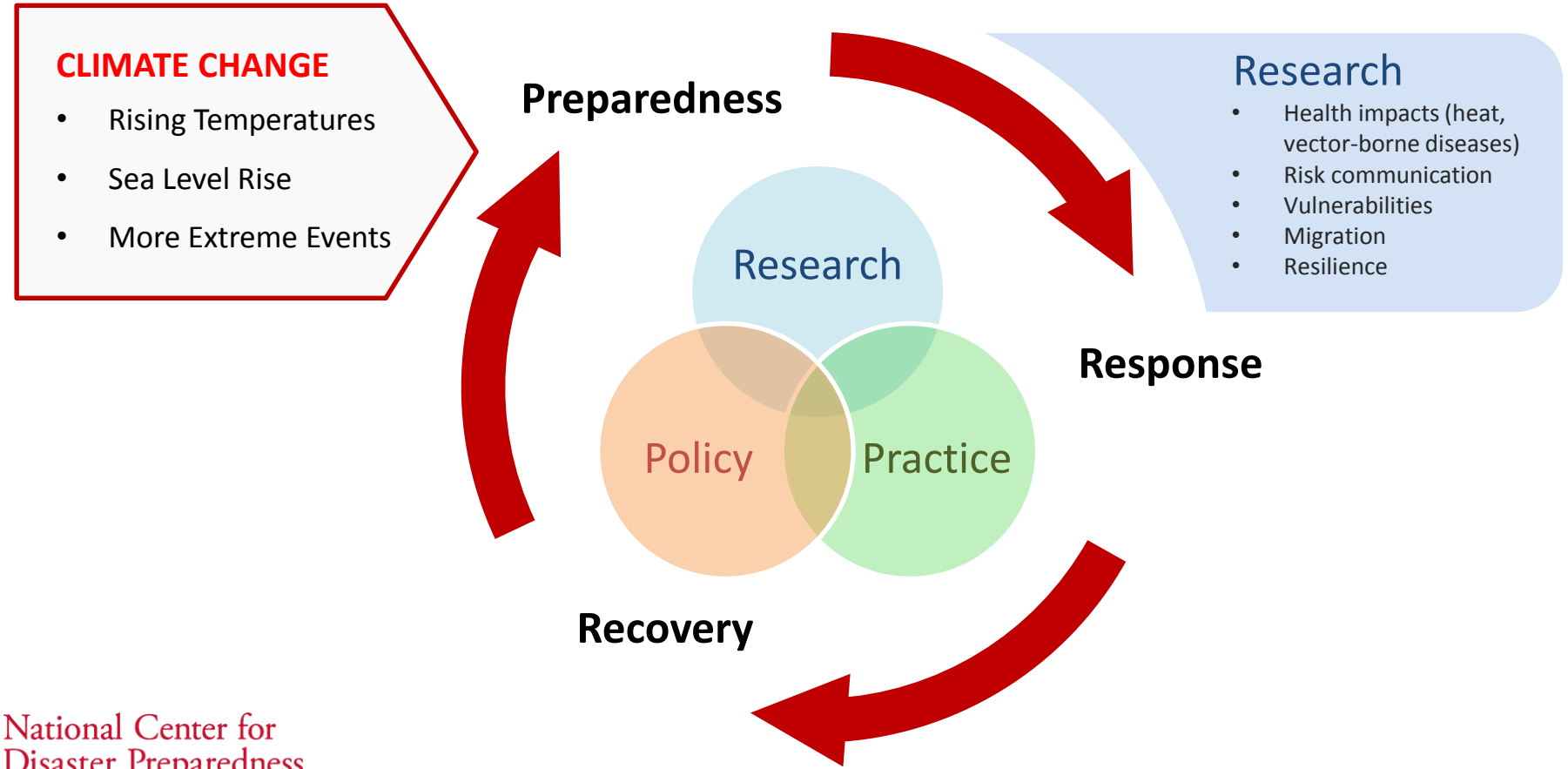

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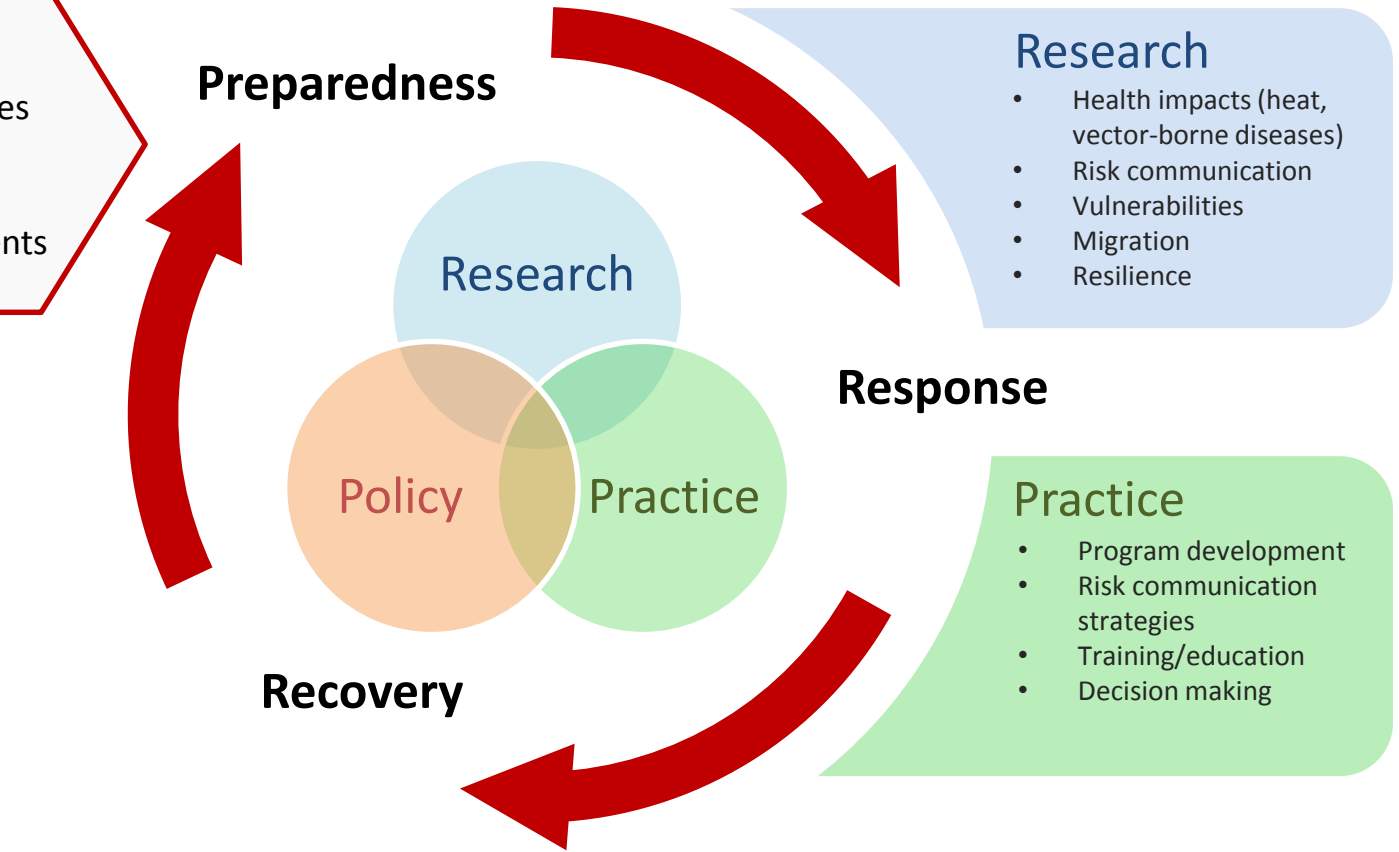

Research

- Health impacts (heat, vector-borne diseases)
- Risk communication
- Vulnerabilities
- Migration
- Resilience

Practice

- Program development
- Risk communication strategies
- Training/education
- Decision making

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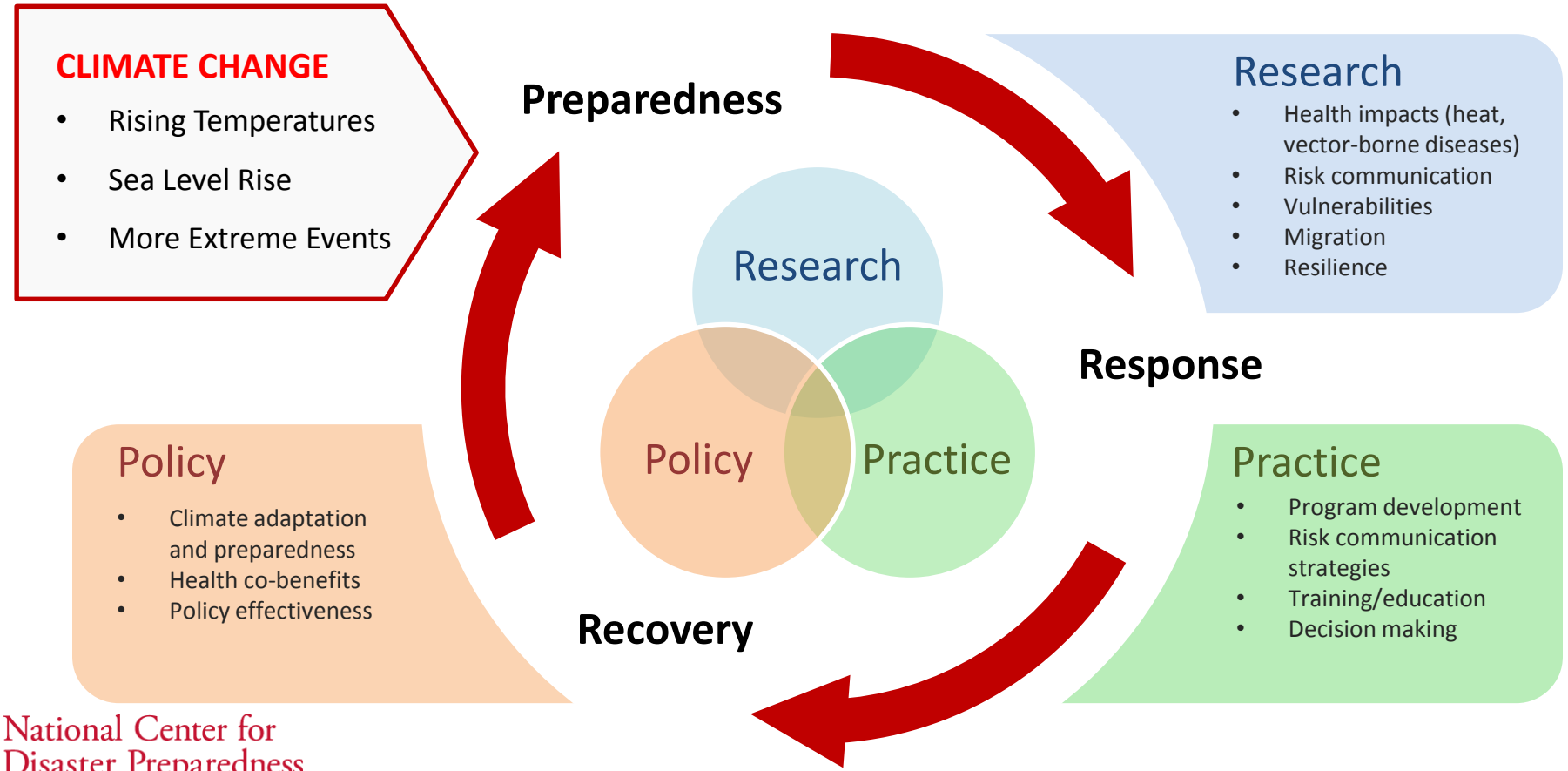

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Research and Communication Needs

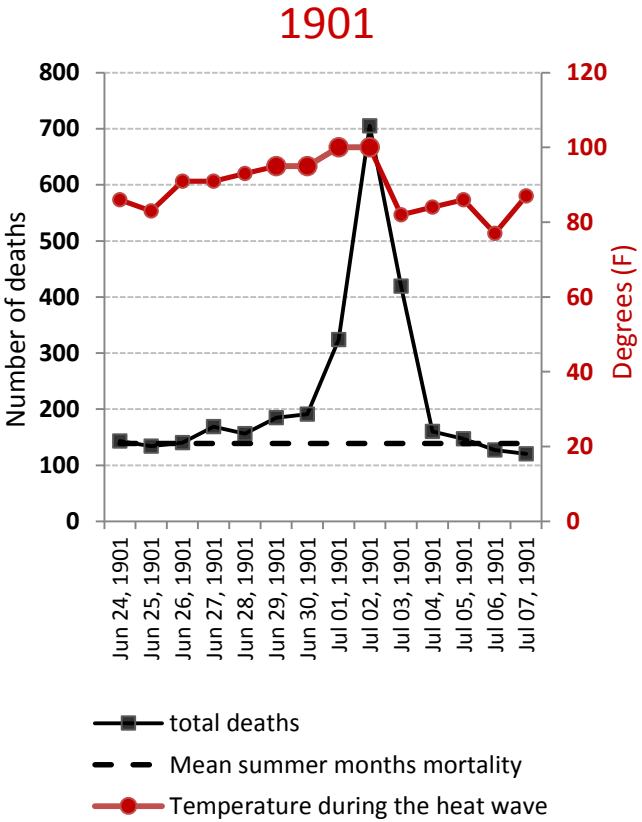
- **Forecasts** of how climate change will affect weather-related hazards
- **Studies** of population-level effects of climate-sensitive hazards, including both acute and long term physical and mental health impacts
- Identification of **measures** to mitigate and manage risks such as disease surveillance, implementation of preparedness measures and risk communication
- **Training** and seminars to inform disaster epi professionals about key issues and ongoing work on climate and health and vice versa

Questions

- What are some overlaps between climate change and health and disaster epidemiology?
- What practices could be applied across fields?
- What kind of climate information has been/would be especially helpful?
- Training/education/communication needs?

Heat and Mortality in New York City

Historical Impacts of Heat



Vulnerability and Protective Factors

Vulnerability Factors

- Age >65
- Obesity and diabetes
- Mental health conditions
- Socioeconomic status
- Urban heat island effect

Protective Factors

- Air Conditioning
- Urban heat island mitigation activities (green roofs, tree planting)

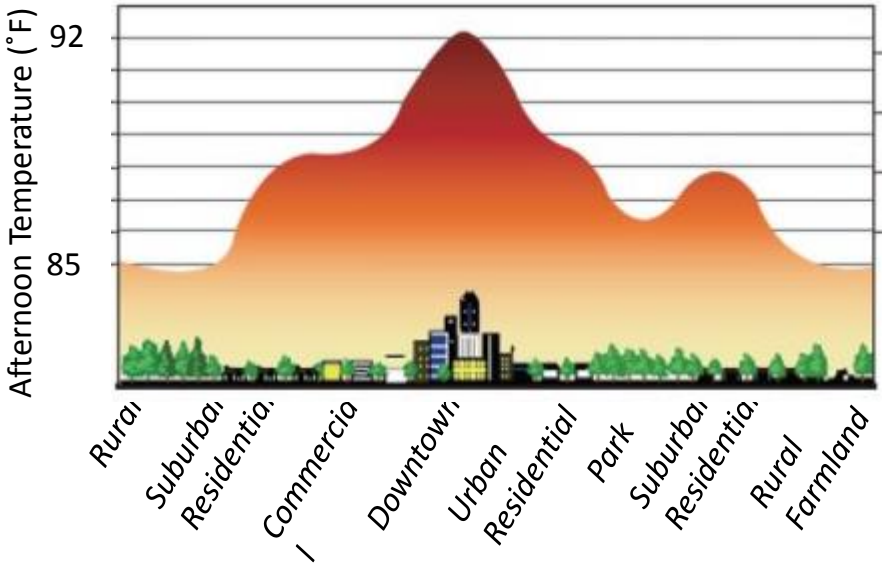
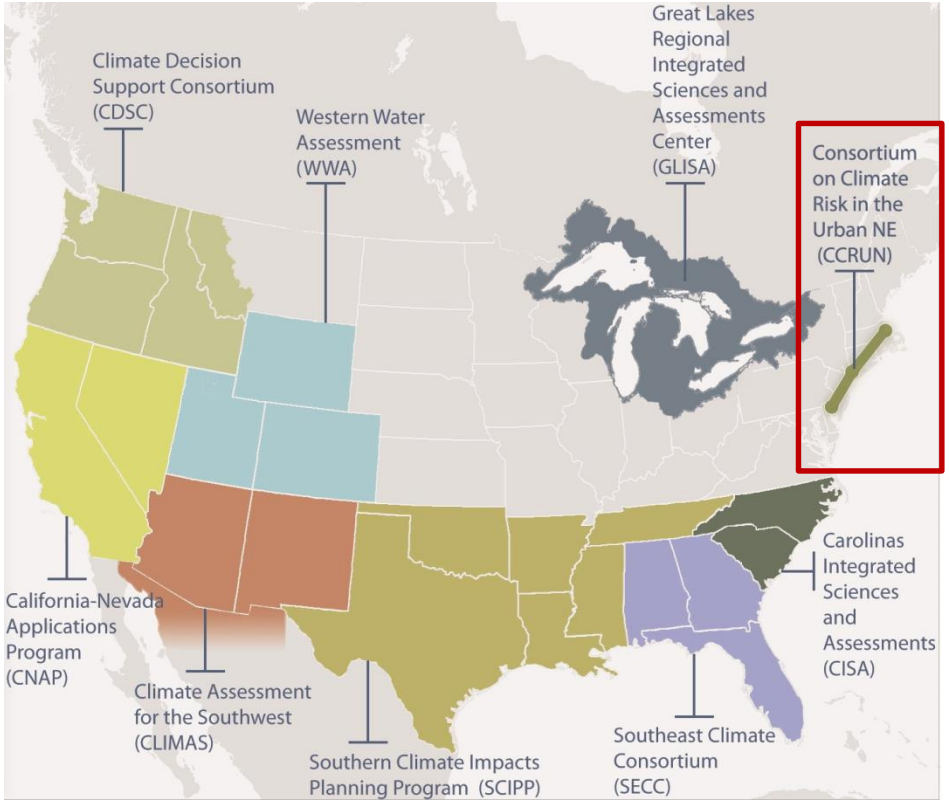


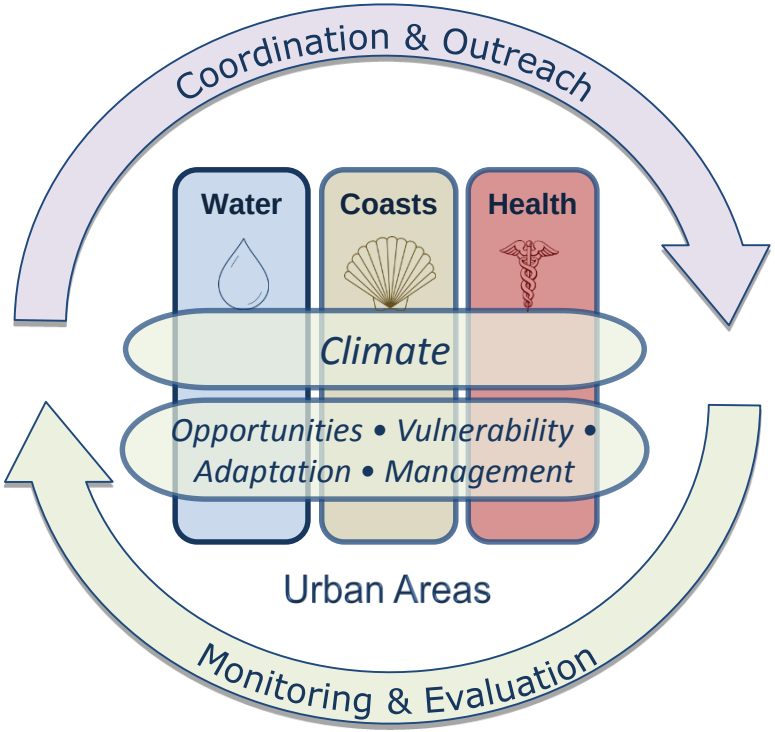
Figure 2. Urban Health island effect. *Reno, NV 28/10/ 2008*

Excess mortality is substantially greater in urban areas due to the combined effect of the ‘‘urban heat island’’ and socioeconomic deprivation in some urban neighborhoods.

Kinney at al. 2009 | Martiello & Giacchi 2010

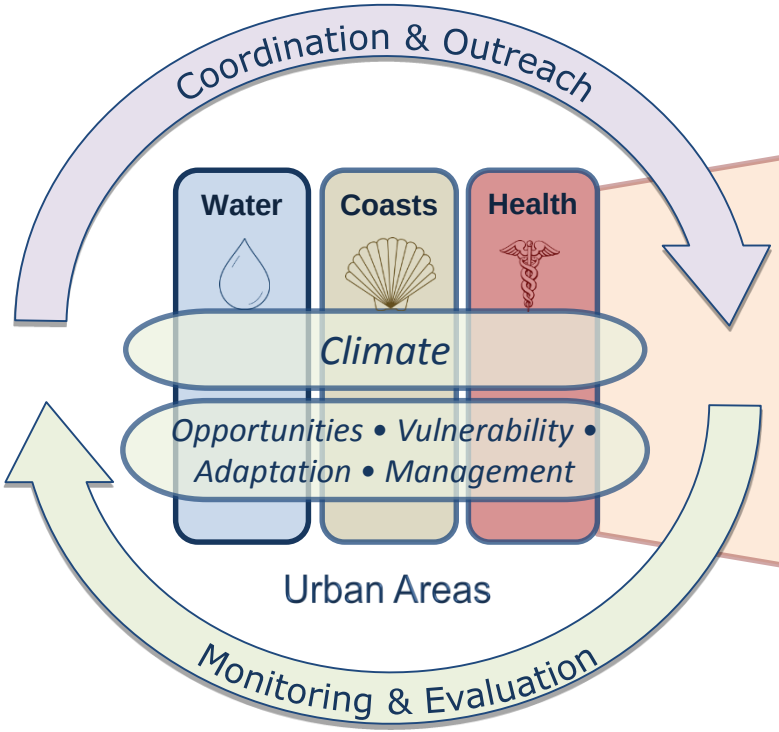
Consortium of Climate Risk in the Urban Northeast (CCRUN)





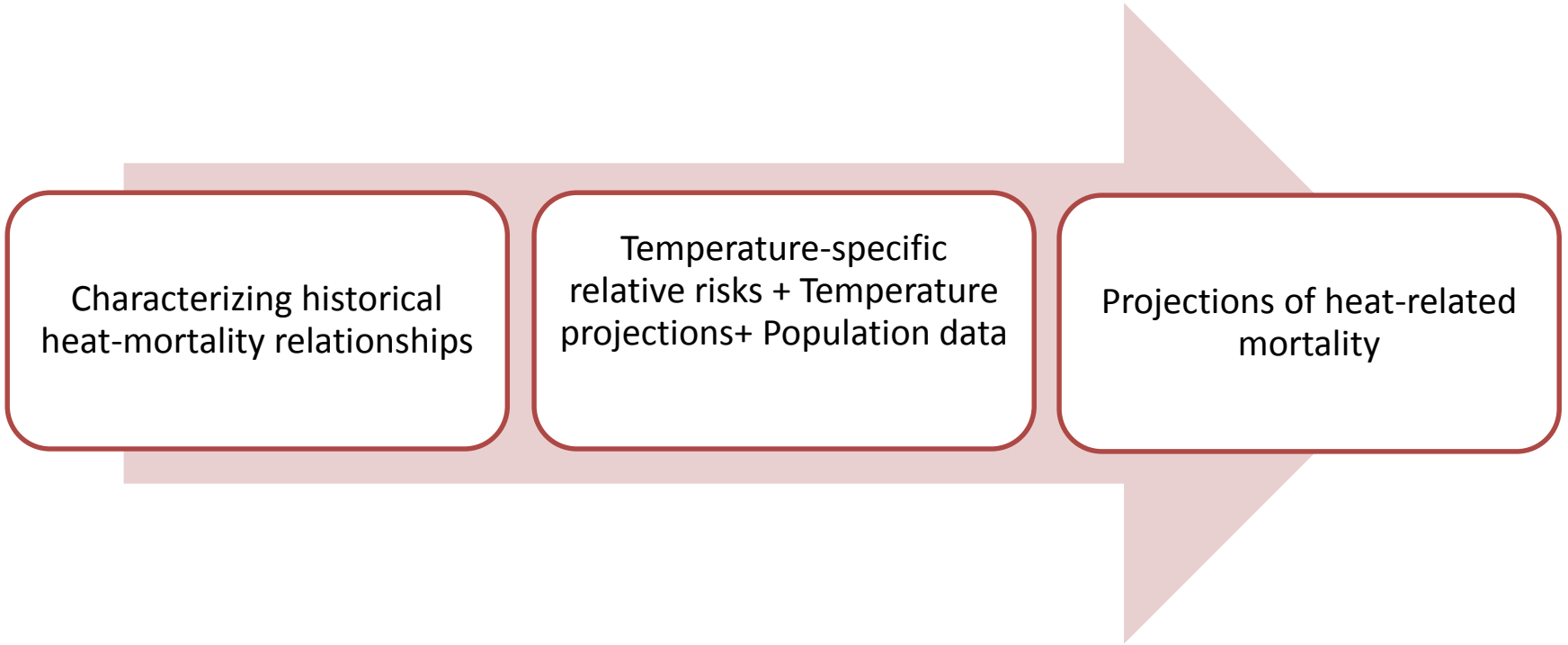
Chat2: Regional Integrated Sciences and Assessments (RISA) | Consortium for Climate Risk in the Urban Northeast (CCRUN)

CCRUN Health

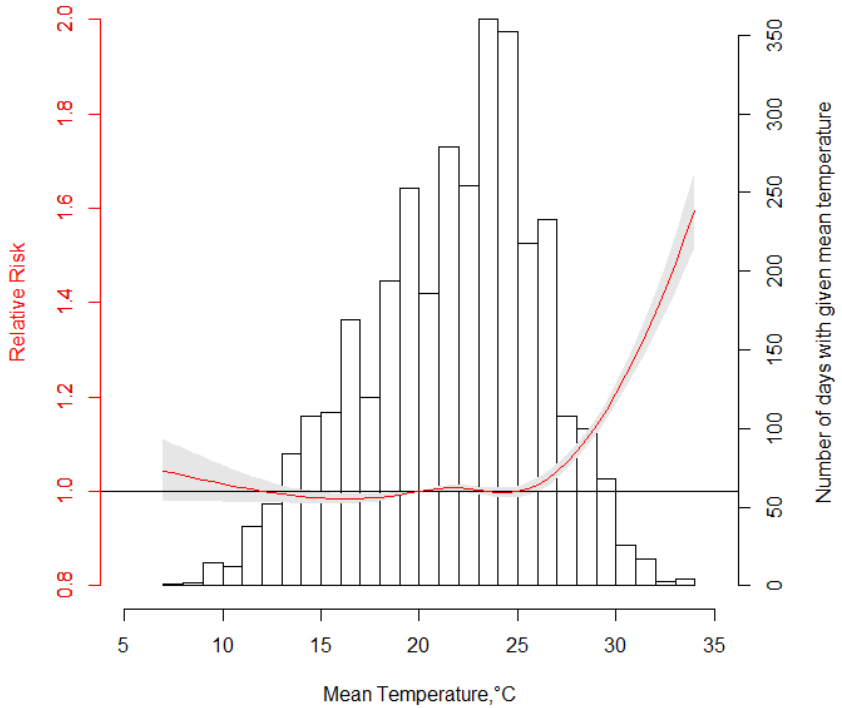


- Heat-related mortality and morbidity
- Water quality
- Air pollution
- Health co-benefits

Projecting Heat-Related Mortality



Historical Heat-Related Mortality



Temperature – mortality curves of overall cumulative relative risk and mean summer temperature histograms for New York City, based on data between 1985 and 2006.

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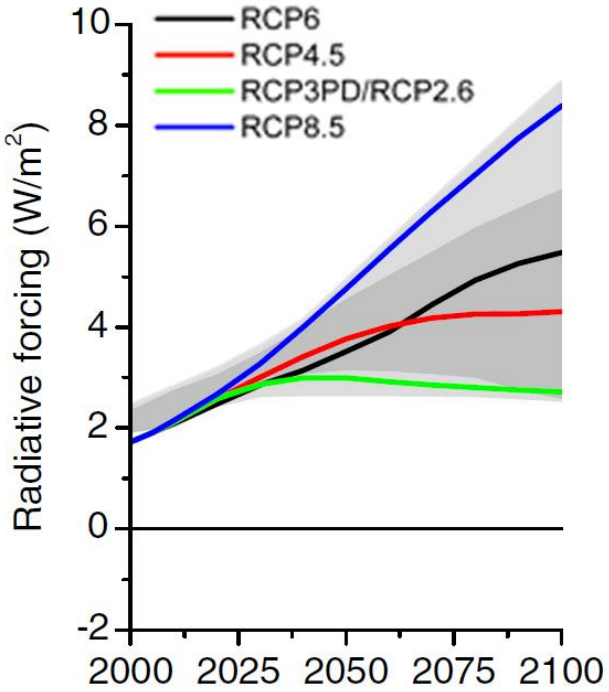
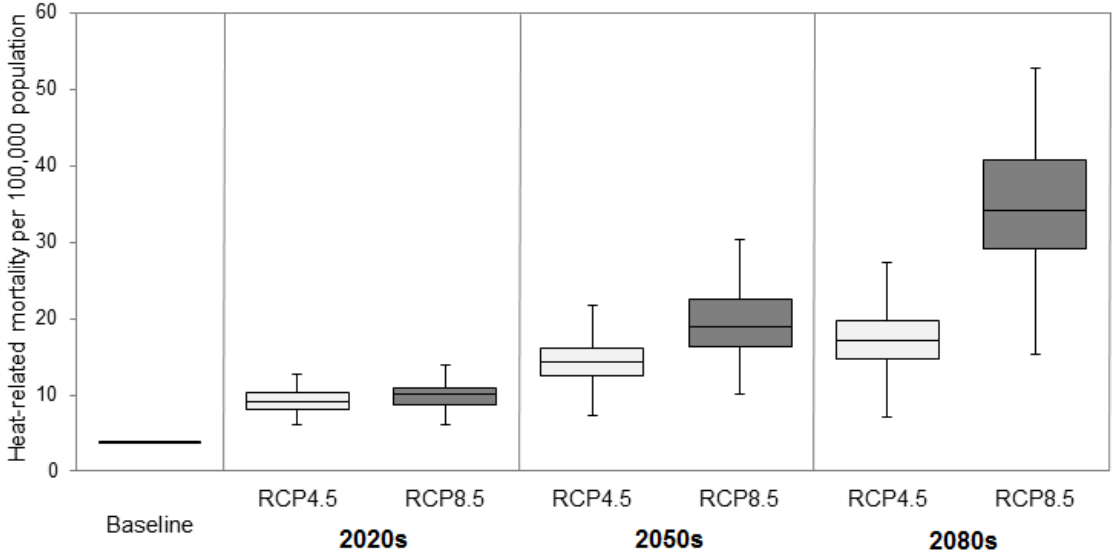
Petkova, Elisaveta P., et al. "Projected heat-related mortality in the US Urban Northeast." *International journal of environmental research and public health* 10.12 (2013): 6734-6747.

Temperature Projections



- New IPCC Fifth Assessment Report (AR5) RCPs replace emissions scenarios and make various underlying assumptions about radiative forcing, which is dependent upon future global greenhouse gas and aerosol concentrations
- Choice of RCPs for this study: RCP 4.5 and RCP 8.5, representing relatively low and high greenhouse gas projections
- 33 Global circulation Models used in the IPCC AR5

Projected Heat-Related Mortality



Projected annual heat-related mortality rates during the 2020s, 2050s and 2080s for New York City compared to the baseline period (1985-2006) and according to the 33 global climate models (GCMs) and two Representative Concentration Pathways (RCPs), RCP4.5 and RCP8.5.

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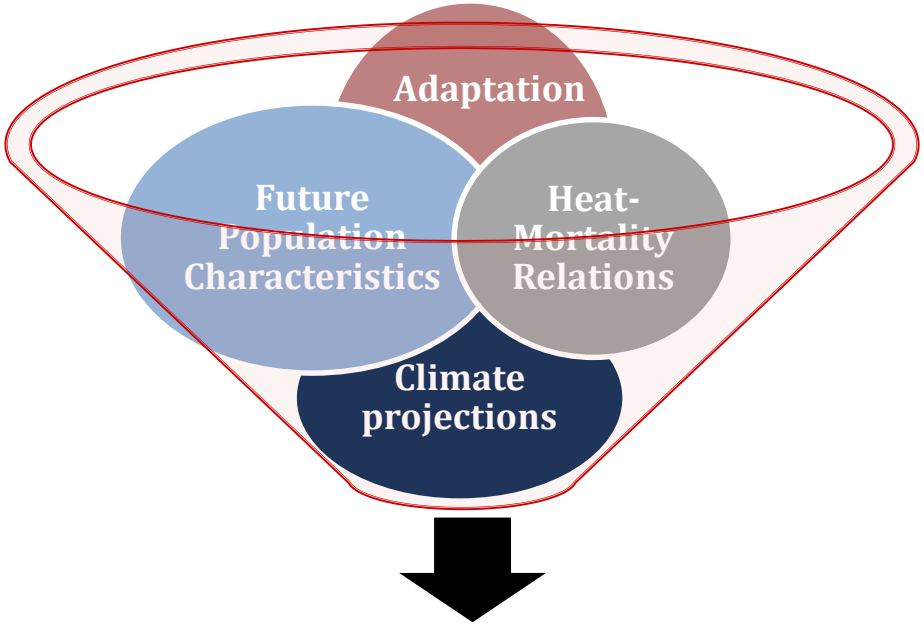
Towards More Comprehensive Projections



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Thank you!

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