EMORY
UNIVERSITY

Climate@Emory

Climate & Health

The role of public health in addressing "the defining issue for the 21st century"

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Emory University
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"Climate change is the defining issue for the 21st century."

- World Health Organization

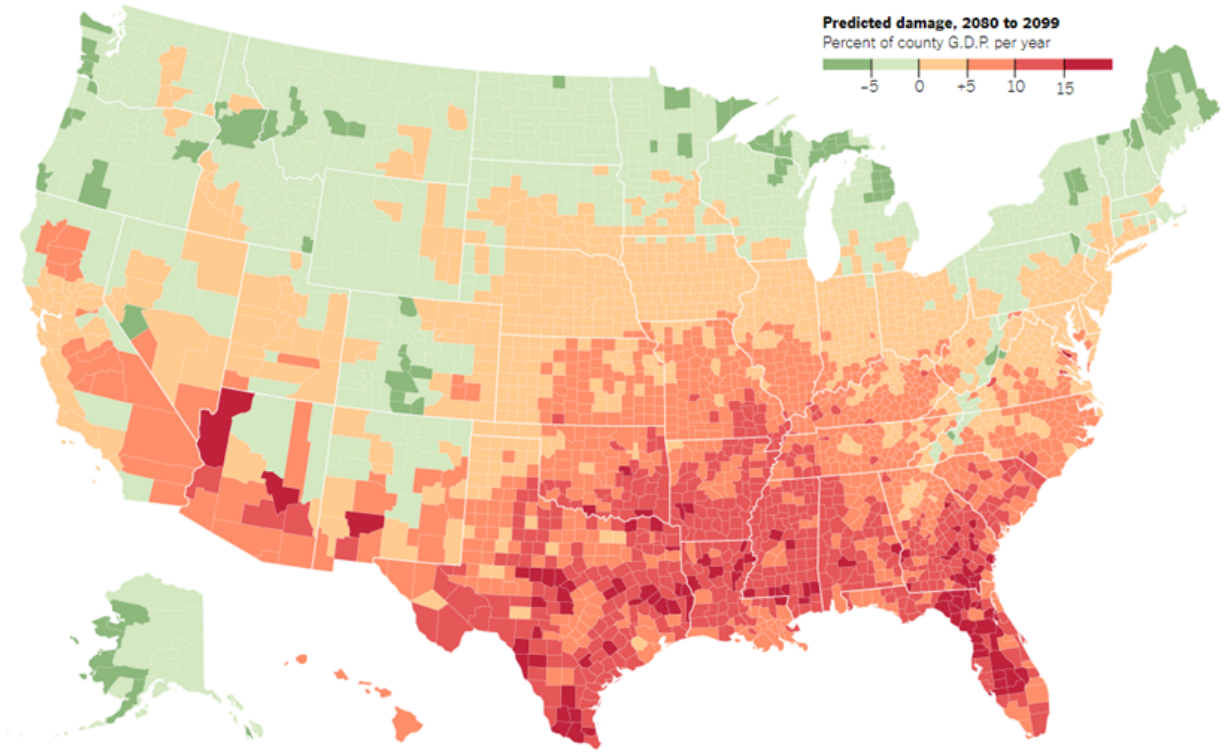
"Global climate change is a significant threat to international public health."

- Emory President Claire Sterk

The New York Times

As Climate Changes, Southern States Will Suffer More Than Others

By BRAD PLUMER and NADJA POPOVICH JUNE 29, 2017



As the United States confronts global warming in the decades ahead, not all states will suffer equally. Maine may benefit from milder winters. Florida, by contrast, could face major losses, as deadly heat waves flare up in the summer and

To do our part, we created Climate@Emory

EMORY UNIVERSITY

Climate@Emory

2014: bottom-up initiative

2015: 2 years of seed funding from then-Provost Sterk, 7 Deans

Now: 60+ Faculty/Staff from 20 Departments, 8 schools

http://earthobservatory.nasa.gov/Features/GlobalWarming/images/ISS022-E-6674.jpg

We are working to make a difference in three ways:

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

2015 – COP21 – Paris
9 students, 2 faculty

MARRAKECH COP22|CMP12
UN CLIMATE CHANGE CONFERENCE 2016

2016 – COP22 - Marrakech
6 students, 3 staff, 1 faculty

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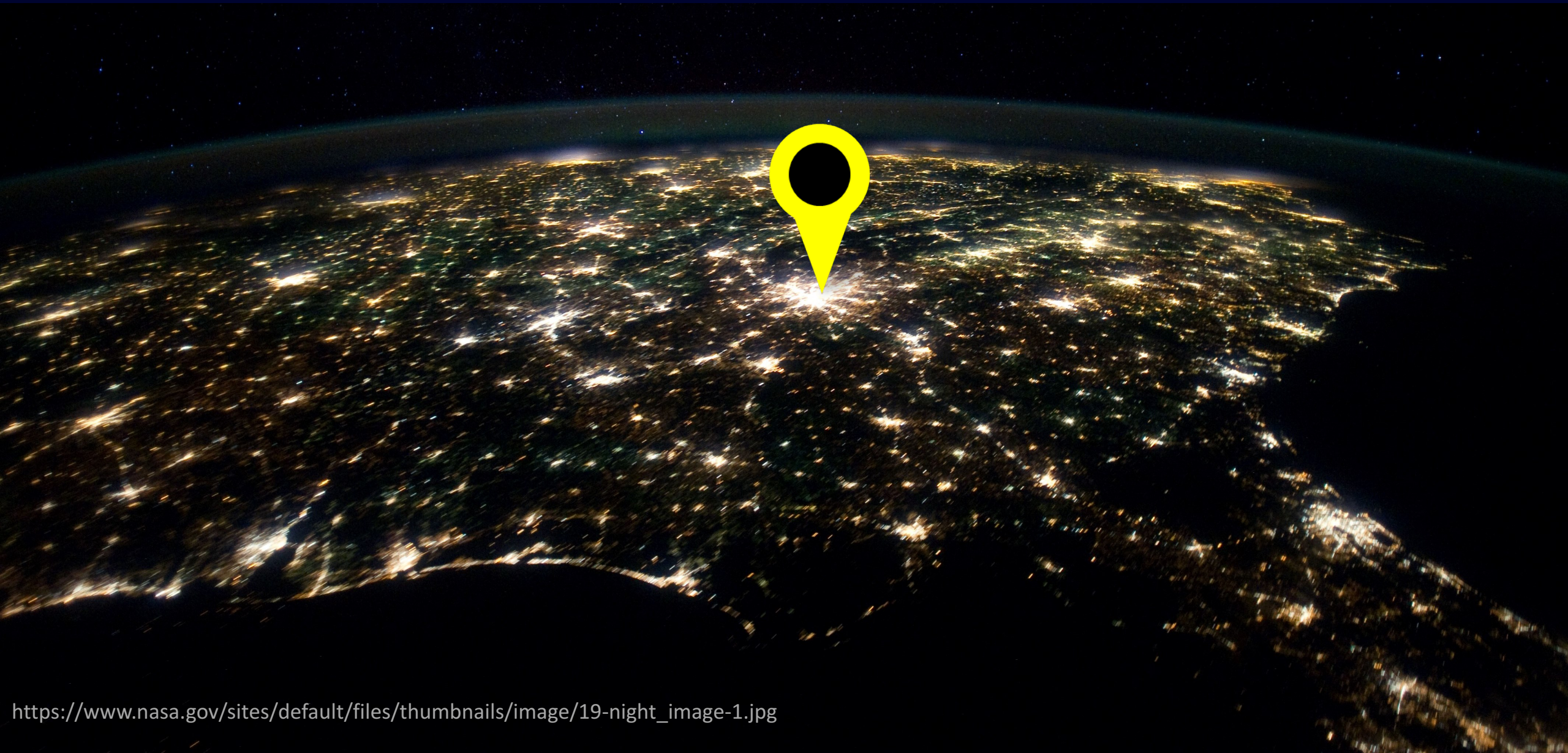
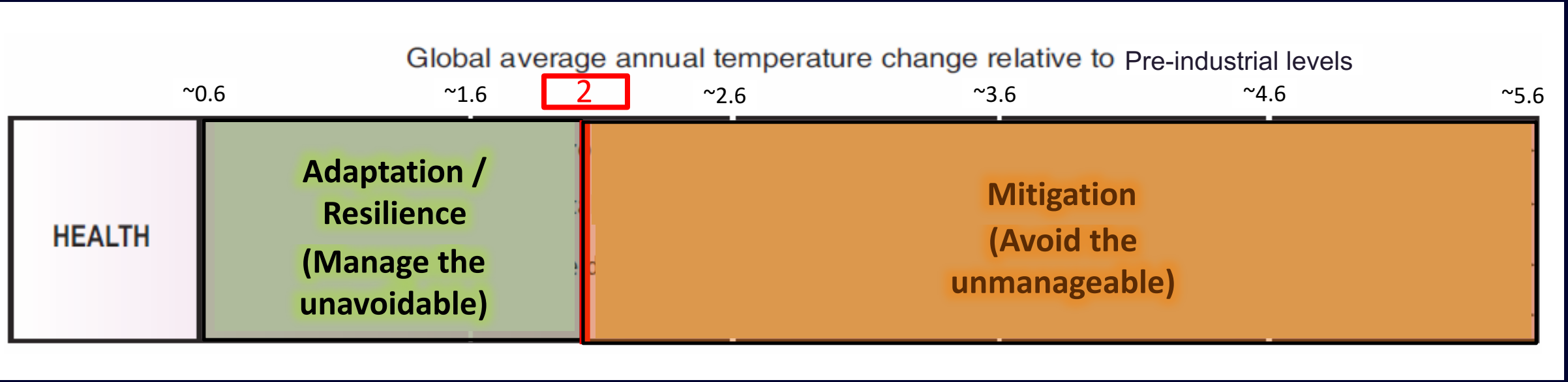
http://earthobservatory.nasa.gov/Features/GlobalWarming/images/ISS022-E-6674.jpg

Emory's work on climate and health



https://www.nasa.gov/sites/default/files/thumbnails/image/19-night_image-1.jpg

How can the public health community address climate change?



Modified from iPCC 4th Assessment Report (adjusted to pre-industrial baseline)

How can the public health community address climate change?

Adaptation / Resilience		Mitigation
Understand impacts	Implement responses	Strengthen case for action

	Adaptation / Resilience		Mitigation
Georgia	Understand impacts	Implement responses	Strengthen case for action
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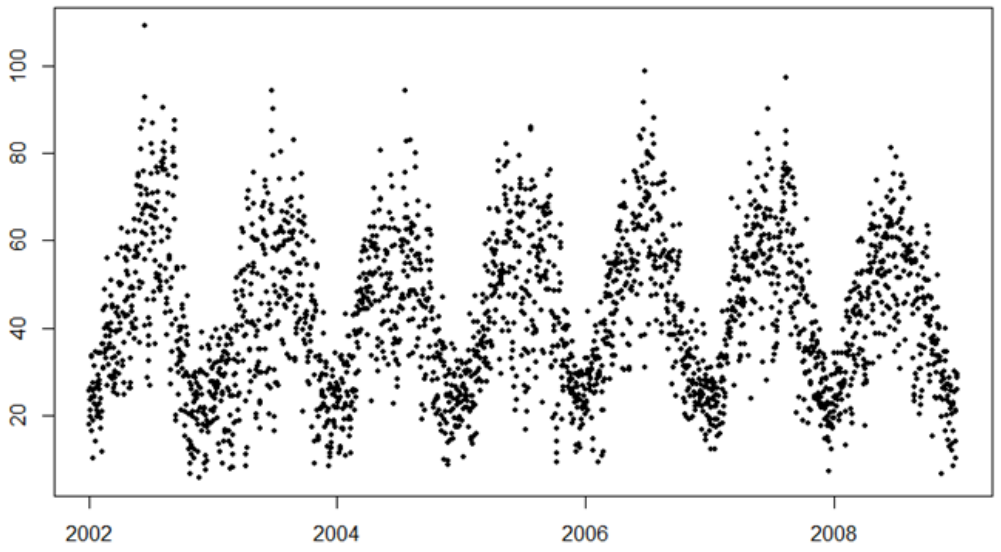
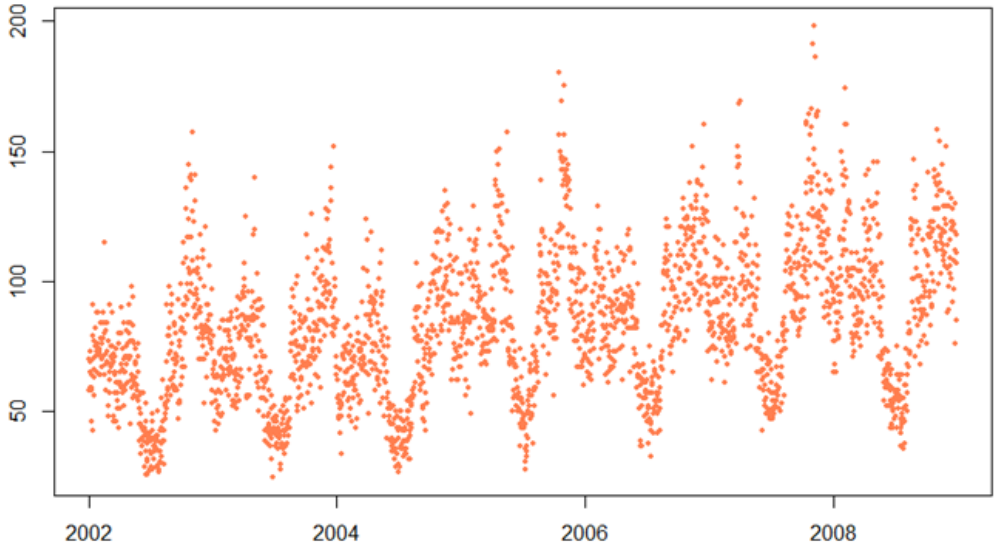
EXPOSURE:

Daily ambient ozone concentrations (in ppb) in Atlanta



HEALTH OUTCOME:

Daily counts of emergency department (ED) visits for asthma in Atlanta



Courtesy of Stefanie Sarnat, Rollins School of Public Health

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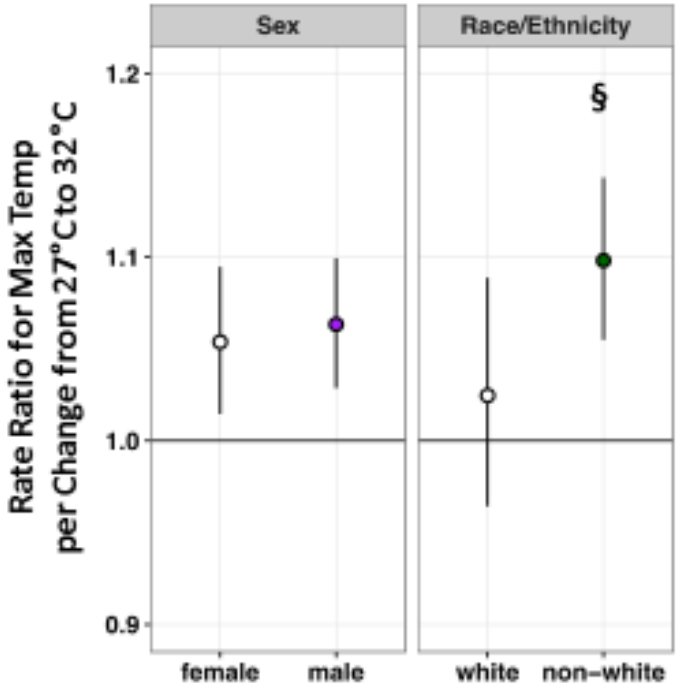
Extreme Heat and Health in Atlanta

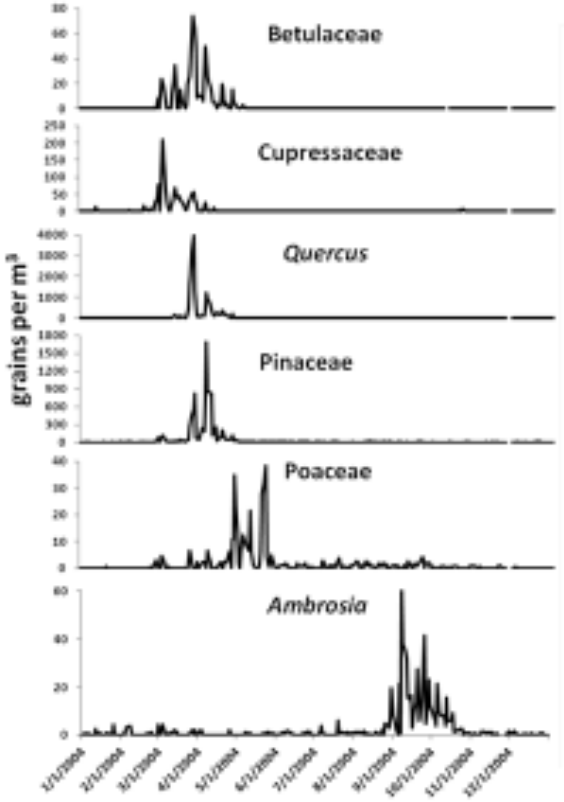
- Study to estimate associations of warm season temperatures, heat waves, and ED visits for range of outcomes in Atlanta
- E.g., strong associations of temperatures and **ED visits for asthma among children,** with health effects several days after exposure
- No observed difference in risk among girls vs. boys, but possible susceptibilities among non-white compared to white children

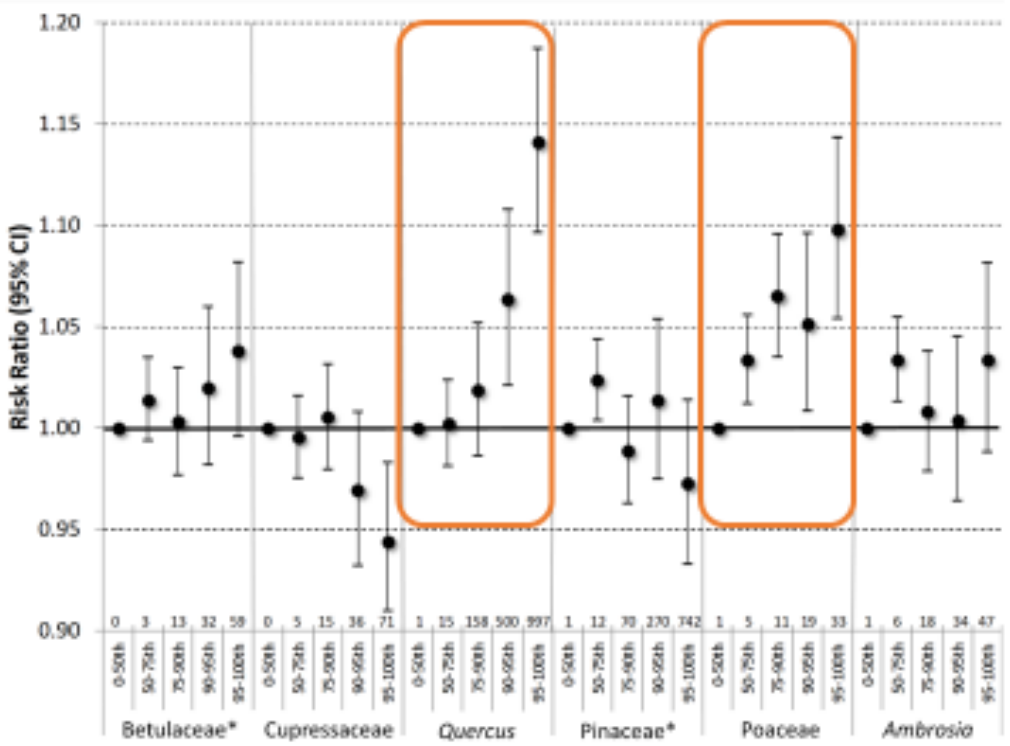


Winquist et al., 2016; Heidari et al., 2016; O'Lenick et al., 2017; Chen et al., accepted

Courtesy of Stefanie Sarnat, Emory Rollins School of Public Health

Pollen & Asthma ED Visits in Atlanta





Darrow et al., 2012

	Adaptation / Resilience		Mitigation
Georgia	Understand impacts Heat Air Pollution Allergies	Implement responses	Strengthen case for action
Global	Understand impacts 	Implement responses	Strengthen case for action

Comparative Risk Assessment of the Burden of Disease from Climate Change

Diarmid Campbell-Lendrum[1,2] and Rosalie Woodruff[3]

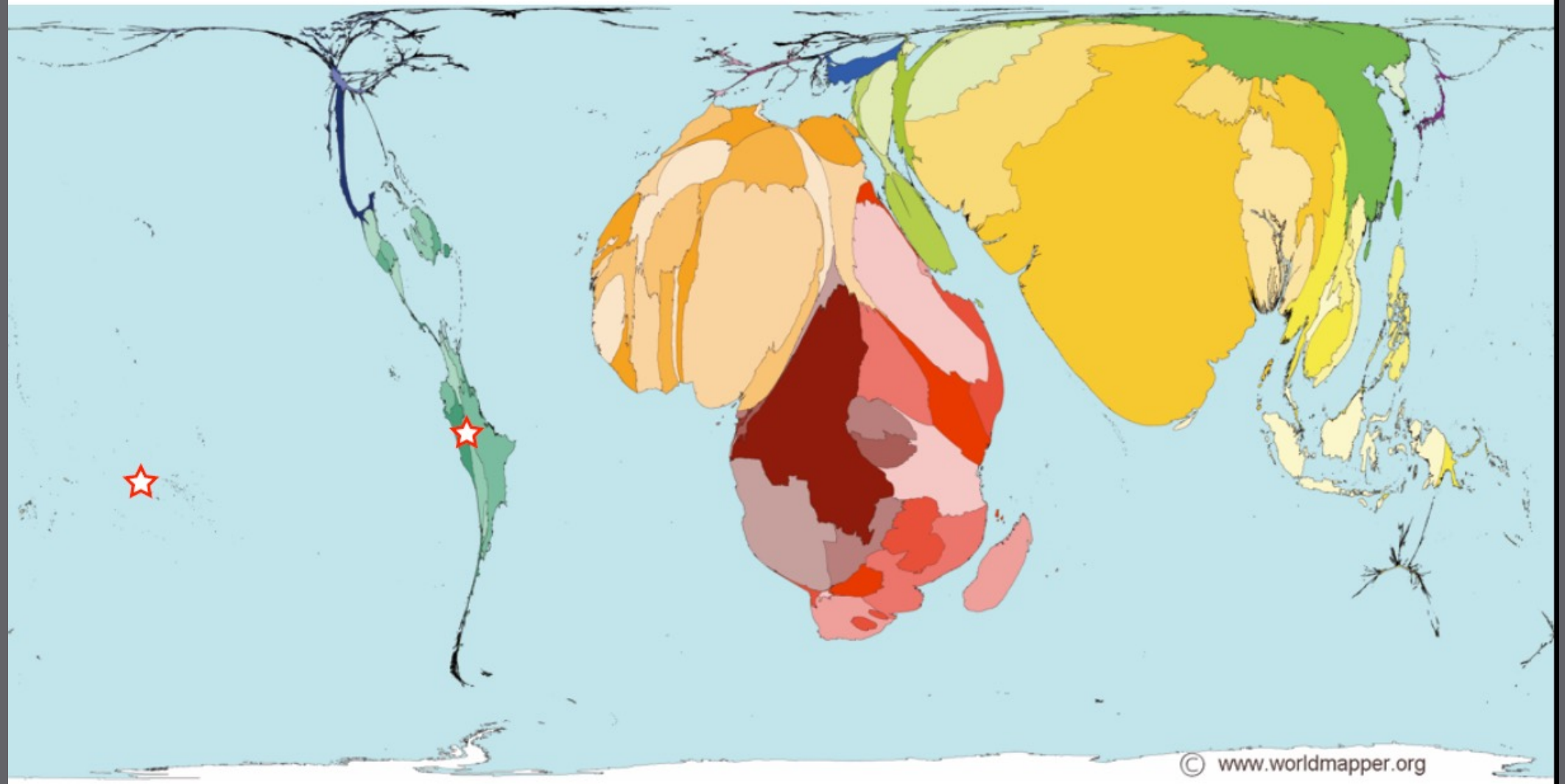
Environmental Health Perspectives • VOLUME 114 | NUMBER 12 | December 2006

[1]Department of Public Health and Environment, World Health Organization, Geneva, Switzerland; [2]London School of Hygiene and Tropical Medicine, London, United Kingdom; [3]National Centre for Epidemiology and Population Health, Australian National University, Canberra, Australia

Impacts on diarrheal disease. Dose–response relationships were derived from time-series studies of temperature variations and diarrhea incidence in developing countries (Checkley et al. 2000; Singh et al. 2001). Relative risks were calculated by multiplying the projected increase in temperature by the derived exposure–response relationship. In the global assessment the resulting relative risks were applied to WHO estimates of the overall current burden from diarrhea in developing regions, to estimate attributable diarrhea deaths and DALYs from climate change in 2000 and relative risk estimates for years to 2030 (adjusting for effects of economic development). In the Oceania assessment the relative risks from studies conducted in developing countries were applied to remote Aboriginal populations (which suffer rates of diarrheal disease similar to those of developing countries) to estimate increased diarrhea cases out to 2050.

courtesy of Karen Levy, Emory Rollins School of Public Health

Deaths from Diarrhea



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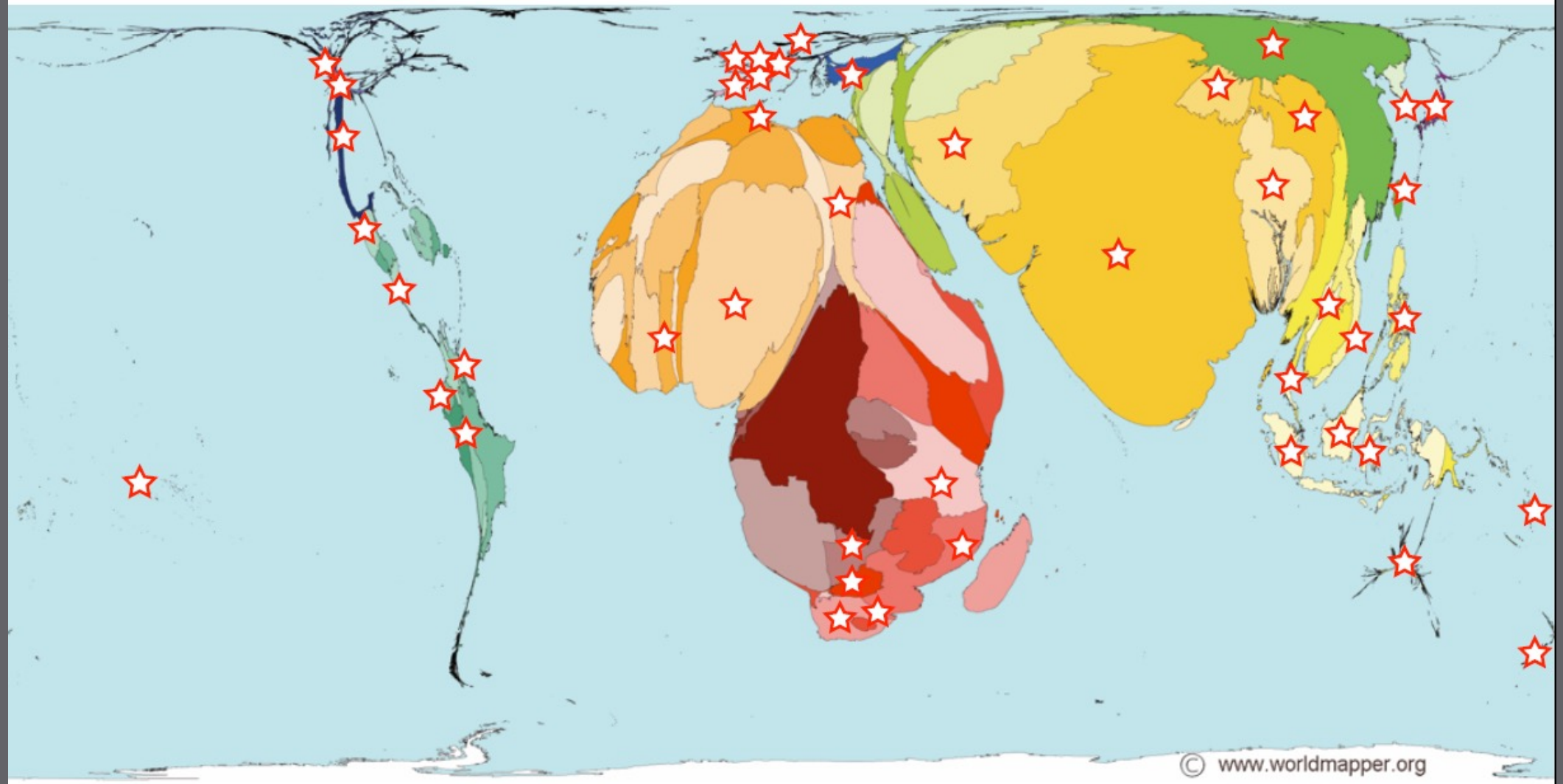

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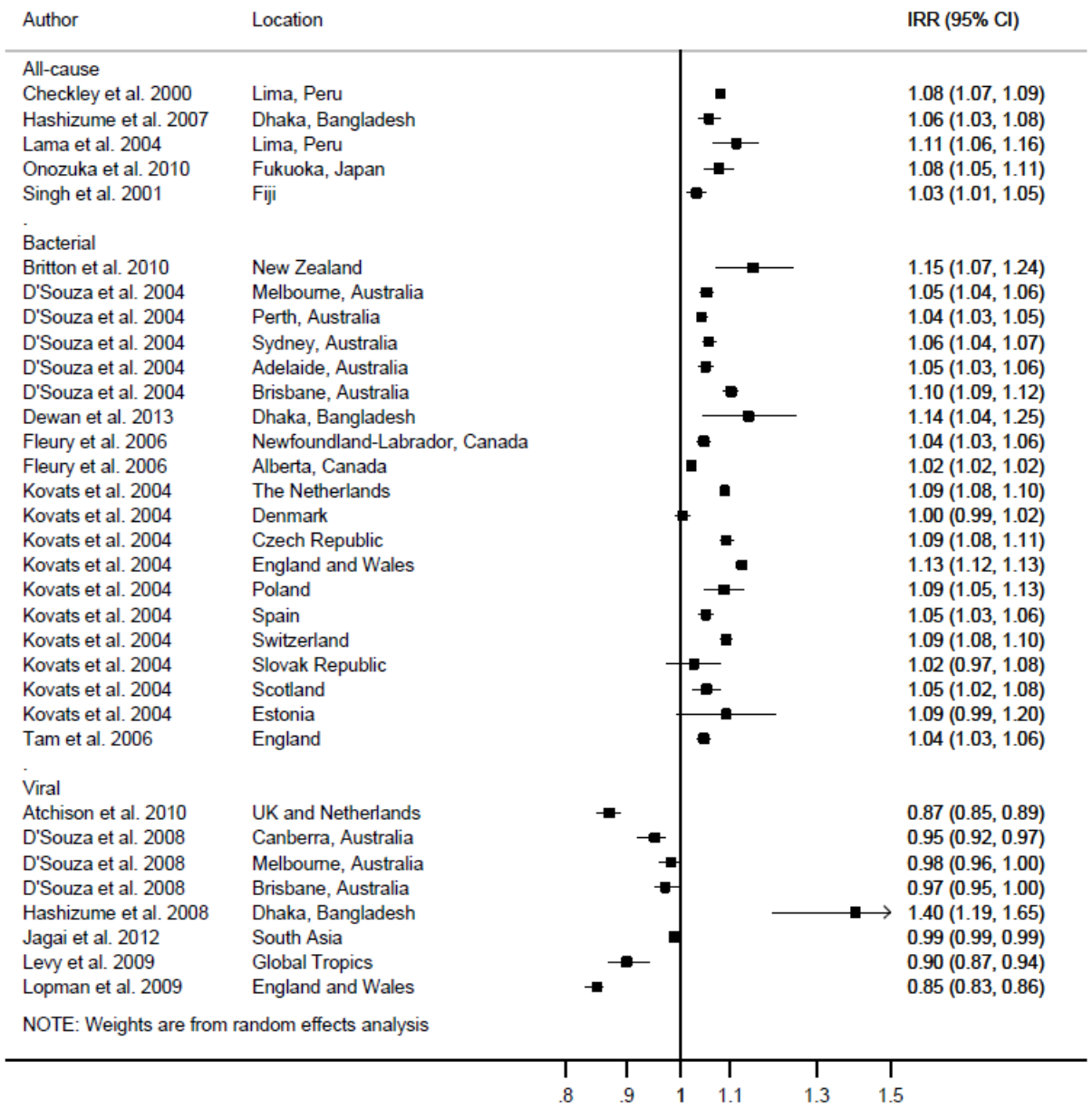
Mean temperature: 33 analyses from 17 manuscripts



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Carlton et al. 2016. International Journal of Epidemiology.

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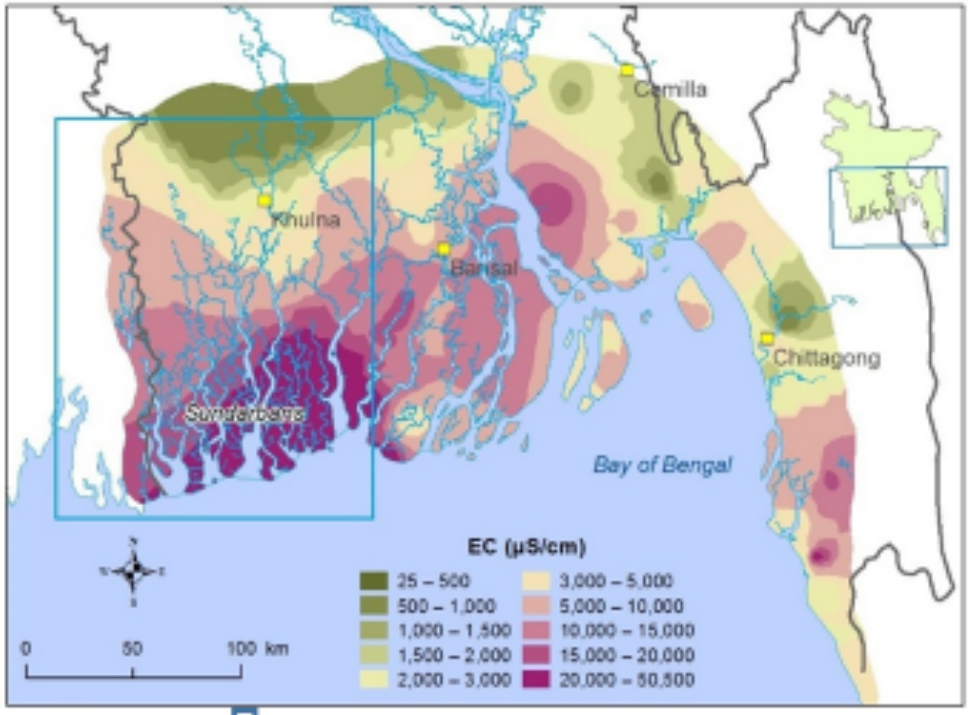
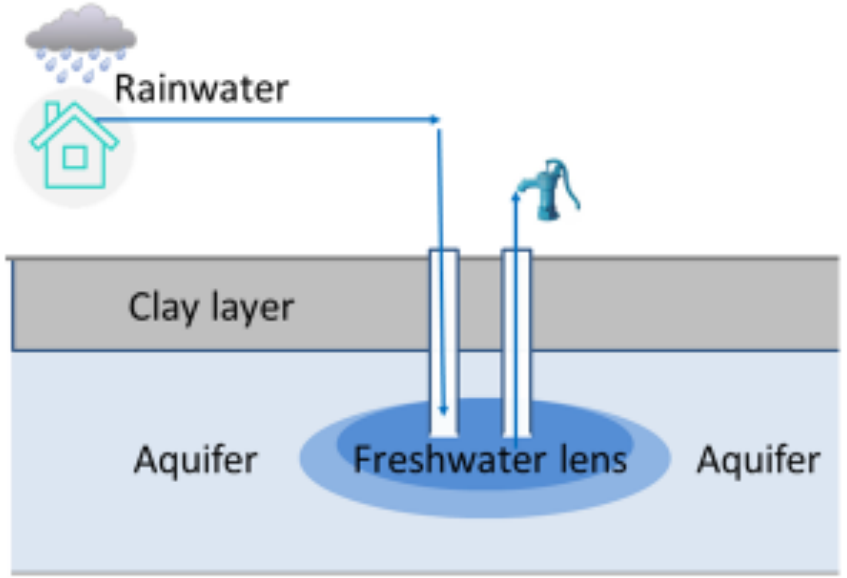
What are the health impacts of water salinity lowering intervention in coastal Bangladesh?



Managed aquifer recharge (MAR)



Health problems:

- High sodium intake (5-16 gm/day)
- High blood pressure
  - ✓ Pregnant moms
  - ✓ Adults

Health benefits and risk assessments

courtesy of Naser Titu, Emory Rollins School of Public Health

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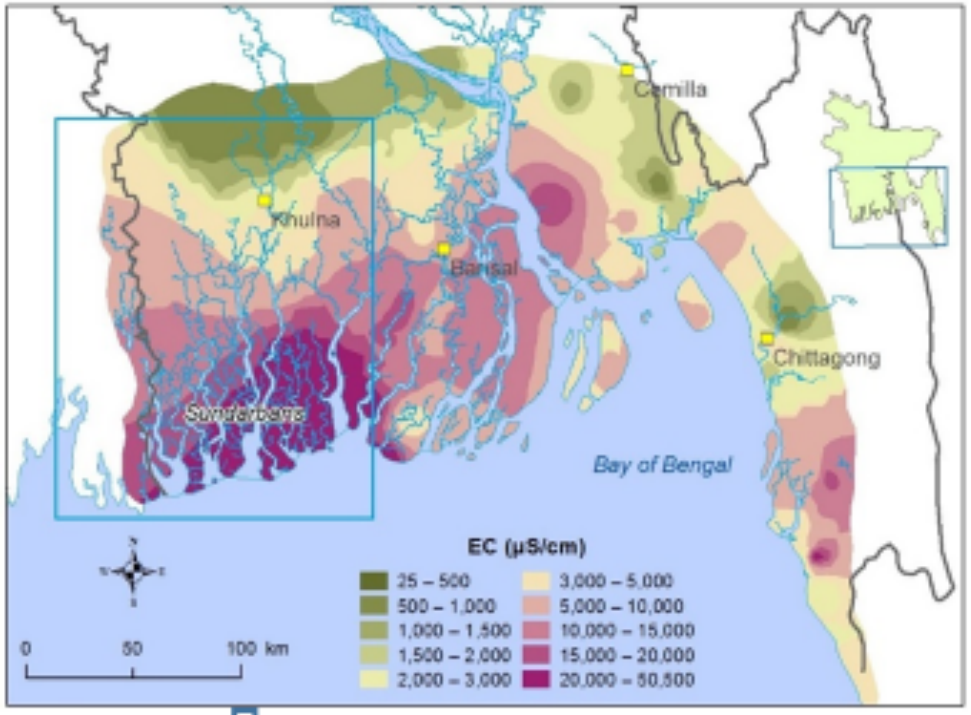

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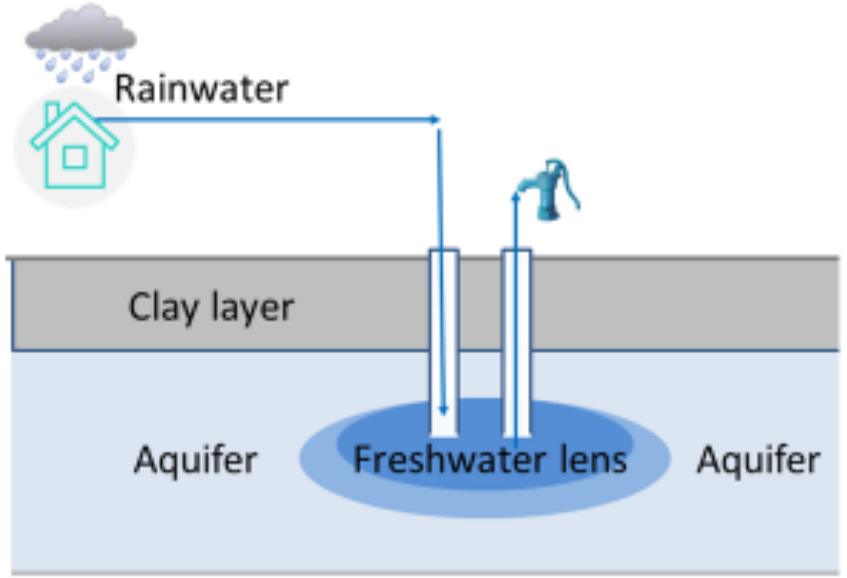

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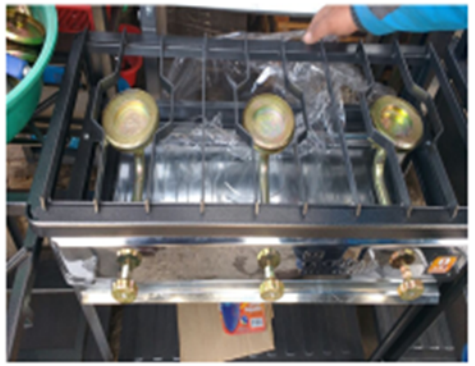
HAPIN

Household Air Pollution Intervention Network

Household Air Pollution and Health:
A Multi-Country Intervention Trial

Emory Rollins School of Public Health
Johns Hopkins University
Colorado State University
London School of Hygiene & Tropical Medicine
Universidad del Valle de Guatemala
PRISMA
Sri Ramachandra University, Chennai
University of Rwanda
Berkeley Air Monitoring Group
The University of Georgia
Universidad Peruana Cayetano Heredia
The Global LPG Partnership
Washington University in St. Louis
UCSF University of California San Francisco
Harvard T.H. Chan School of Public Health, Department of Global Health and Population



Data across life cycle: from fetal growth to adult outcomes

ADULT OUTCOMES:
- Pollutant exposures and blood pressure/SGRQ at baseline and 1-3, 3-5, 12, 18-24, and 30 months post-randomization
- BART and CIMT at baseline and 18-24 months post-randomization

GROWTH AND HEALTH:
- Quarterly anthropometry
- IYCF and milestones
- Weekly surveillance for pneumonia symptoms and lung ultrasound for imaging
- Pollutant exposures at 6 mo and 12-18 mo

PREGNANCY AND FETAL GROWTH:
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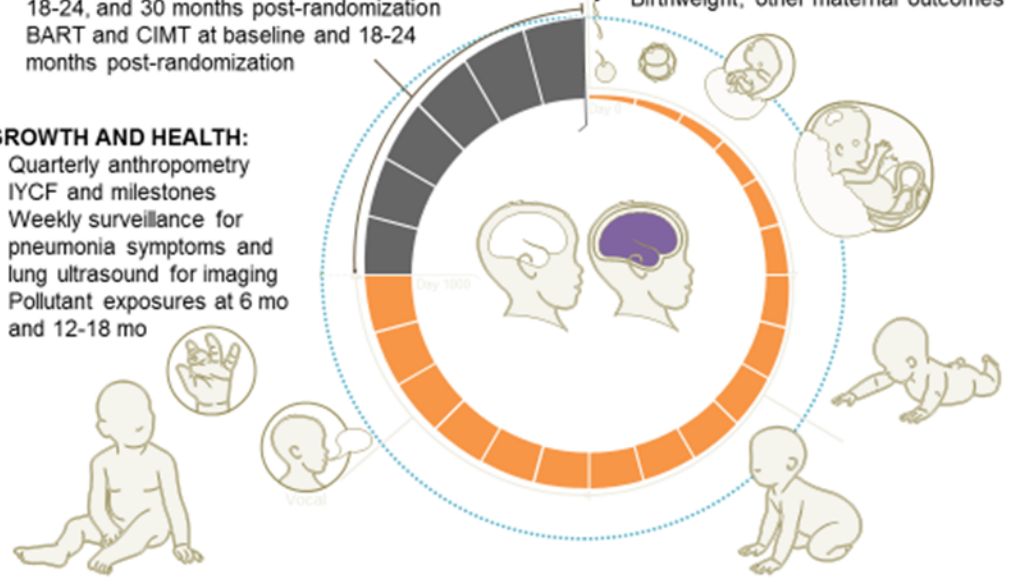
- Birthweight, other maternal outcomes



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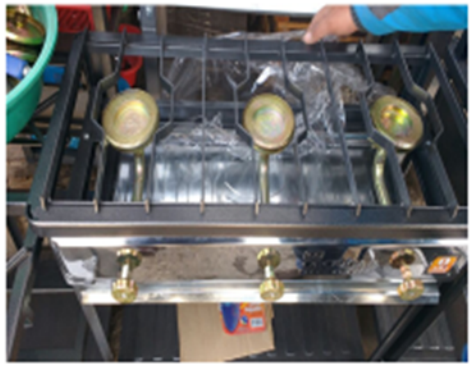

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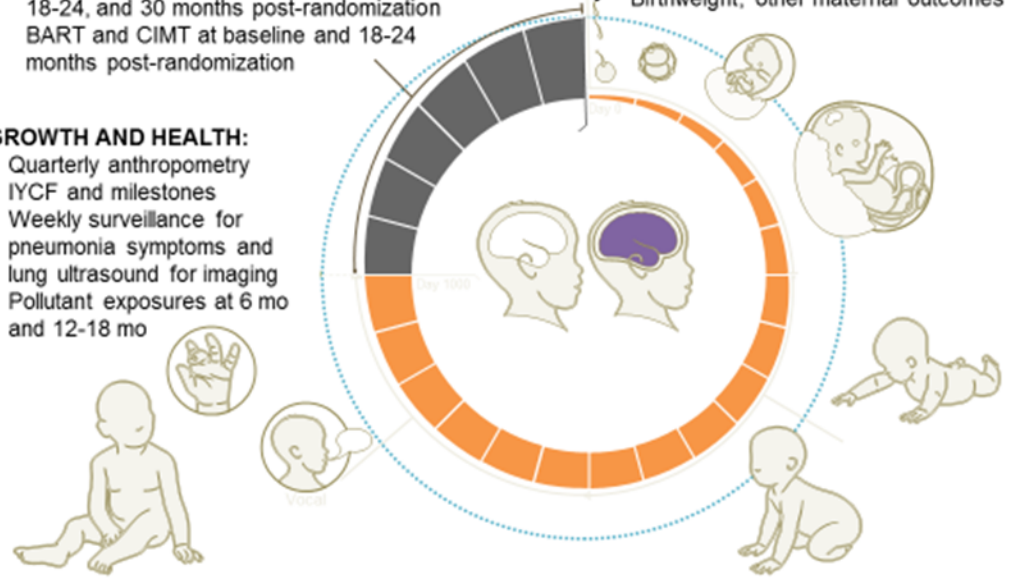

courtesy of Tom Clasen, Emory Rollins School of Public Health

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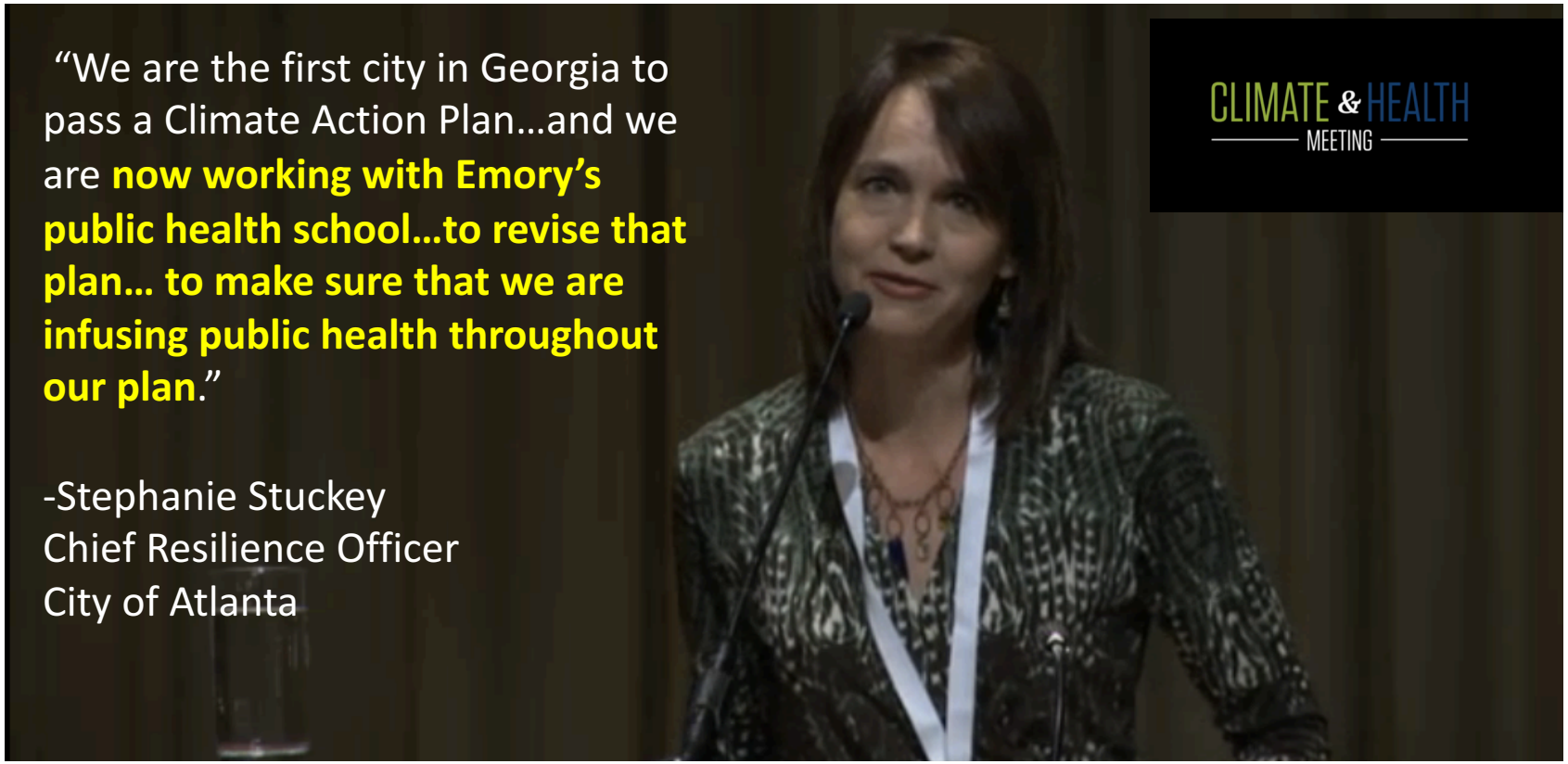
Emory Climate Analysis and Solutions Team

an initiative of EMORY UNIVERSITY | Climate@Emory

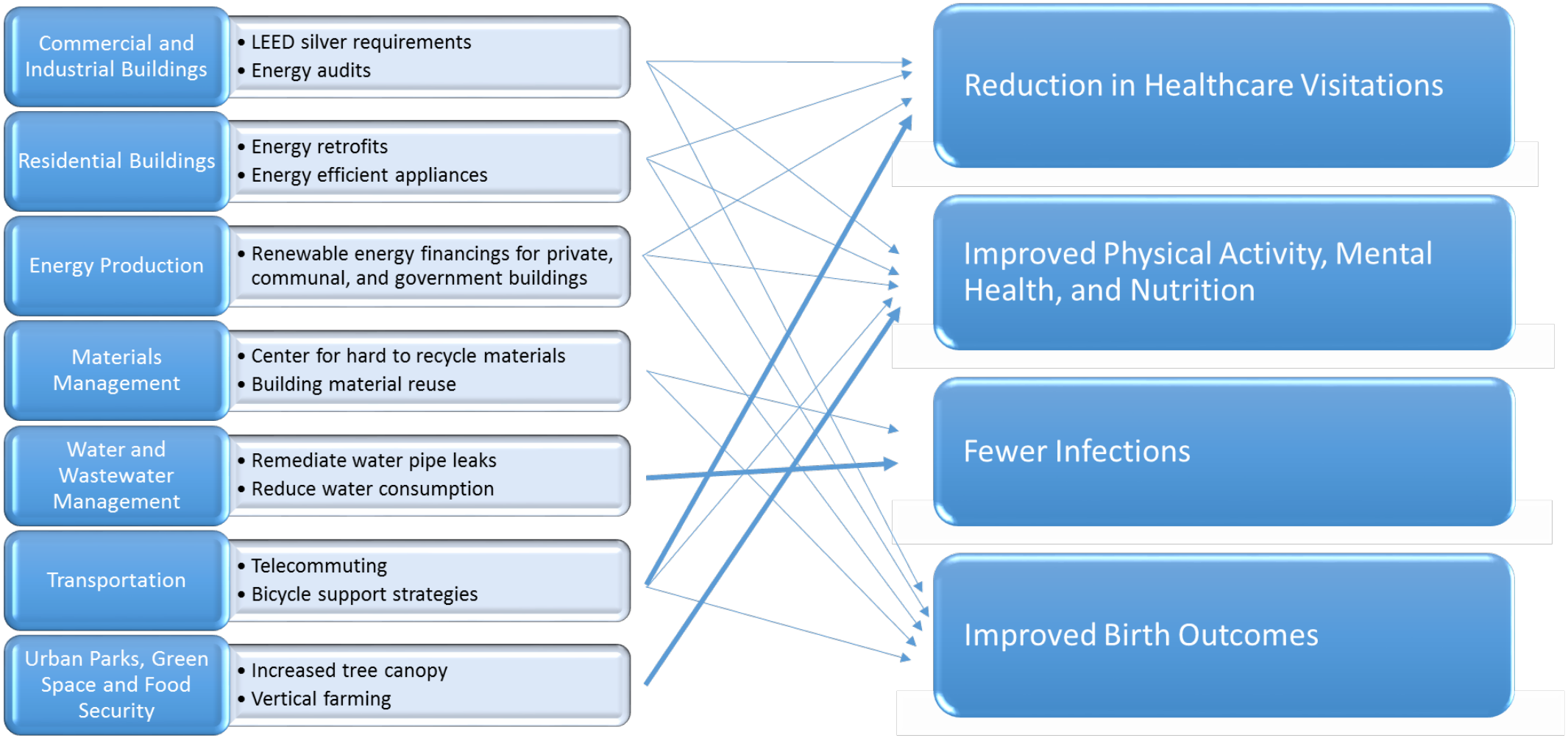
- Launched Sept 2016
- 73 students (55 undergrad, 18 grad)
- 20 faculty/staff
- 10 projects



"We are the first city in Georgia to pass a Climate Action Plan…and we are **now working with Emory's public health school…to revise that plan… to make sure that we are infusing public health throughout our plan**."

-Stephanie Stuckey
Chief Resilience Officer
City of Atlanta

Analysis by Ian Buller, Sam Peters, et al., Rollins School of Public Health



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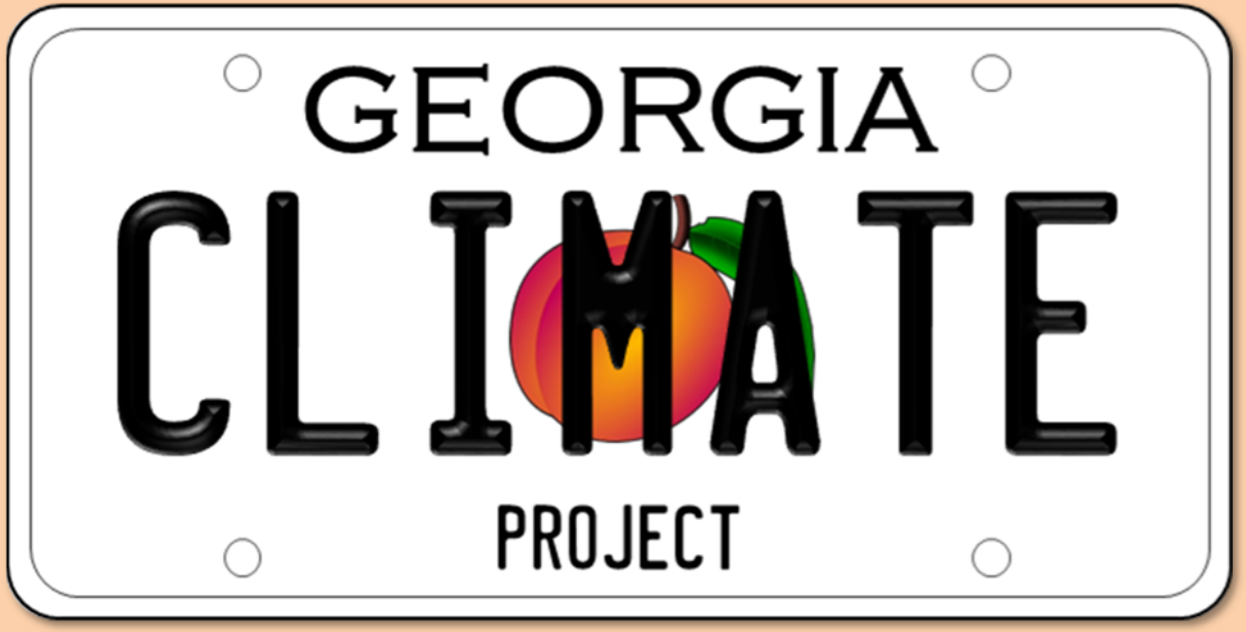

www.GeorgiaClimateProject.org

A multi-year effort by a state-wide consortium to support effective, science-based climate action in Georgia.

Our vision

In 5 years, Georgia will be recognized regionally and nationally as **a leader on climate change.**

We will have a track record of **constructive discussion** among **diverse groups,**

leading to **practical, science-based action**

to **maximize the economic opportunities** and **minimize the economic risks** associated with a changing climate.

Science

Stronger Conversations

Solutions

How can the public health community address climate change?

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