

Heat, Health, and Adaptation

Resilient Chicago

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Big concepts

- Multiple, serious, health problems linked with heat
- Designating cooling centers is just the beginning of resilience
- Data to for informing resilience strategies are limited

Deaths in heat waves

- July, 1995: 700 people died
- Vulnerability:
 - Elderly
 - Living alone
 - Poverty
 - No air conditioning
 - Chronic medical conditions



A.P. ile photo in the Chicago Tribune Aug. 25, 1995
Homewood Memorial Cemetery, Homewood IL

Heat waves: a small part of the problem

- During heat waves
 - Deaths due to over-heating (heat stroke)
 - Excess natural cause mortality
- Outside of heat waves
 - 80 vs. 75 degrees, 85 vs. 80 degrees
 - More acute cardiac events with higher temperatures
 - Higher temperatures means higher ozone levels: more asthma attacks



Climate Change Adaptation: Increasing Resilience



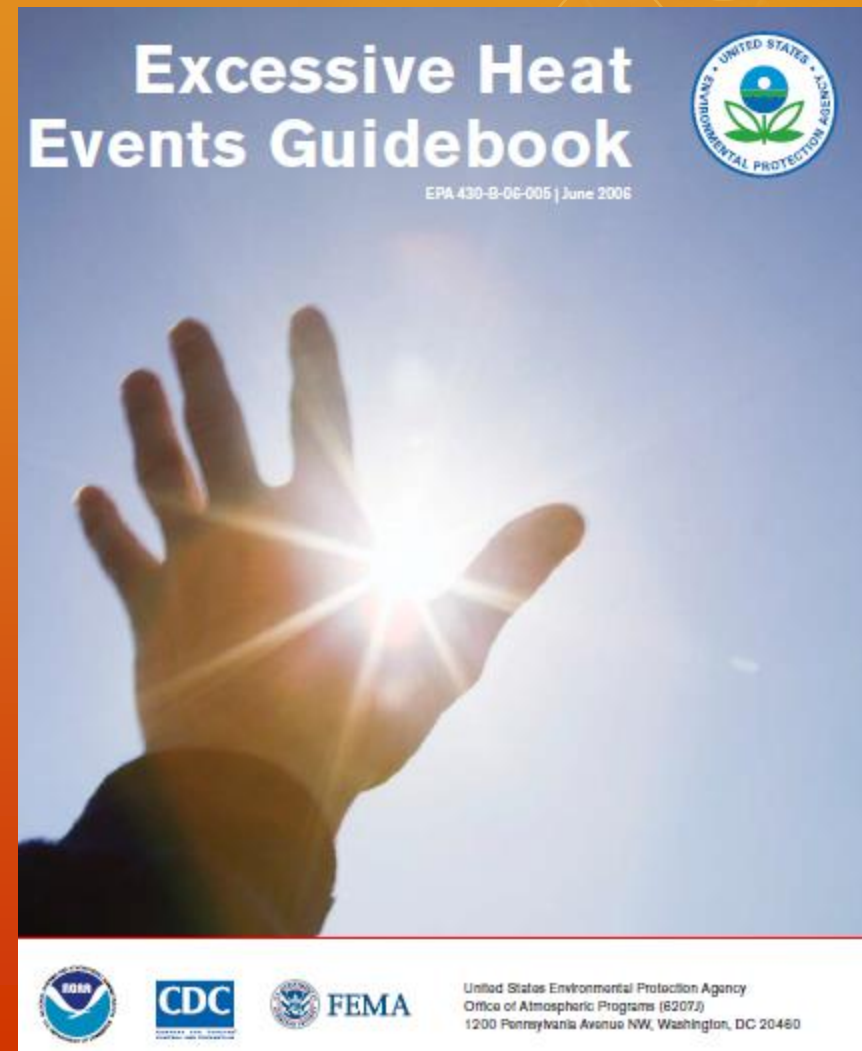
I-10, August 30, 2005
Associated Press



<http://www.twinspanbridge.com>

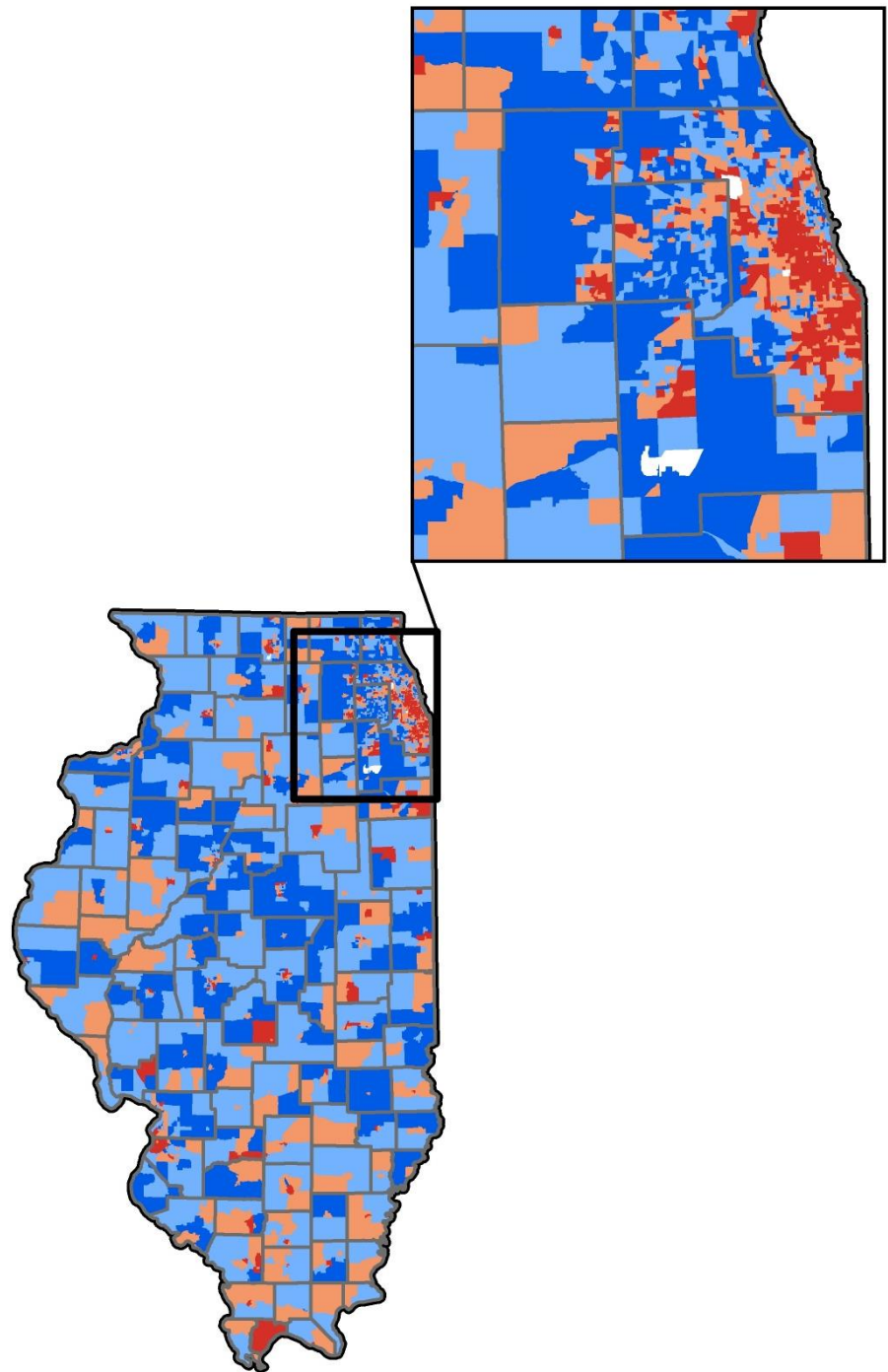
Plans for extreme heat events

- Leadership
- Triggers
- Communications
 - “Open the cooling centers”
 - Notify at-risk groups
 - Reaching the hard-to-reach
- Facilities, back-up power
- Suspend utility shut-off
- Public event rescheduling

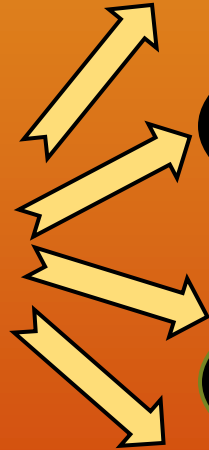
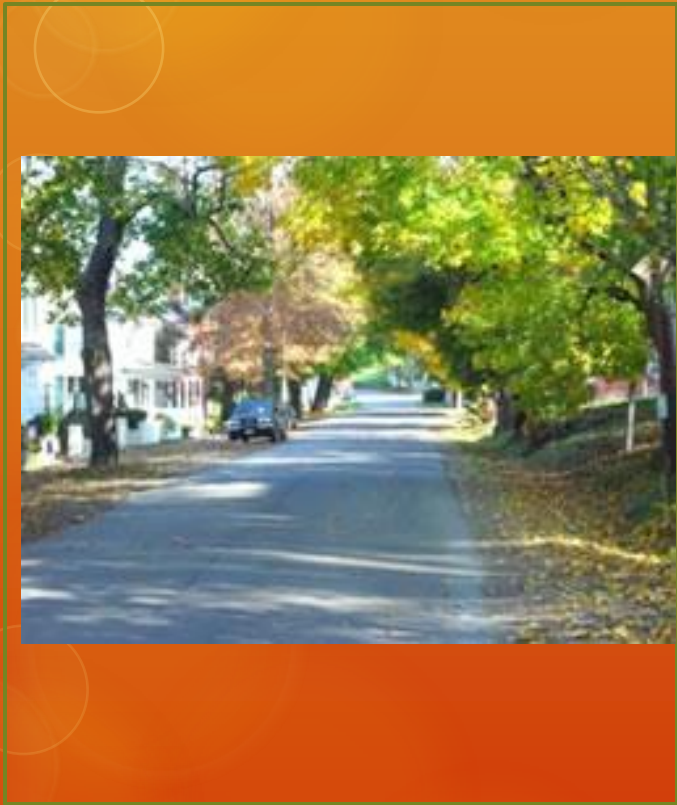


CDC's 'Social Vulnerability Index'

- Socioeconomic
- Household composition
- Minority status/ language
- Housing/ transportation



Mitigation, adaptation, and public health co-benefits



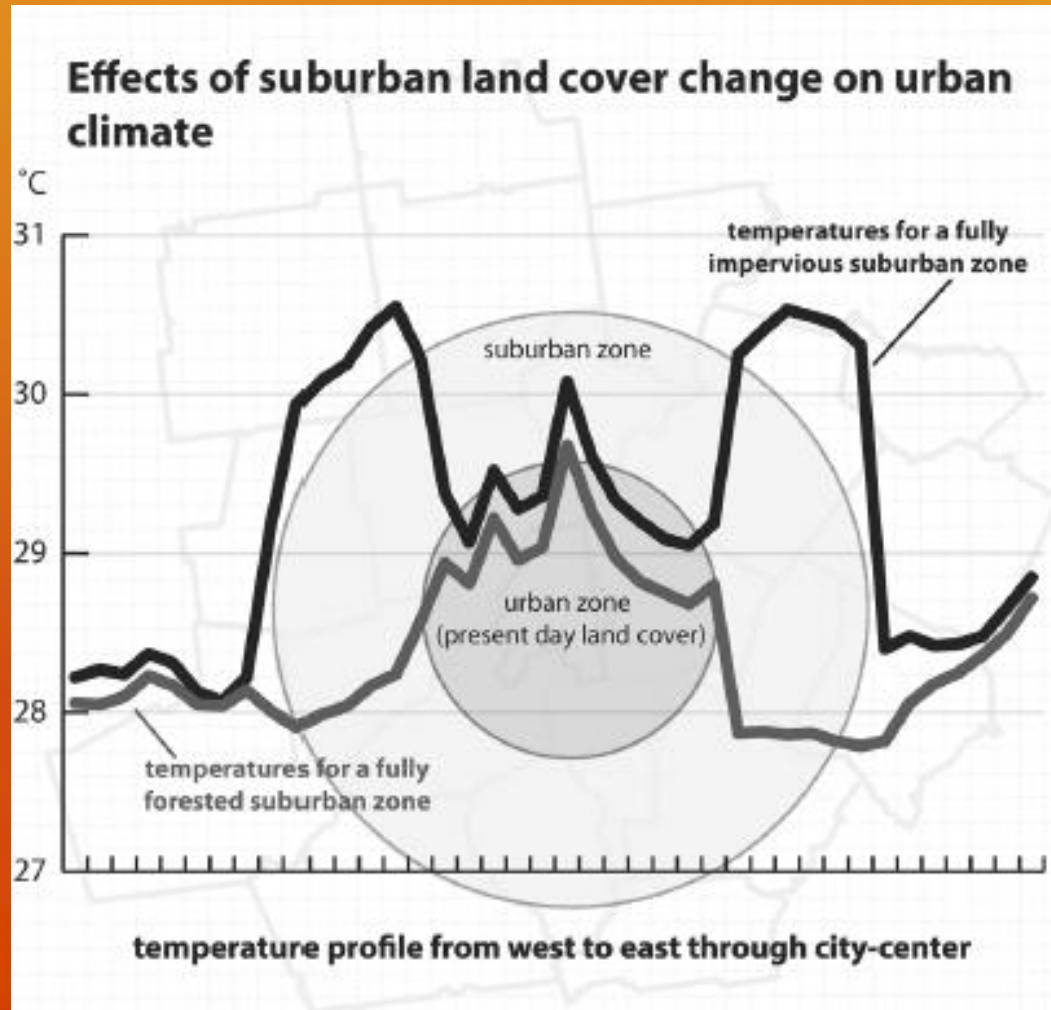
↓ need for
A/C

↓ urban heat
island effect

↓ Storm
water runoff

↑ greenspace
phys. activity

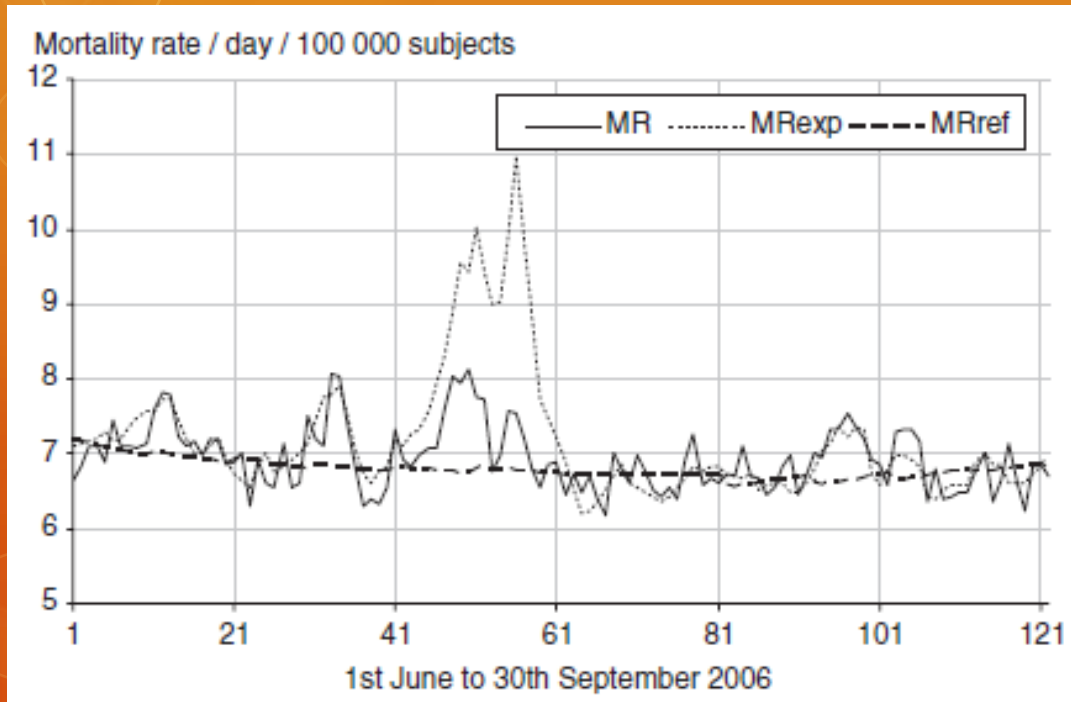
Urban benefits from regional trees planting (from B.Stone, et al 2013)



Impacts of adaptation in Chicago?

- 1995 heat wave (described by Semenza et al, others)
- 1999 heat wave (described by Naughton et al)
- Median age: 76 (1995) vs. 63 (1999)
- Perhaps a higher percent with chronic psychiatric and cardiac conditions in 1999
- 1999: no statistically significant benefit of cooling center visits, but study not large enough to evaluate
- Overall, similar risk factors: no air conditioning, elderly, living alone, chronic health problems, home-bound
- Implication: Outreach to elderly since 1995 improved but need more outreach to chronically mentally ill?

Indications that adaptation works: France, 2006 vs. 2003 (Fouillette, 2008)



After 2003 event

- A/C for hospitals, nursing home
- Public education
- Early warning and alert systems

2006 event

- 2,065 death occurred in 2006 heat wave
- 6,452 deaths 'expected' based on weather

Questions?

