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Physicians for Social Responsibility

1985 NOBEL PEACE PRIZE

Extreme Weather Impacts on Public Health

Catherine Thomasson, MD April 10, 2013

Health = Good Food

Health = Shelter

Health Need for Clean Air

Clean Water

Need for infrastructure

Hanta Virus

Lyme Disease

Increased temperatures

Increased extreme weather events

Change in water cycle

Flooding + sea level rise

Air pollution and Health

Vector-borne
infectious diseases

Diagnosis?

Carbon Pollution= Homo Sapiens disease

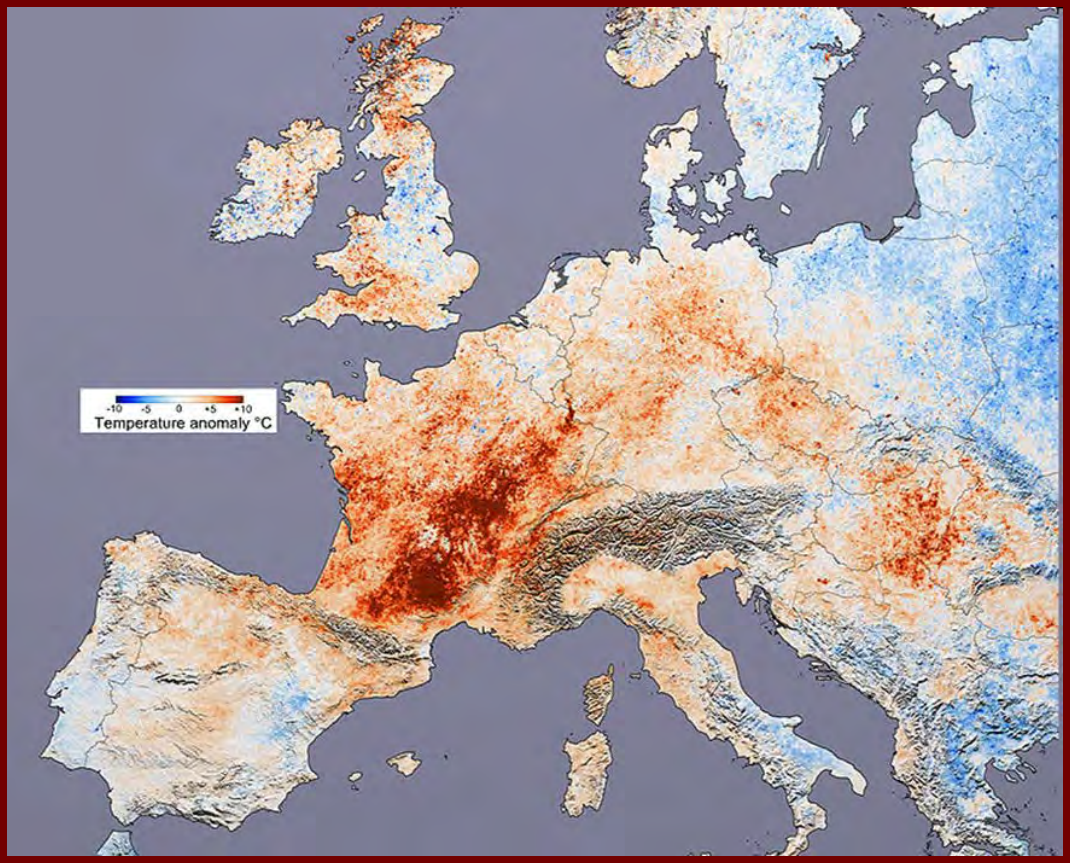
Key Points

- Threats to health from extreme weather
- Impacts are worse on vulnerable populations
- Adaptation is not only is possible it is essential
- Adaptation will lead to community understanding needs for mitigation.

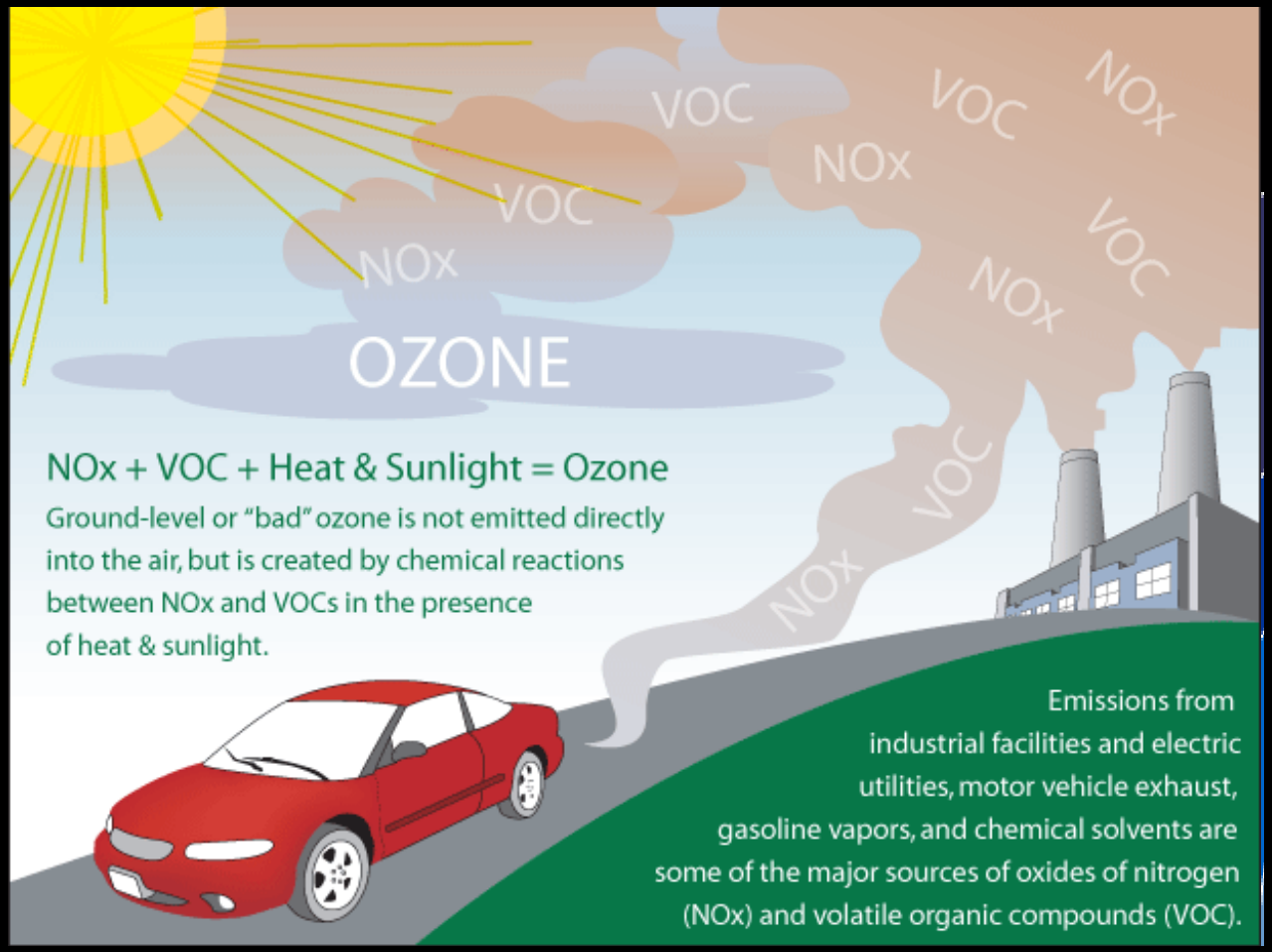
HEAT WAVE:
Nationwide July 2011

2003 European Heat Wave

- Final estimate: 70,000 excess deaths
- Loss or no air conditioning
- Impact elderly, chronically ill and little children



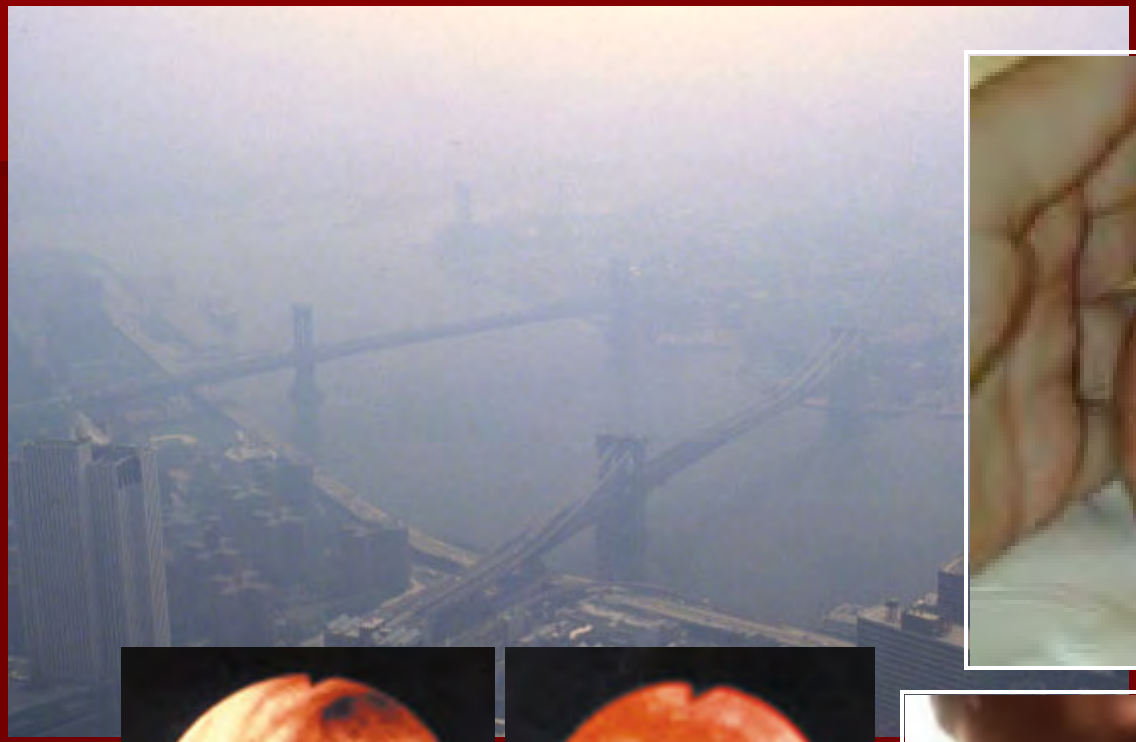
NASA



VOC's + NOx
Sun + HEAT

=OZONE

Ground Level Ozone



Healthy Airway

Inflamed Airway

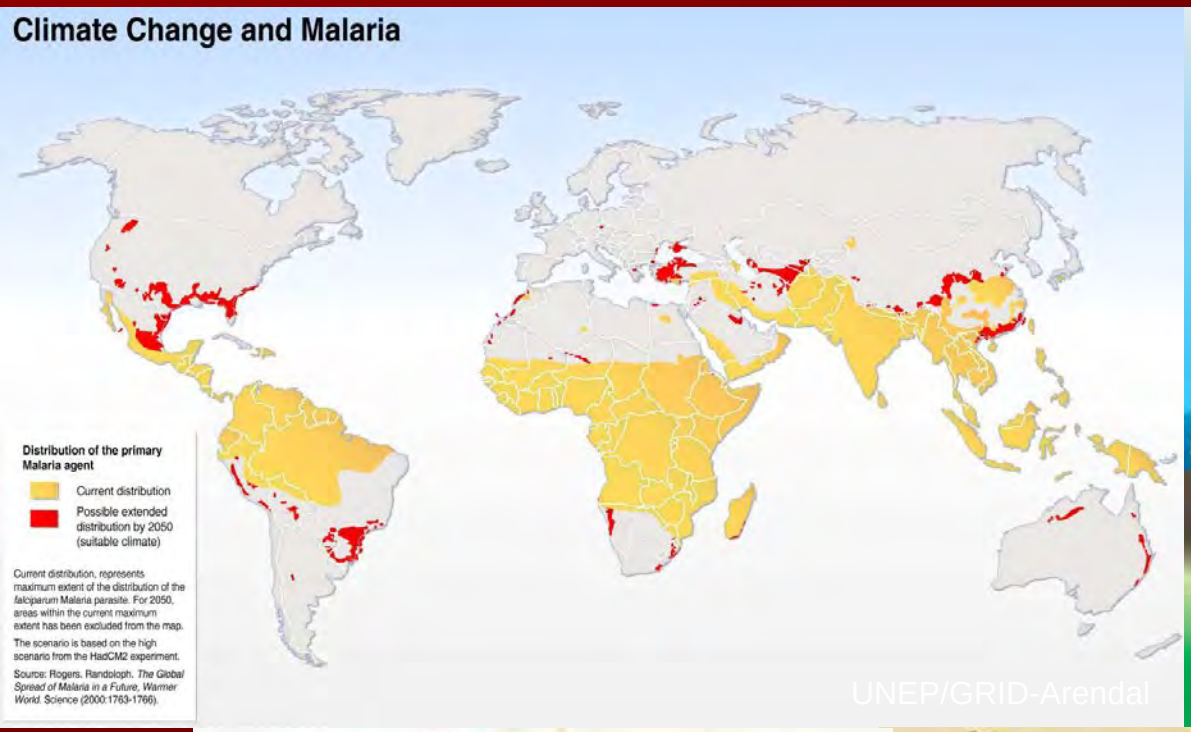
Global Warming Causes Asthma

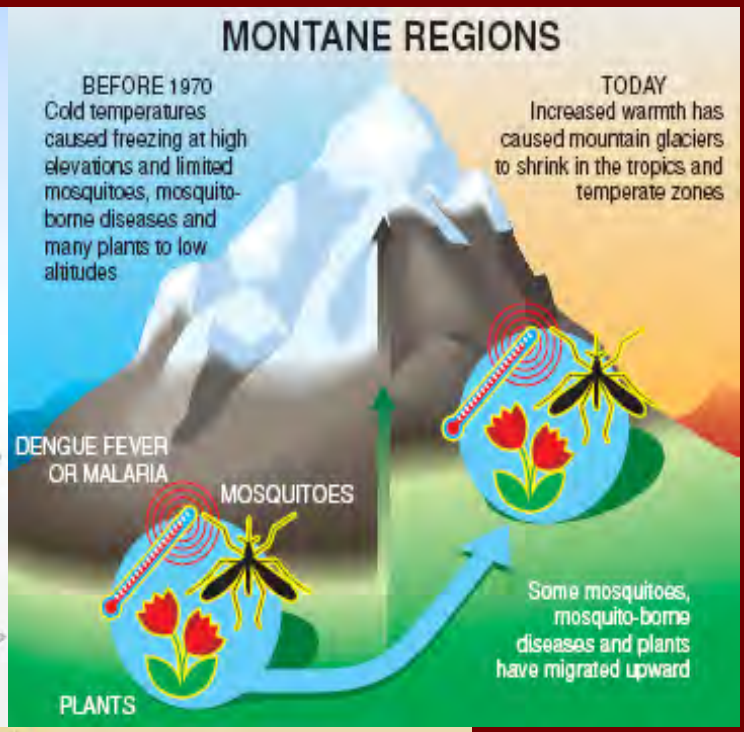
US EPA

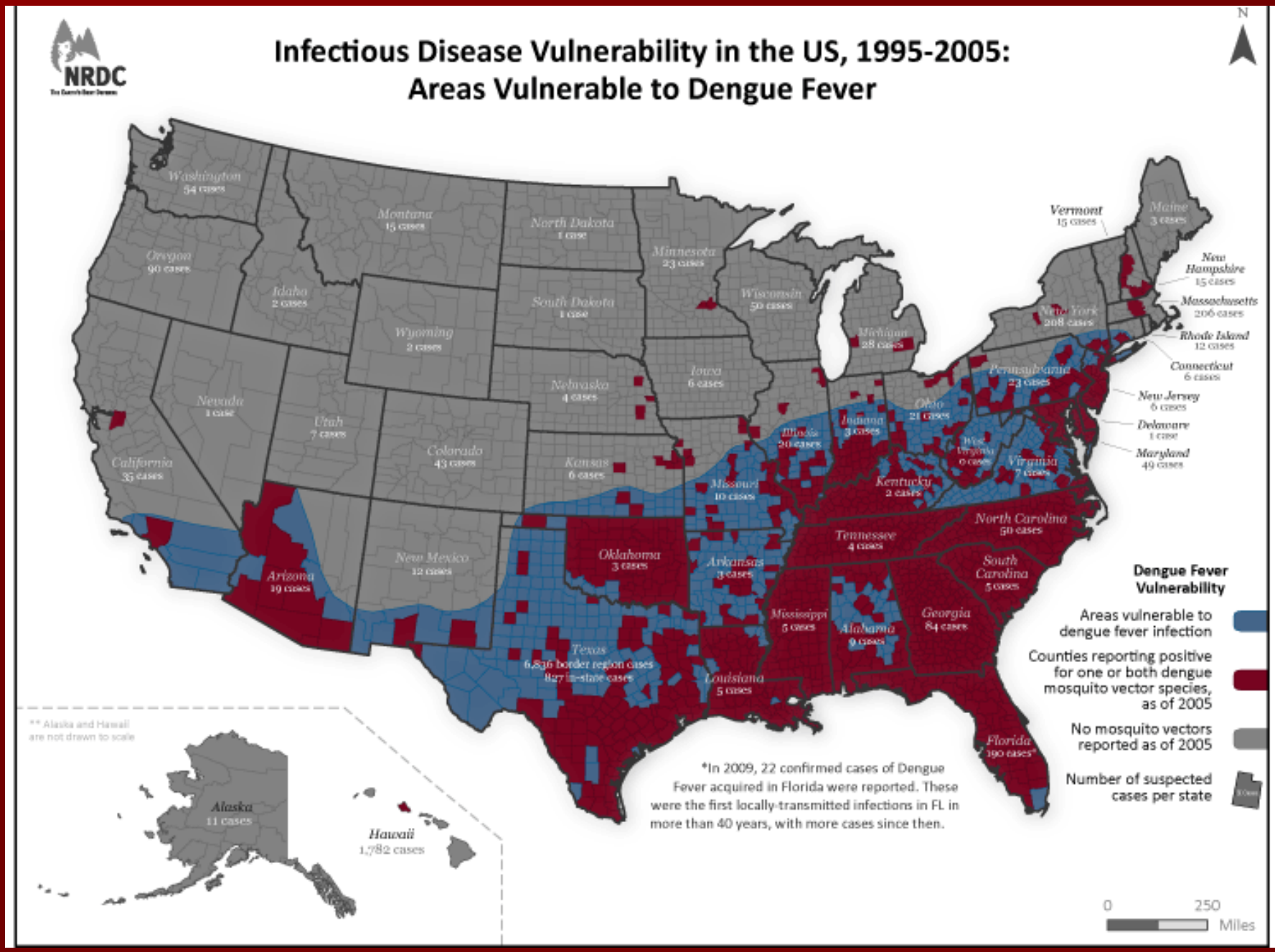
In communities with high ozone concentrations: relative risk of developing asthma in children playing 3 or more sports = 3.3 (95% CI 1.9-5.8) compared with children playing no sports

Lancet 2002; 359:386-91

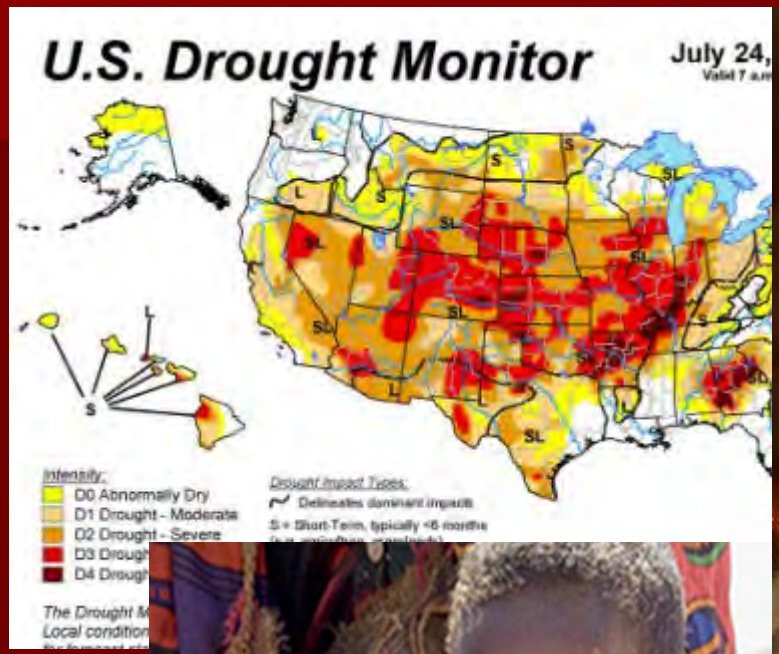
Vector Borne Diseases: Malaria



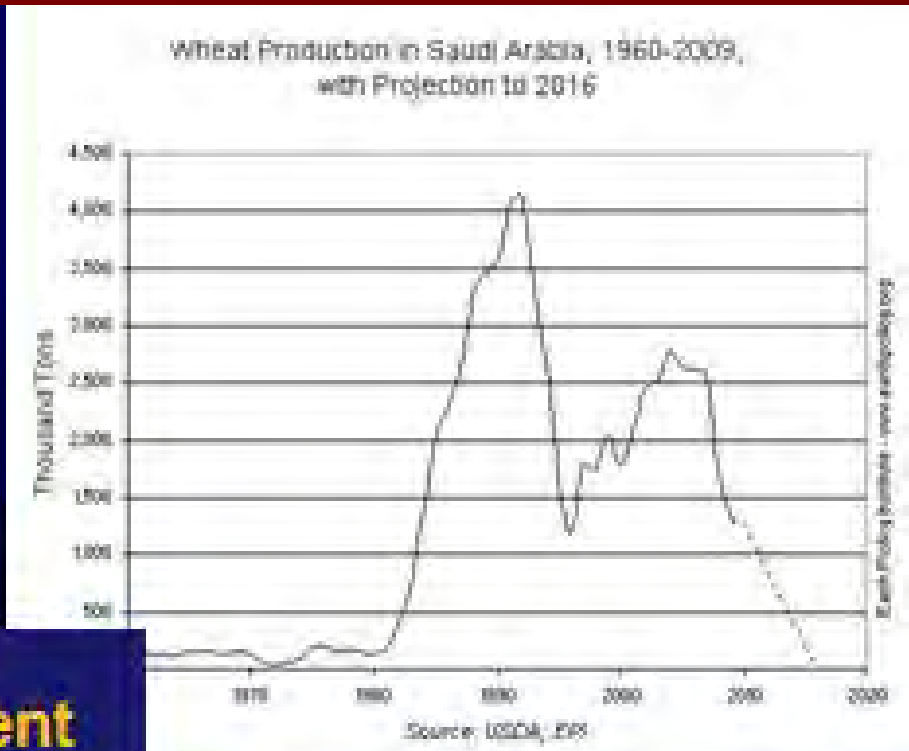



NRDC
Infectious Disease Vulnerability in the US, 1995-2005:
Areas Vulnerable to Dengue Fever
N
Washington
54 cases
Oregon
90 cases
California
35 cases
Idaho
2 cases
Nevada
1 case
Montana
15 cases
Wyoming
2 cases
Utah
7 cases
Arizona
19 cases
Colorado
43 cases
New Mexico
12 cases
North Dakota
1 case
South Dakota
1 case
Nebraska
4 cases
Kansas
6 cases
Oklahoma
3 cases
Texas
6,836 border region cases
827 in-state cases
Minnesota
23 cases
Iowa
6 cases
Missouri
10 cases
Arkansas
3 cases
Louisiana
5 cases
Wisconsin
50 cases
Illinois
20 cases
Michigan
28 cases
Indiana
3 cases
Ohio
21 cases
Kentucky
2 cases
Tennessee
4 cases
Mississippi
5 cases
Alabama
9 cases
Georgia
84 cases
Florida
190 cases*
South Carolina
5 cases
North Carolina
50 cases
Virginia
7 cases
West Virginia
0 cases
Pennsylvania
23 cases
New York
208 cases
Vermont
15 cases
Maine
3 cases
New Hampshire
15 cases
Massachusetts
206 cases
Rhode Island
12 cases
Connecticut
6 cases
New Jersey
6 cases
Delaware
1 case
Maryland
49 cases
Dengue Fever Vulnerability
Areas vulnerable to dengue fever infection
Counties reporting positive for one or both dengue mosquito vector species, as of 2005
No mosquito vectors reported as of 2005
Number of suspected cases per state
*In 2009, 22 confirmed cases of Dengue Fever acquired in Florida were reported. These were the first locally-transmitted infections in FL in more than 40 years, with more cases since then.
** Alaska and Hawaii are not drawn to scale
Alaska
11 cases
Hawaii
1,782 cases
0
250
Miles

Hydrologic Cycle: Drought



Drought, Famine, Water Refugees



In Saudi Arabia 28 desalination plants provide 50 – 70% of current drinking water supply—using 1.5 million barrels of oil per day

Nearly 1/3 of the world's land surface may be at risk of extreme drought by 2100.

Burke et.al. Journal of Hydrometeorology, Sept. 2006

Hurricane Katrina

- 1,100,000 people displaced
- 1,833 dead

- Illness/death due to loss of electricity
- 270,000 homes lost
- $200 billion in taxpayer $$

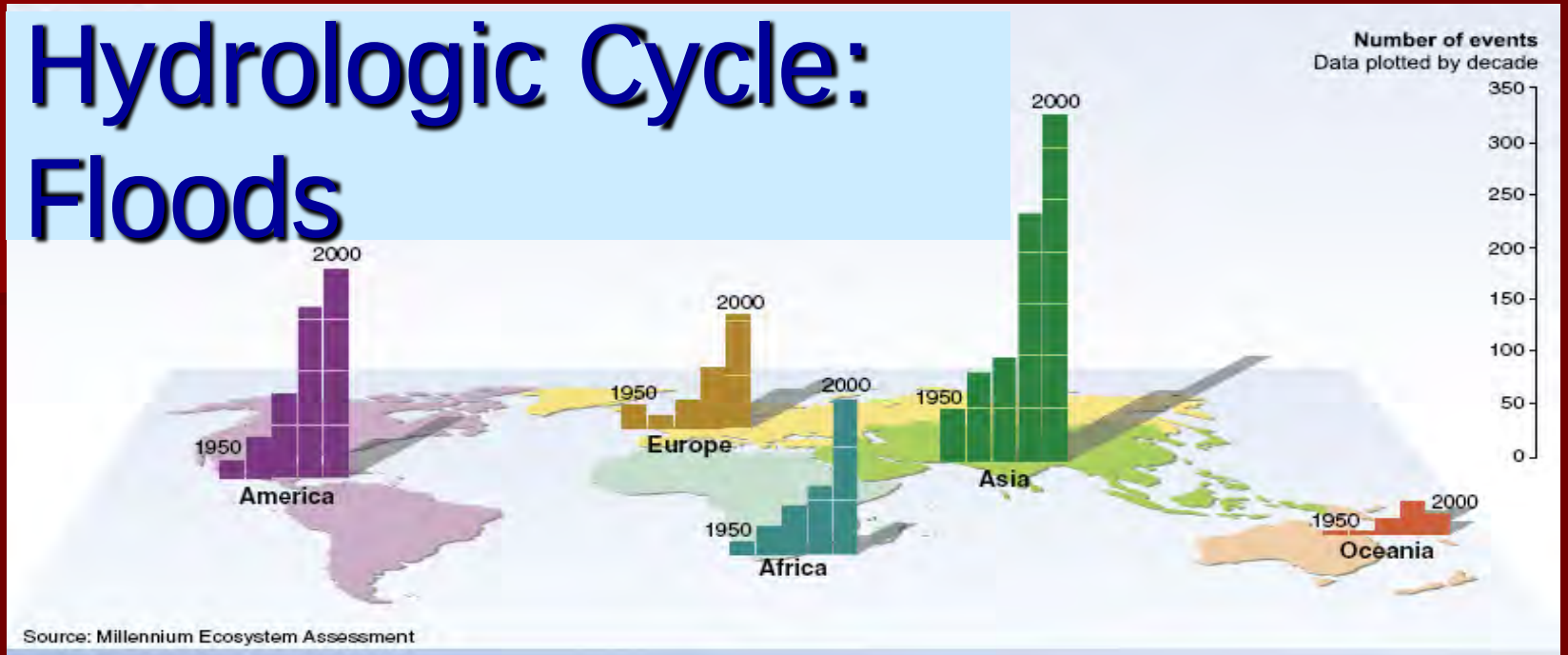
Pre-Katrina (2005)

- 25% < poverty level
- 20% uninsured
- 7 hospitals: 4000 beds
- 2200 beds in New Orleans

Post-Katrina

- 2006- 2000 beds
- 479 in New Orleans
- 2007-1 hospital operating fully; 2 partial
- 2010-5 hospitals
- 2010-- 50% Medicaid/uninsured

Hydrologic Cycle: Floods

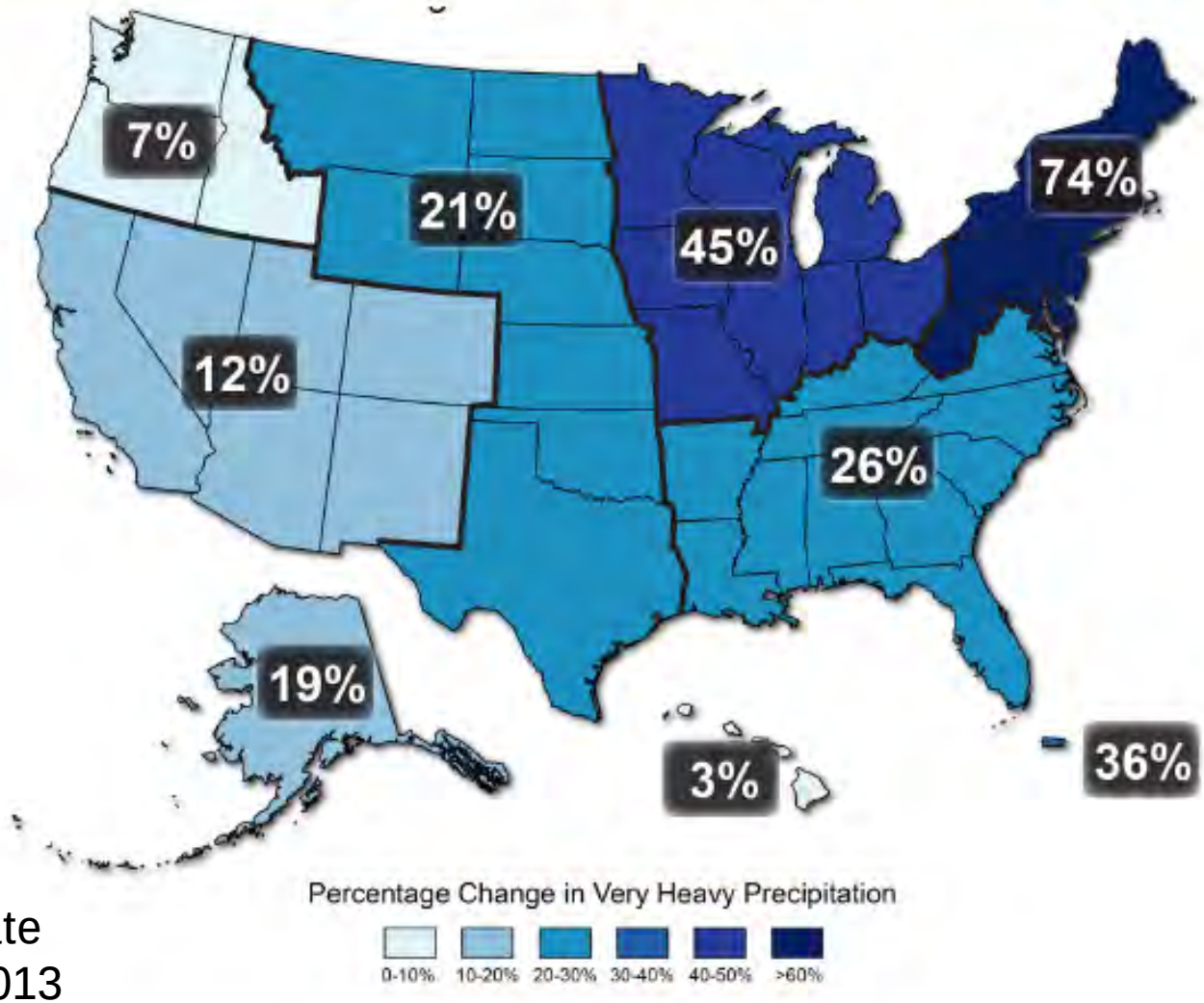


UN Millennium Ecosystem assessment

More Heat, Greater Evaporation

Observations show major increase in very heavy precipitation events over last 50 years

defined as the heaviest 1 percent of all daily events from 1958 to 2010



National Climate Assessment 2013

Combined Sewer Overflow

Duluth MN 2012

Flooding

- Cause injuries and deaths
- Mold
- Psychological effects
- Increase in rats

Sea Level rise + Storm Surge

- Bangladesh stands to lose ~15% of land mass with 1 meter sea level rise
- Compromising >10% of food production
- 13 of the world's 20 megacities are at sea level

Impact of storm surge

Miami storm surge

St. Mary's County

Coastal Impacts of Rising Sea Level

- Storm surge/wave height
- Loss of wetlands-30% by 2100
- Saltwater infiltration of clean drinking water
- Construction blocks

Impact of Global Warming on Agriculture

- Drought
- Decrease in pollination
- More water evaporation
- Crops under ocean

Global Warming Refugees

Major Effects of Global Warming

- Increasing temperature
- Increase in extreme weather
- Change in hydrologic cycles
- Ocean changes
- Increase in insect borne disease
- Pollution effects on health

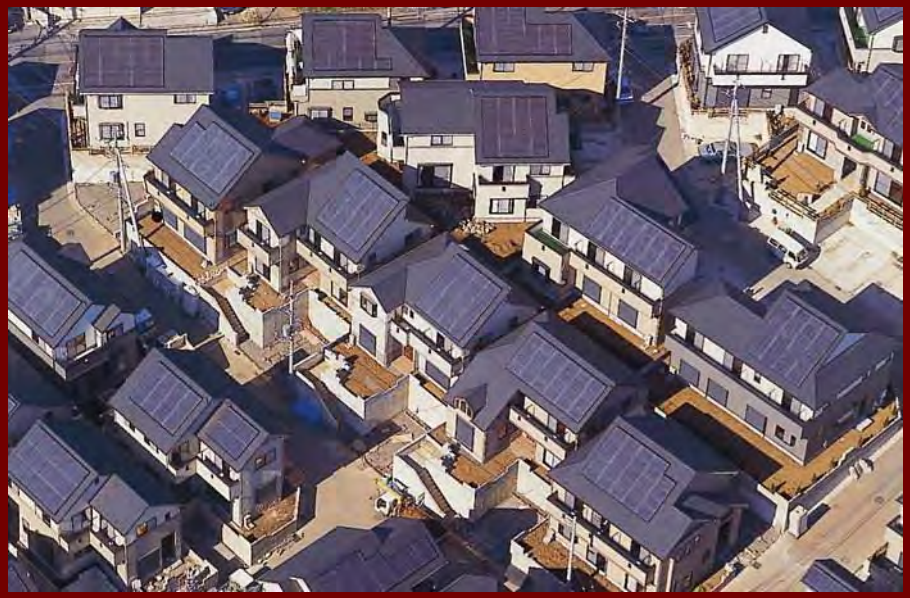
Human intervention to enhance sinks and reduce emissions.

Adaptation

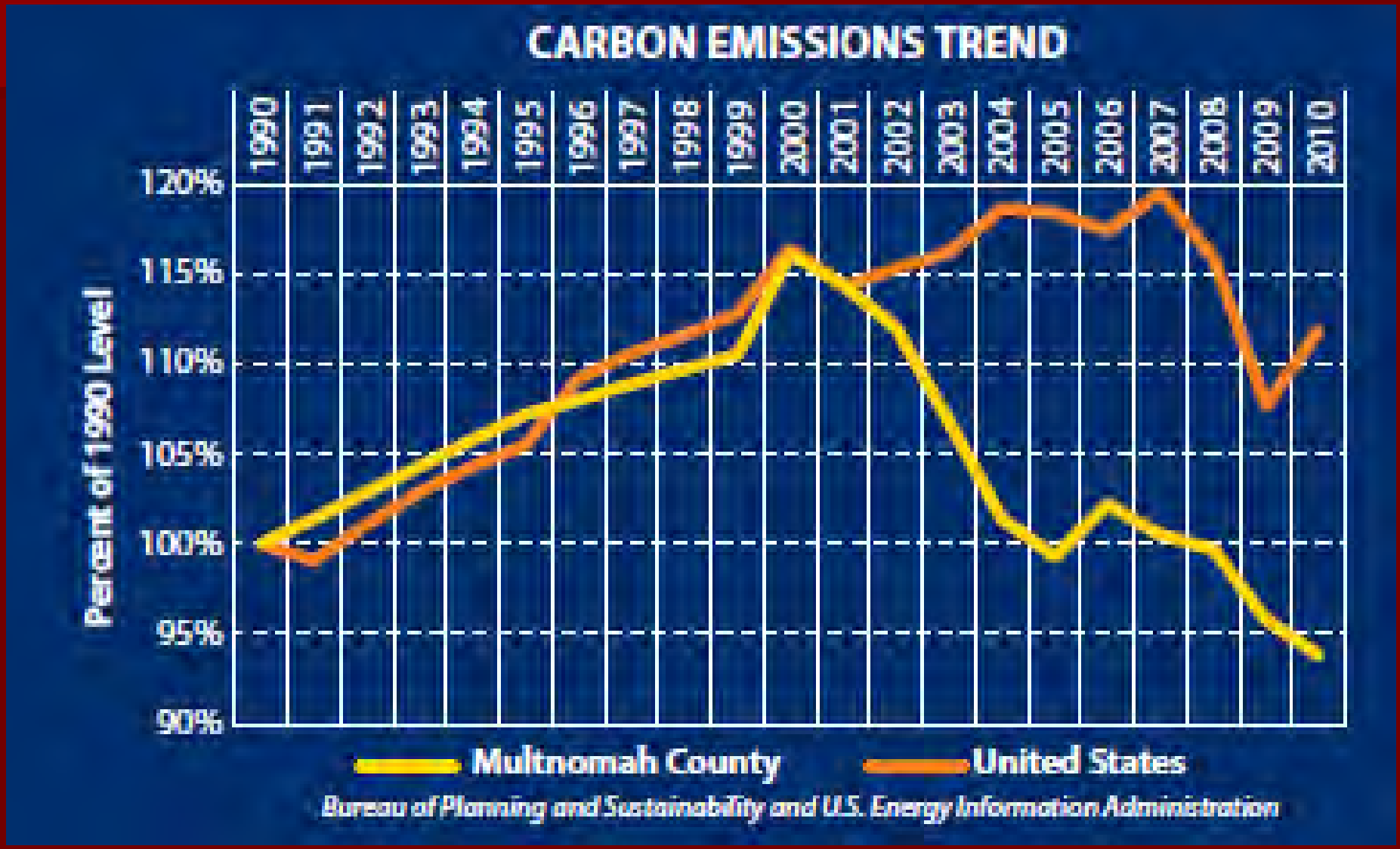
Germany

- 20% renewables
- 50% renewable last summer
- EU Cap and Trade
- Feed-in Tariff

- 3% reduction in CO2 since 2011 despite closing 8 nuclear reactors



Multnomah County CO2 Emissions

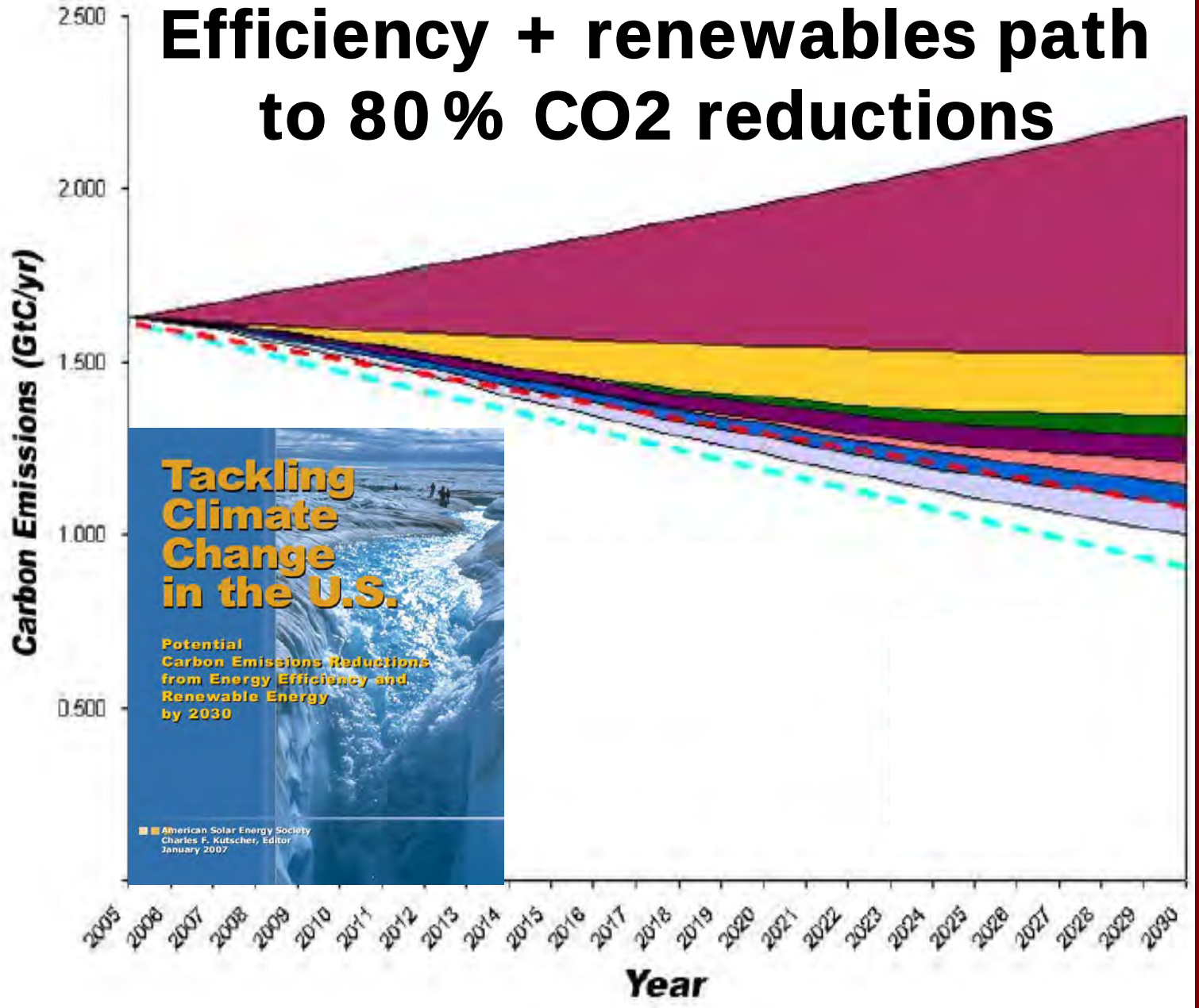


City of Portland/Multnomah Co.

- 85% mass transit growth
- Gasoline purchases <1990 levels
- 60% Recycling rate
- 1,800 home and 10,000 multifamily units weatherized
- Per capita gas use down 9%
- Household energy use down 10%
- >15% clean energy purchase
- 760,000 trees planted
- 1400 homes/biz with solar

Other solutions to reduce carbon emissions

Efficiency + renewables path to 80% CO2 reductions



Efficiency

Wind

Biofuels

Biomass

Solar

CSP

Geothermal

80% reduction path

Best transportation efficiency is the energy you don't use

- Average food miles /item in Iowa=1,386

architecture 2030

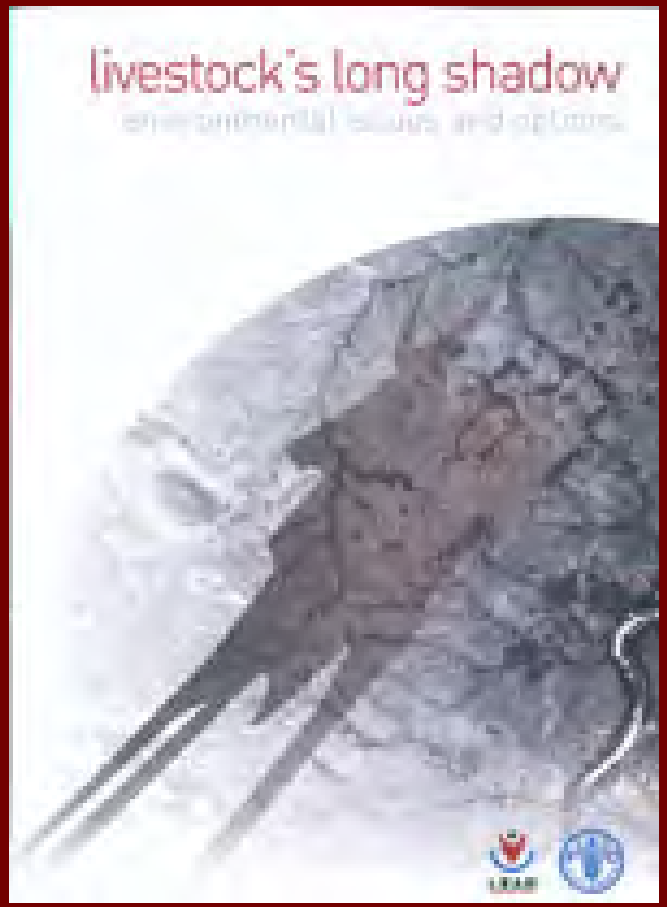
- Require all new buildings to use 50% less energy
- Increase efficiency by 10% each 5 years
- Net CO2 zero by 2030
- Roughly 3% are new or reconditioned each year and 1% torn down

Mount Airy, NC library

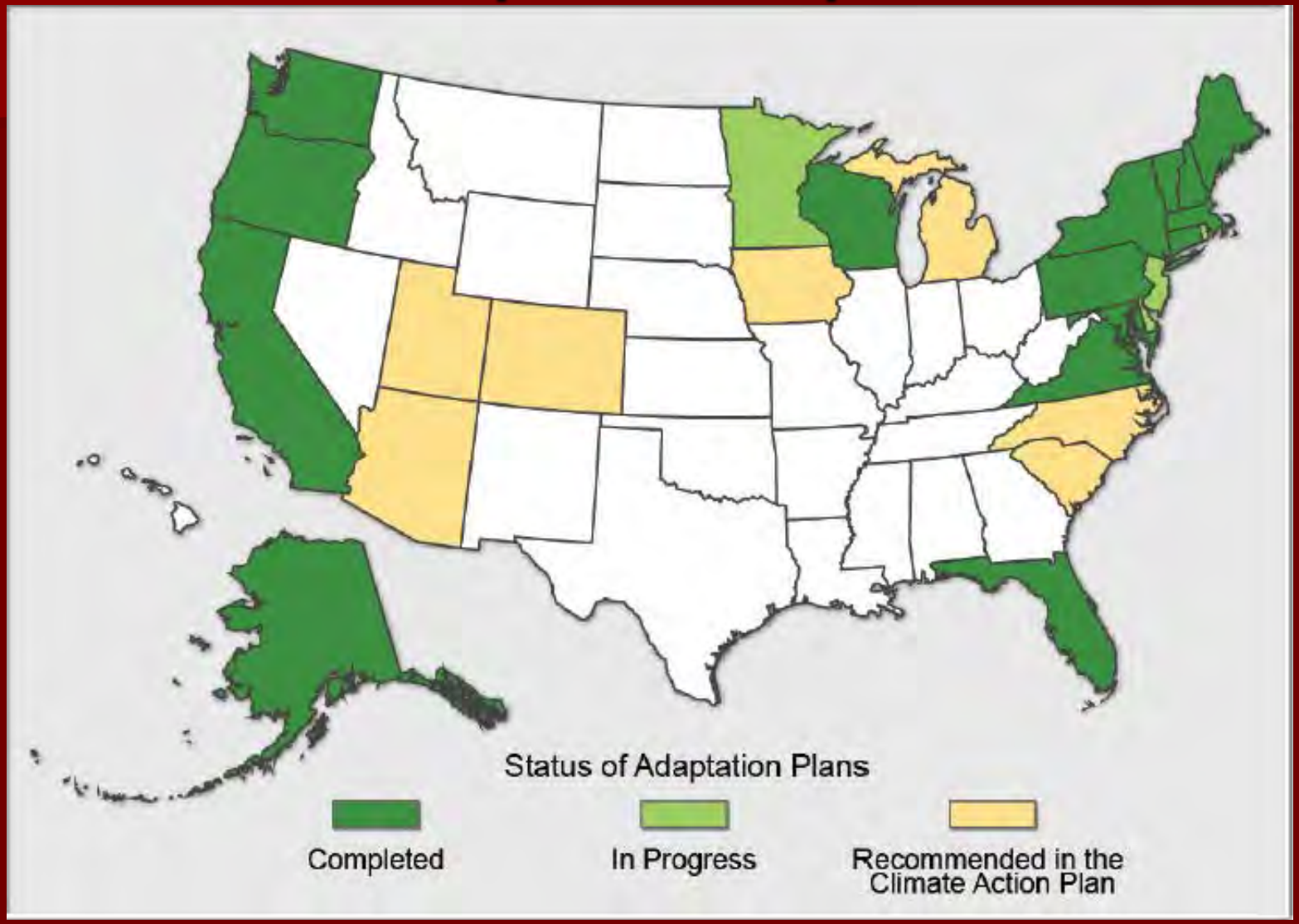
Building Efficiency

Agriculture

- 18% world wide source CO_2 equivalent
- ½ of which is loss of CO_2 sinks with land degradation
- Cut the meat!



Adaptation plans



National Climate Assessment 2013

Other Benefits

- Health & Aesthetic benefits to Cutting CO2
  - **Improved air and water quality**
  - **Reduce traffic**
  - **Tree-planting**
- Economics
- Keep energy dollar in local economy
- Saving $$

Join Together for Change

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