



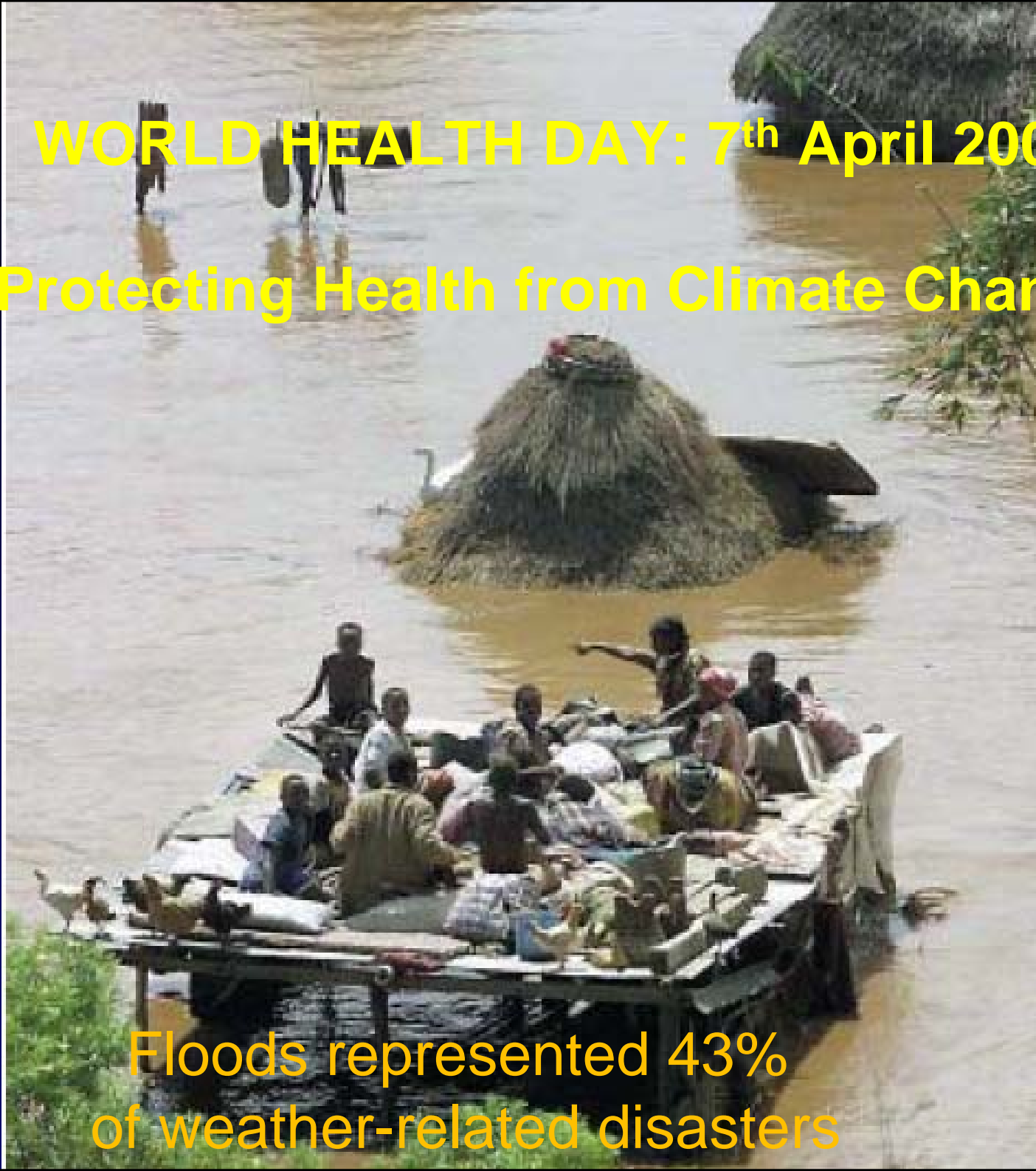
Impacts of Global Warming on Health

Somsak Lolekha M.D., Ph.D.

Mae Khong River Jan 2008

WORLD HEALTH DAY: 7th April 2008

Protecting Health from Climate Change



**Mozambic
March 2000**

**Floods represented 43%
of weather-related disasters**

Climate change

- Widespread scientific consensus that world's climate is changing – associated rises in
 - Mean temperatures
 - Sea level
 - Climate variability
- Concern about increased occurrence of severe storms, forest fires, and heat waves

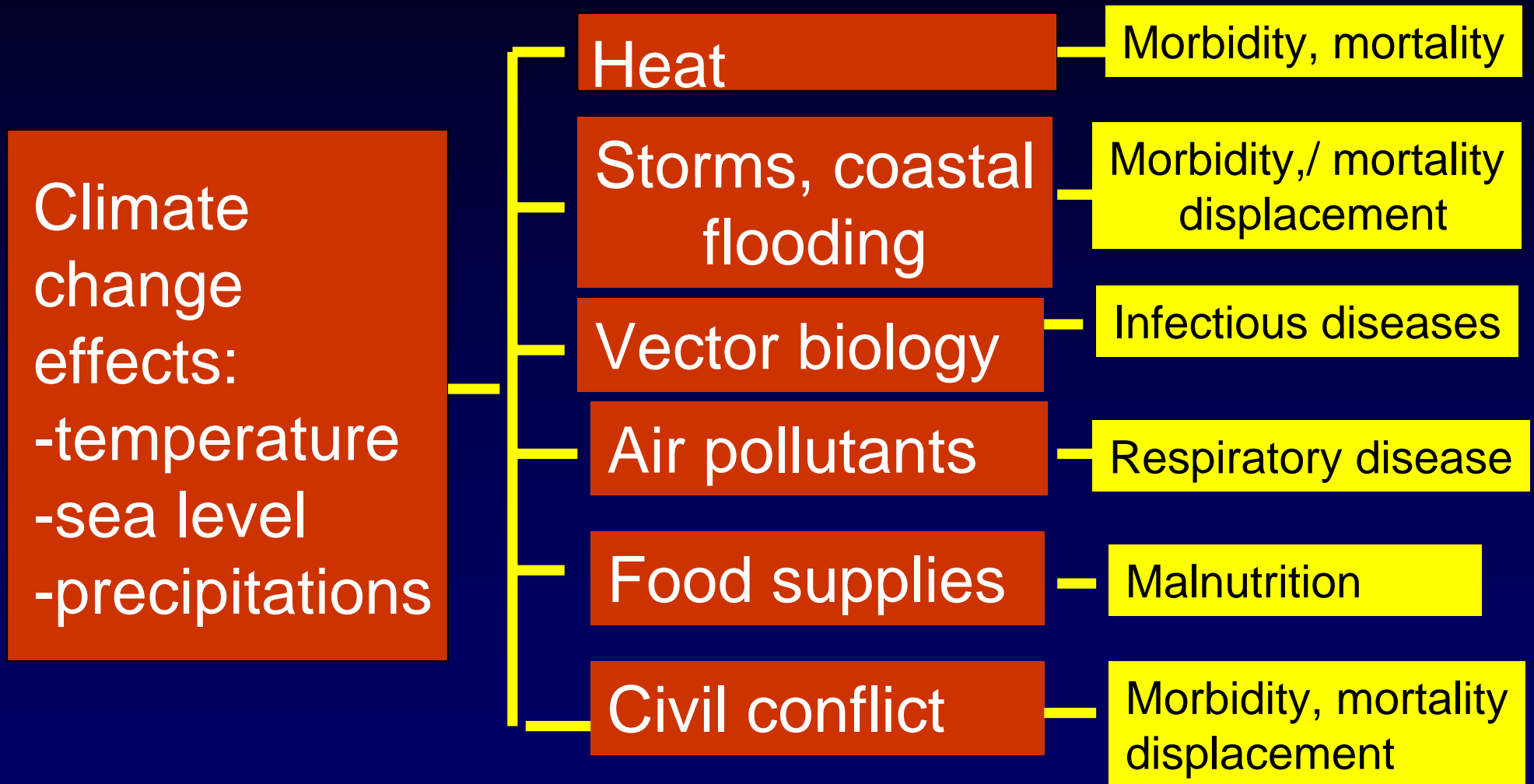
Intergovernmental Panel on Climate Change (IPCC)

- Global average surface temperature will rise by 1.4 C to 5.8 C between 1900 and 2100
- Land area will warm more rapidly than the oceans, particularly at high latitudes.(between 40N and 70N)
- Precipitation will increase globally, with heavy precipitation over most land areas; in some areas precipitation will decline
- Sea level will rise by 9-88 centimeters between 1990-2100
- Extreme weather events such as heat-waves, heavy rains, floods, droughts, more ferocious hurricanes and typhoons, and drying out of soil at mid latitudes will likely to increase

Effects of Climate Change

- Glaciers are in rapid retreat
- Arctic sea ice is melting
- Sea level has increased 1 to 2 mm/years.
- Oceans are acidifying as atmospheric carbon dioxide is absorbed by the marine buffer system.
- Ecosystems and individual species are being affected.
- Changes in temperature affect the density and range of species

Potential Impacts of Climate Change on Human Health



Leadership in climate change

- Research
 - Study and predict link between climate change and health
- Assessment
 - Monitor health – track diseases and trends related to climate change
 - Diagnose and investigate – Investigate infectious water, food, and vector borne outbreak

Leadership in climate change

- Policy development
 - Inform, educate, empower- credible resource on health consequence of climate change
 - Mobilize community partnership – partnership with private sector, civic group, NGOs, faith community etc.
 - Develop policy – heat wave, severe storm response plans
- Assurance
 - Enforce law
 - Link to/ provide care
 - Assure competence work force- public health workforce prepare to respond
 - Evaluate

Ten essential public health services to be used to anticipate, manage, and remedy the problems that can result from climate change

- Monitor the health status of the community
- Investigate and diagnose health problems and hazards
- Inform and educate people regarding health issues.
- Mobilize partnerships to solve community problems
- Support policies and plans to achieve health goals.

Ten essential public health services to be used to anticipate, manage, and remedy the problems that can result from climate change

- Enforce laws and regulations to protect health and safety.
- Link people to needed personal health services.
- Ensure a skilled, competent public health workforce.
- Evaluate effectiveness, accessibility, and quality of health services.
- Research and apply innovative solutions

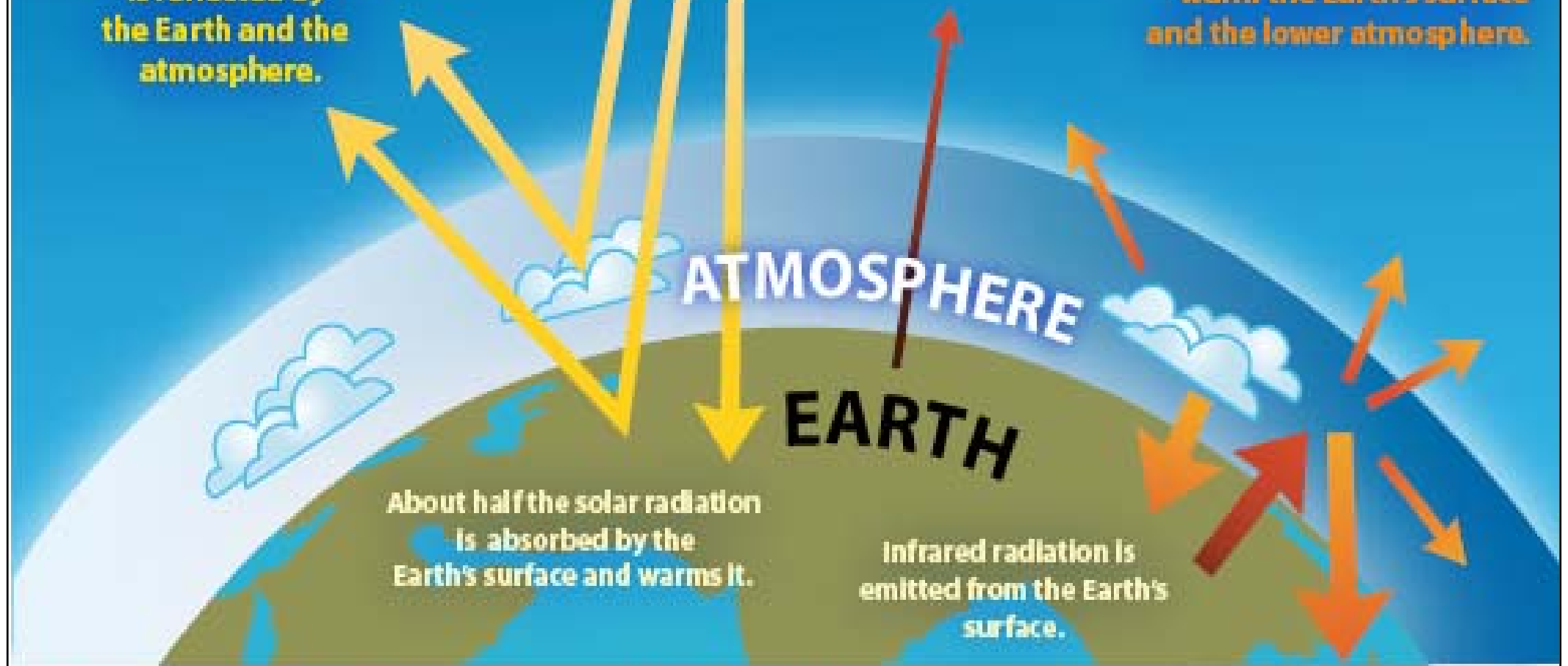
The Greenhouse Effect

Solar radiation powers the climate system.



Some solar radiation is reflected by the Earth and the atmosphere.

Some of the infrared radiation passes through the atmosphere but most is absorbed and re-emitted in all directions by greenhouse gas molecules and clouds. The effect of this is to warm the Earth's surface and the lower atmosphere.

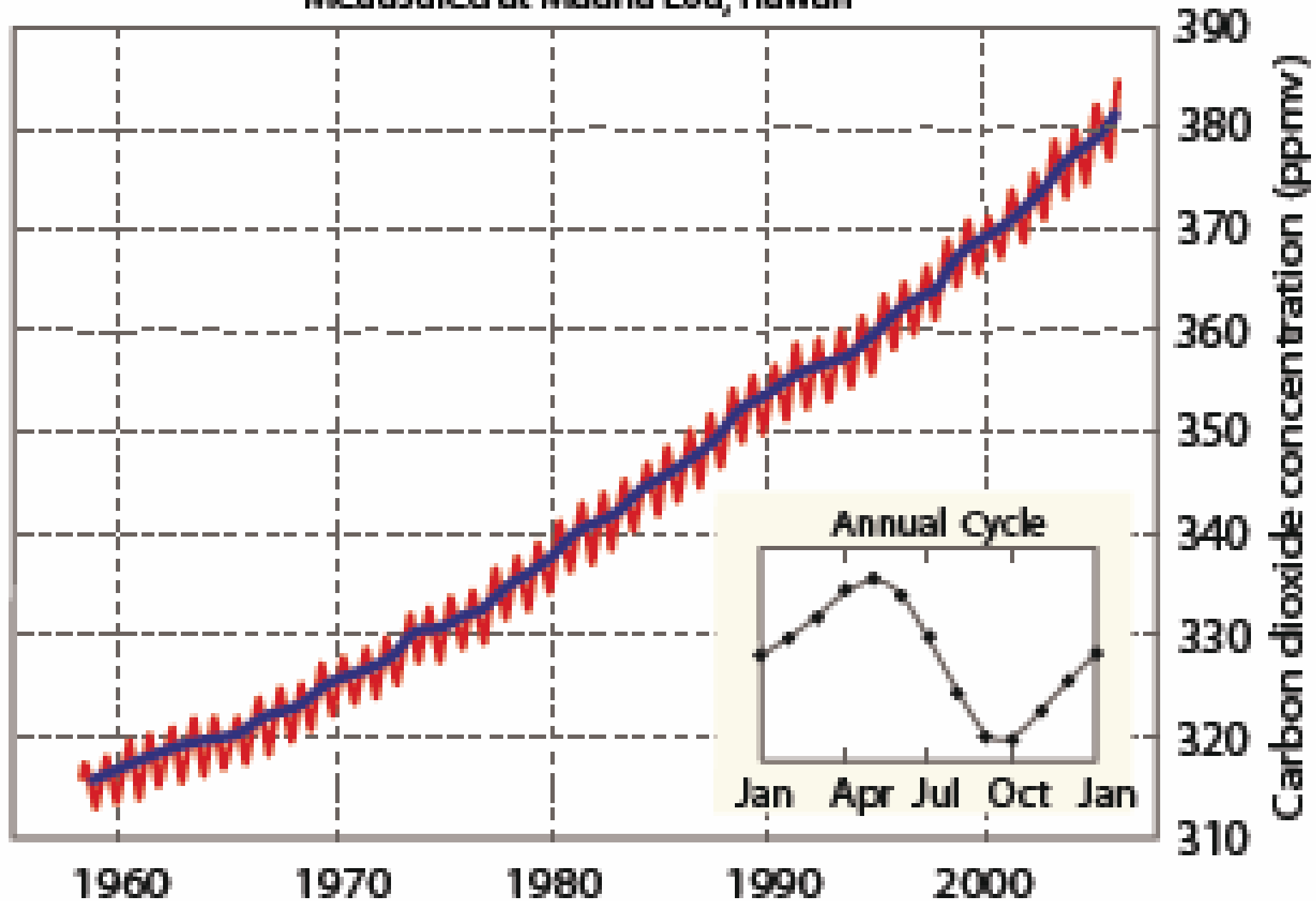


About half the solar radiation is absorbed by the Earth's surface and warms it.

Infrared radiation is emitted from the Earth's surface.

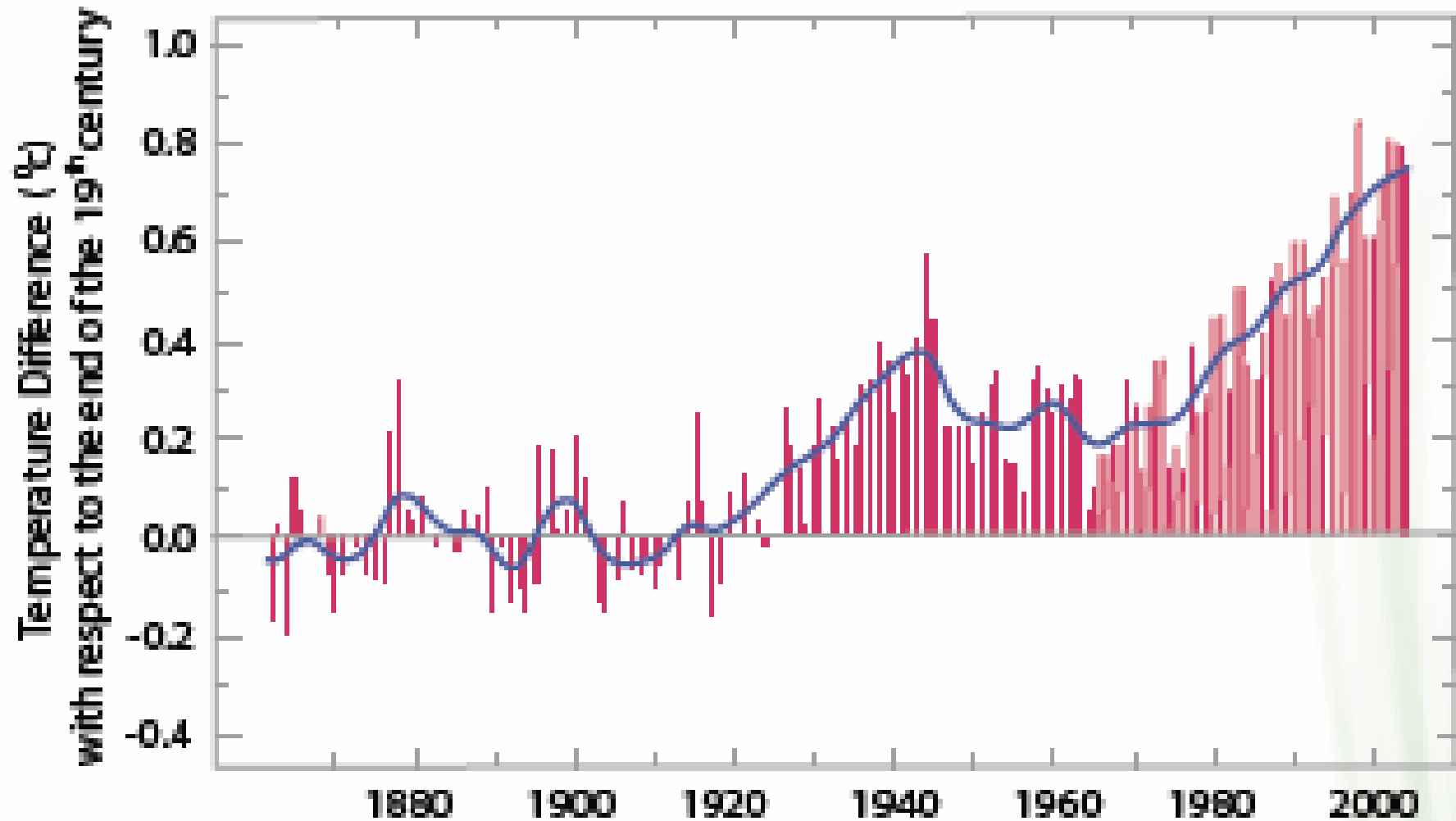
Atmospheric Carbon Dioxide

Measured at Mauna Loa, Hawaii ¹



Temperature Variations*

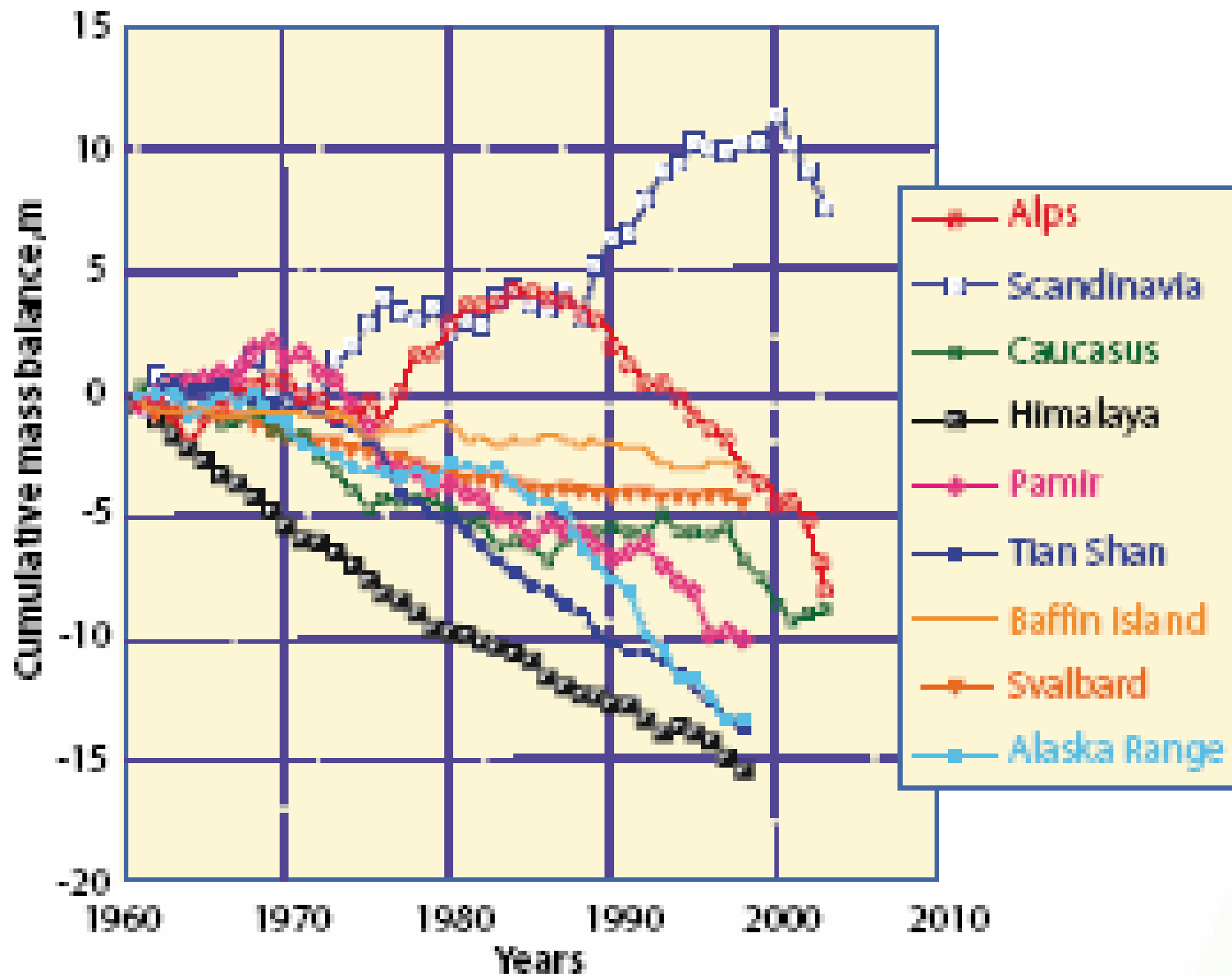
Global Average Near-Surface Temperatures 1850–2007



Hadley Centre for Climate Prediction and Research

Source: © British Crown Copyright 2008, the Met Office

Glacier Melting Rates



TIME

SPECIAL DOUBLE ISSUE



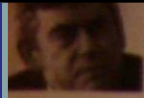
The Global Warming Survival Guide

10 Things You Can Do to Make a Difference

April 9, 2007

Things you can do to Make a Difference

- Turn food into fuel
- Change your lightbulbs to the compact fluorescent lightbulb
- Dry your clothes the natural way, by hanging them on a line.
- Let employees work close to home
- Ride the bus.
- Pay your bills online
- Open a window
- Just say no to plastic bags
- Switch-off the lights at quitting time



Why Gordon
Brown Is Crazy
About the U.S.

Is America's
White Working
Class Bitter?



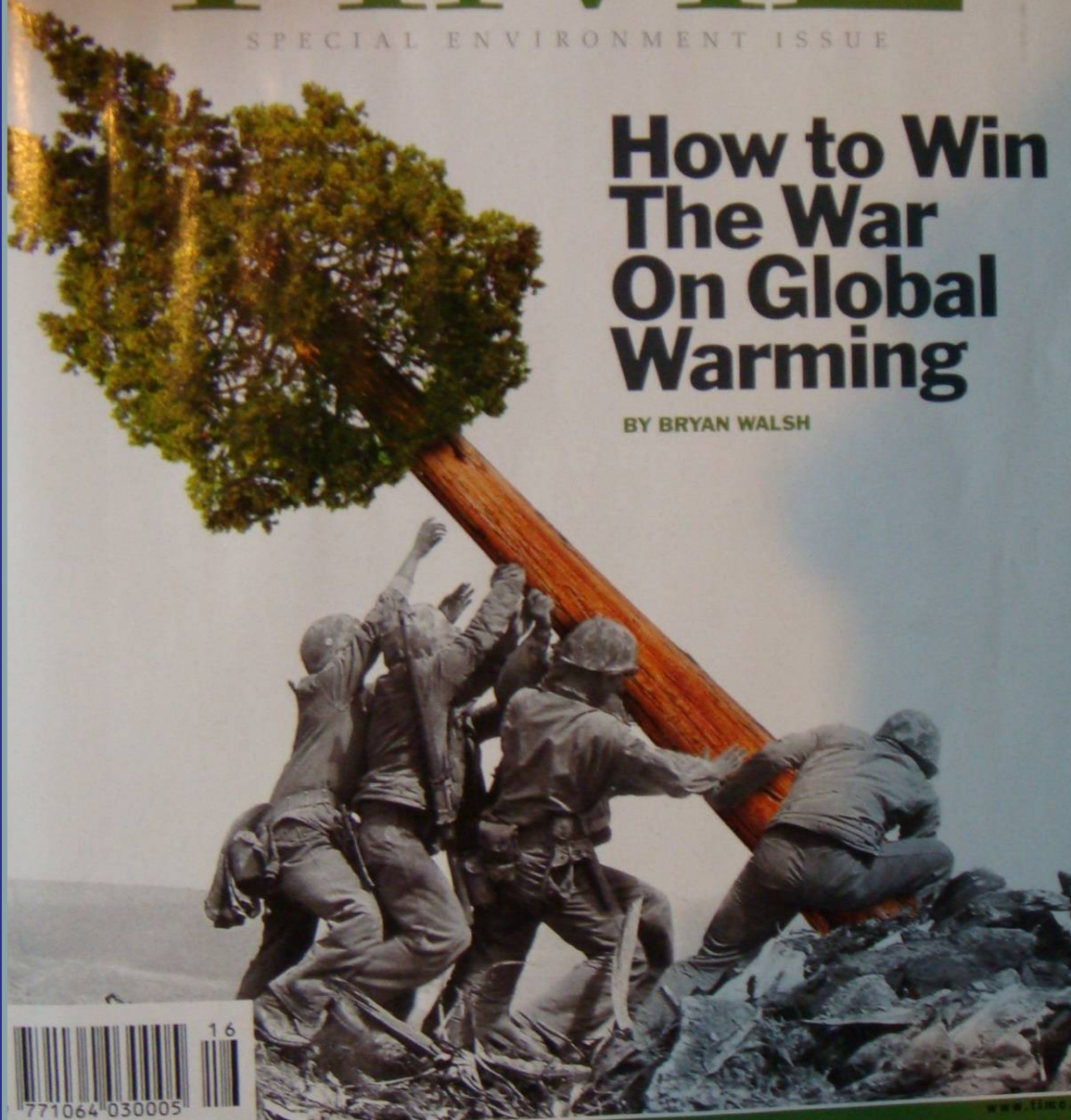
Ethnic Unrest
Grows in the Far
West of China

TIME

SPECIAL ENVIRONMENT ISSUE

How to Win The War On Global Warming

BY BRYAN WALSH



www.time.com

Solving Global Warming

- Boost Energy Efficiency
 - Efficient Appliances Save Energy-and Money
 - Building Green : From Principle to Practice
 - Reduce your energy consumption
- Better Cars & Smart Growth
- Biofuels & Renewable Energy
- Return Carbon to the Ground

How to fight global warming

- Choose an efficient vehicle
- Drive smart, drive less
- Buy energy-efficient appliances
- Replace your light bulbs with compact fluorescent bulbs
- Weatherize your home or apartment
- Choose renewable energy
- Buy clean energy certificates

Climate change and potential impacts on health

- Heat waves
 - Heat stress
 - Extremes of age, athletes, people with respiratory diseases
- Extreme weather events, (rain, hurricane, tornado, flooding)
 - Injuries, drowning
 - Coastal, low-lying land dwellers, low SES
- Droughts, floods, increased mean temperature
 - Vector-, food- and water-borne diseases
 - Multiple populations at risk

Climate change and potential impacts on health

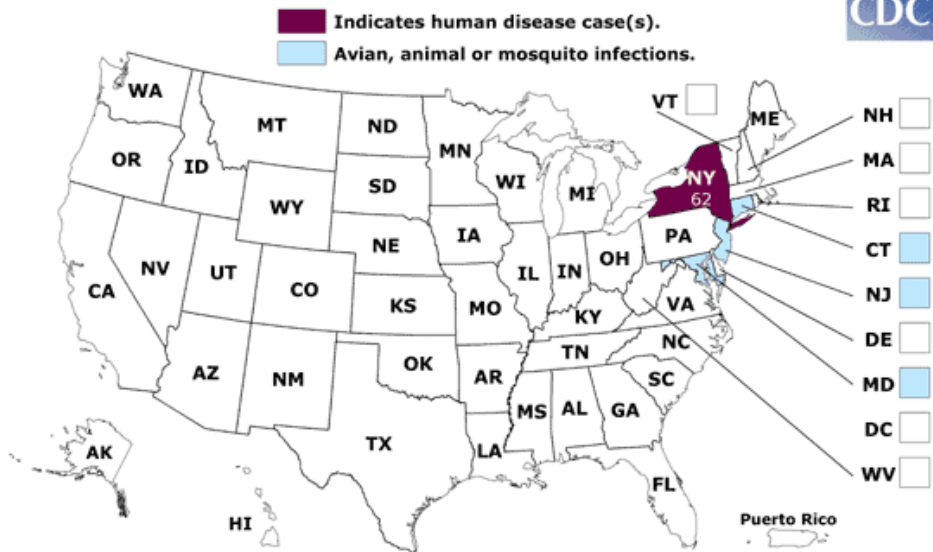
- Sea-level rise
 - Injuries, drowning, water and soil salinization, ecosystem and economic disruption
 - Coastal, low SES
- Drought, ecosystem migration
 - Food and water shortages, malnutrition
 - Low SES, elderly, children
- Extreme weather events, drought
 - Mass population movement, international conflict
 - General population

Climate change and potential impacts on health

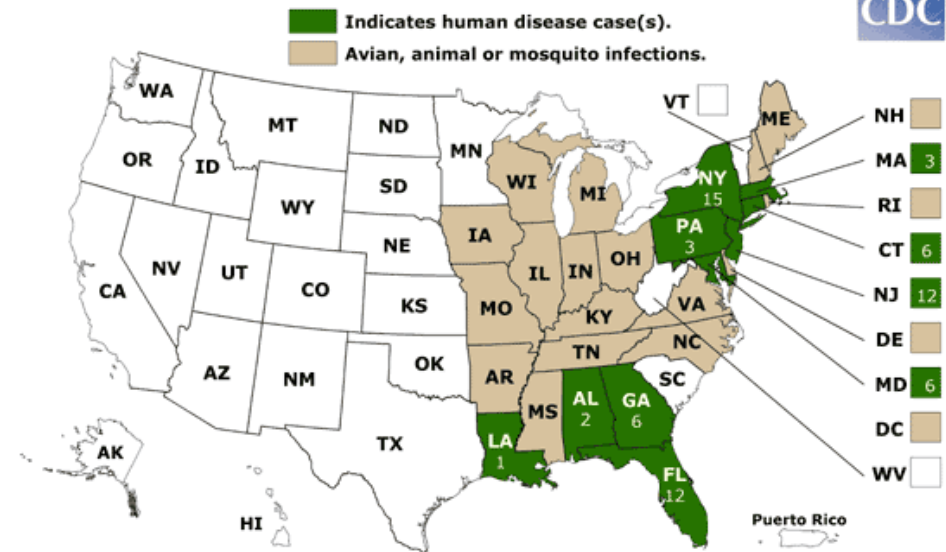
- Increases in ground-level ozone, airborne allergens, and other pollutants
 - Respiratory disease exacerbations (COPD, asthma, allergic rhinitis, bronchitis)
 - Elderly, children, those with respiratory disease
- Climate change generally; extreme events
 - Mental health
 - Young, displaced, agricultural sector, low SES

Global warming and impact on infectious diseases

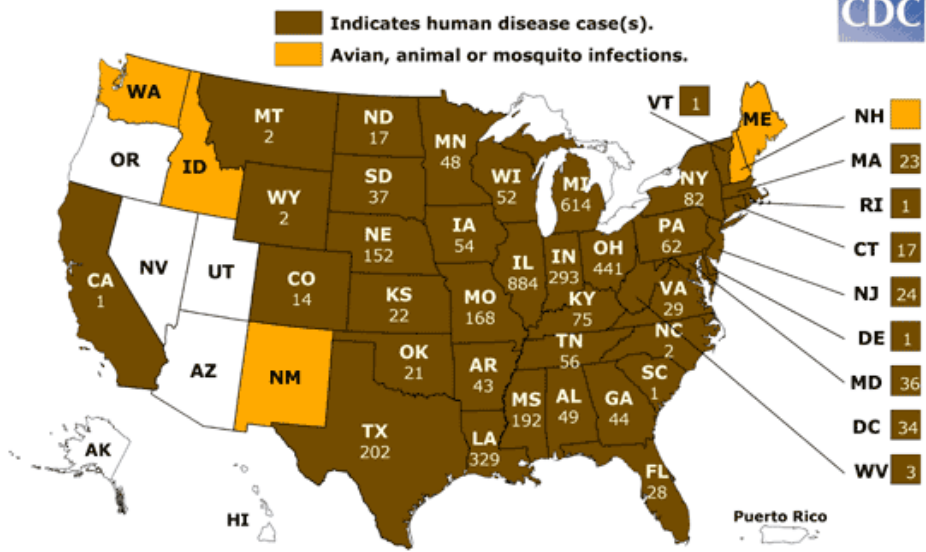
- Vector-borne diseases
 - Malaria
 - Dengue
 - Encephalitis
 - Lyme disease
- Water-borne diseases
 - Cholera
 - Amoeba



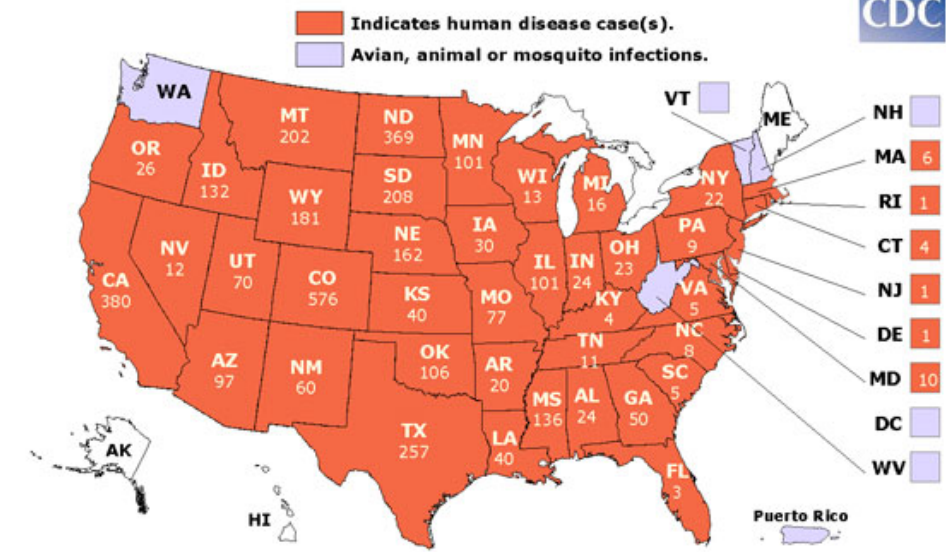
1999



2001



2002

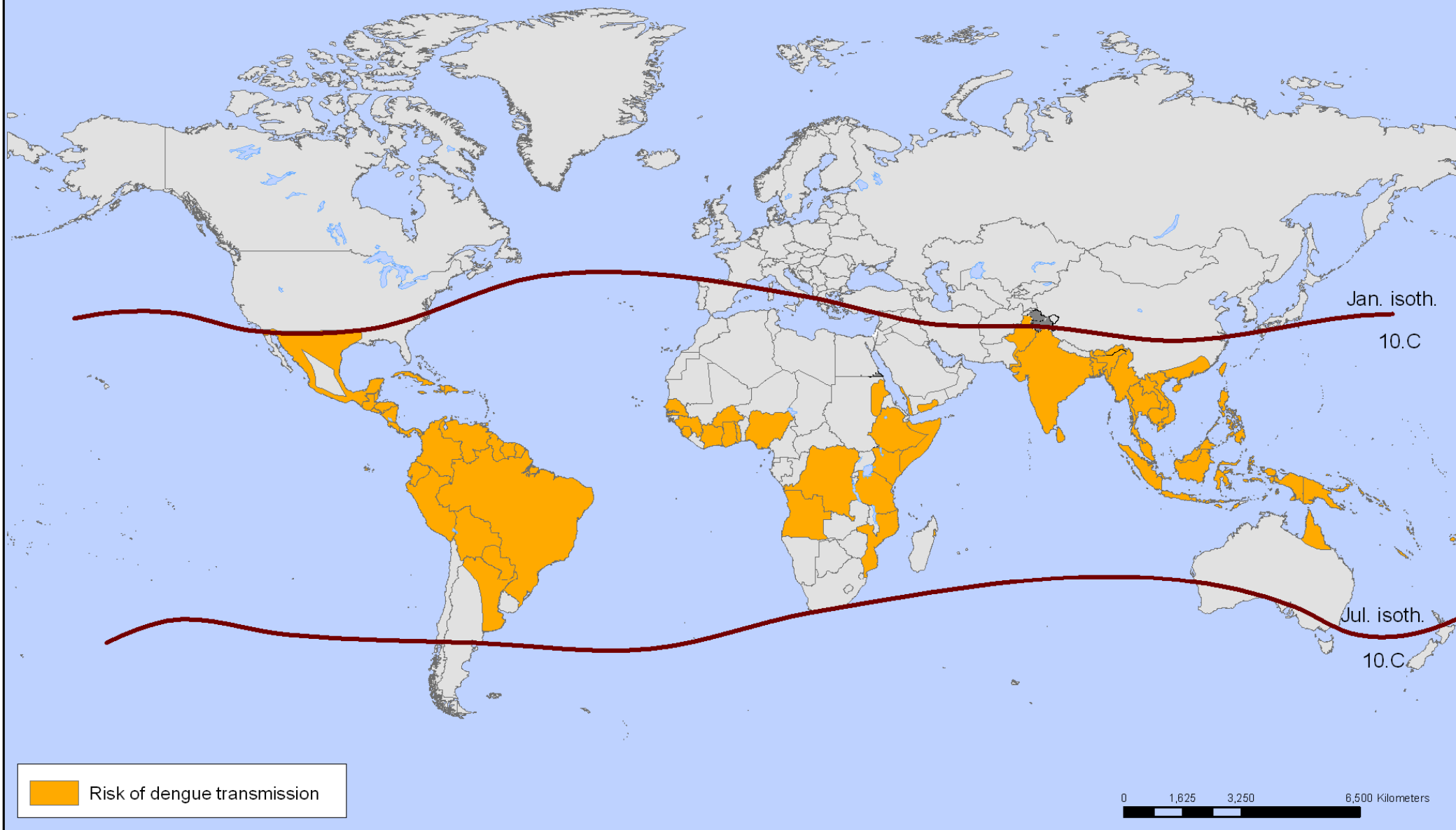


2007

West Nile Encephalitis in the USA 1999-2007

Year	Cases	Death
1999	62	7
2000	21	2
2001	66	9
2002	4156	284
2003	9862	264
2004	2539	100
2005	3000	119
2006	4269	177
2007	3623	134

Countries /areas at risk of dengue transmission, 2006



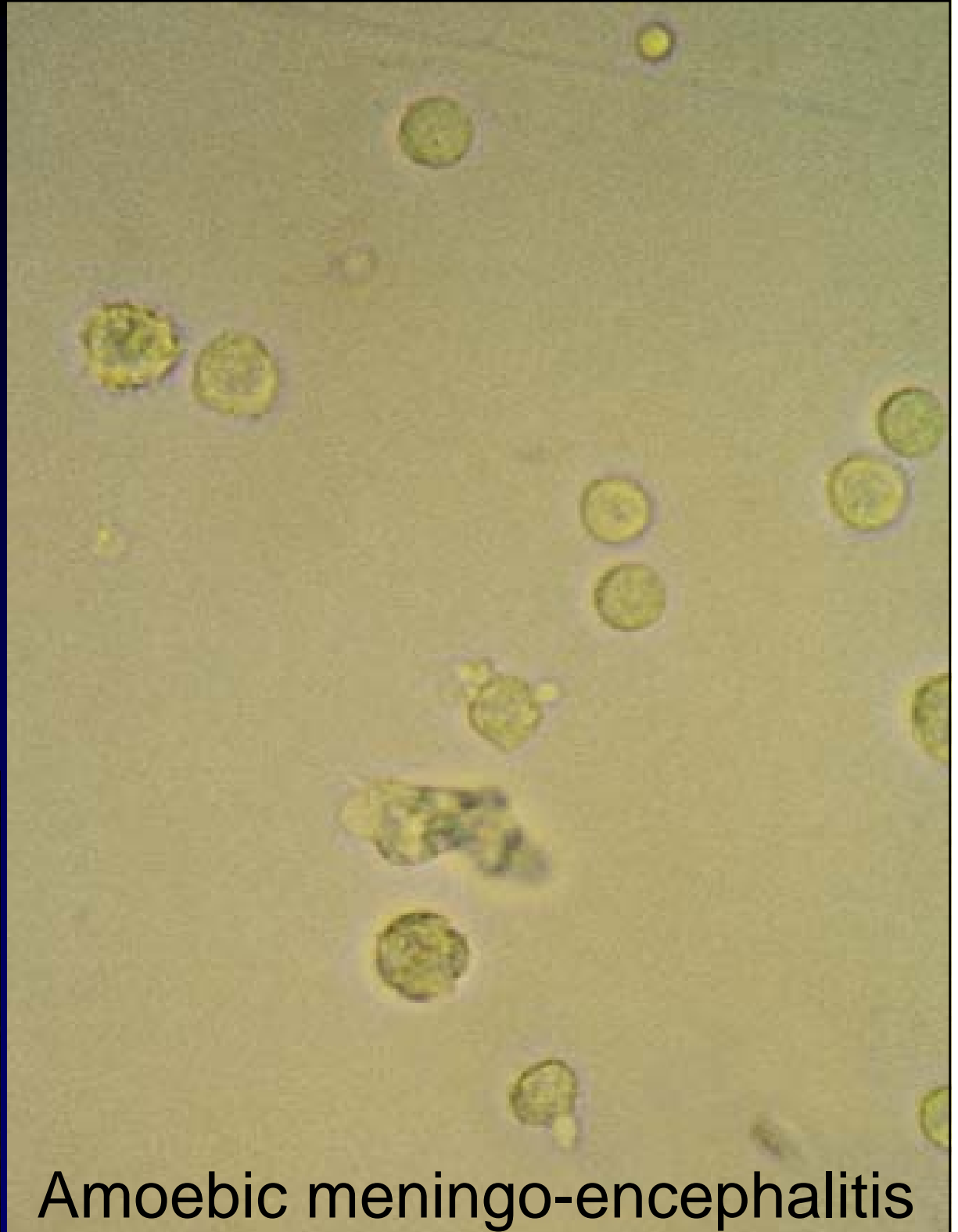
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

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Data Source: WHO
Map Production: Public Health Mapping and GIS
Communicable Diseases (CDS) World Health Organization

Global warming and impact on infectious diseases

- Vector-borne diseases
 - Malaria
 - Dengue
 - Encephalitis
- Water-borne diseases
 - Cholera
 - Amoeba



Amoebic meningo-encephalitis

Global warming preparedness

- Reduction or mitigation of the underlying hazardous exposure of global warming
- Prevention or adaptation to exposures that are unavoidable

PUBLIC HEALTH APPROACH

- Serve as a credible source of information on the health consequences of climate change for the Thai population and globally.
- Track data on environmental conditions, disease risks, and disease occurrence related to climate change.
- Expand capacity for modeling and forecasting health effects that may be climate-related.
- Enhance the science base to better understand the relationship between climate change and health outcomes.
- Identify locations and population groups at greatest risk for specific health threats, such as heat waves.

PUBLIC HEALTH APPROACH

- Communicate the health-related aspects of climate change, including risks and ways to reduce them, to the public, decision makers, and healthcare providers.
- Develop partnerships with other government agencies, the private sector, nongovernmental organizations, universities, and international organizations to more effectively address Thai and global health aspects of climate change.
- Provide leadership to state and local governments, community leaders, healthcare professionals, nongovernmental organizations, the faith-based communities, the private sector and the public, domestically and internationally, regarding health protection from climate change effects.

PUBLIC HEALTH APPROACH

- Develop and implement preparedness and response plans for health threats such as heat waves, severe weather events, and infectious diseases.
- Provide technical advice and support to state and local health departments, the private sector, and others in implementing national and global preparedness measures related to the health effects of climate change.
- Promote workforce development by helping to ensure the training of a new generation of competent, experienced public health staff to respond to the health threats posed by climate change.

An aerial photograph of a city skyline, featuring a prominent skyscraper with a distinctive top section. The sky is blue with light clouds. The text "Thank you for Your Attention" is overlaid in yellow, italicized font. In the foreground, a building with the "AJINOMOTO" logo is visible.

*Thank you
for
Your Attention*

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