

The Pacific Northwest and Climate Change

Health Effects of an
Inconvenient Truth

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Health of the Pacific Northwest

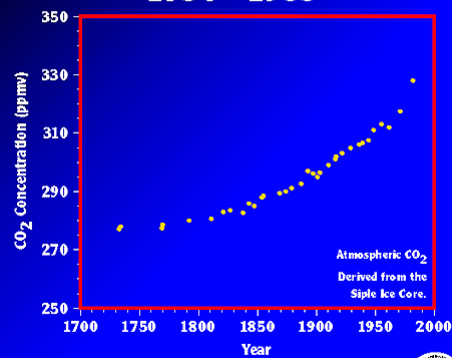
- What are global trends?
- What about PNW?
- Which diseases are particularly climate driven?
- Direct and Indirect effects on the PNW.

Globalization—ALWAYS the system for our weather



- In weather scaling to the local is most challenging
- PNW gets our weather from the Pacific with contributions from our neighbors
- We get our population from at home and abroad
- Globalization of disease Ongoing.

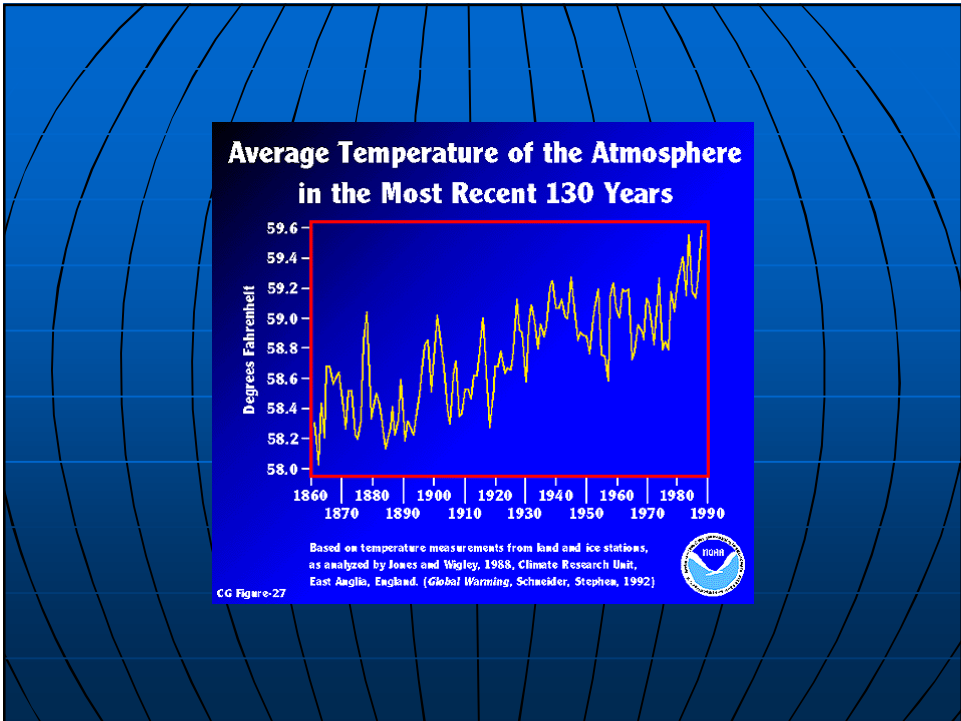
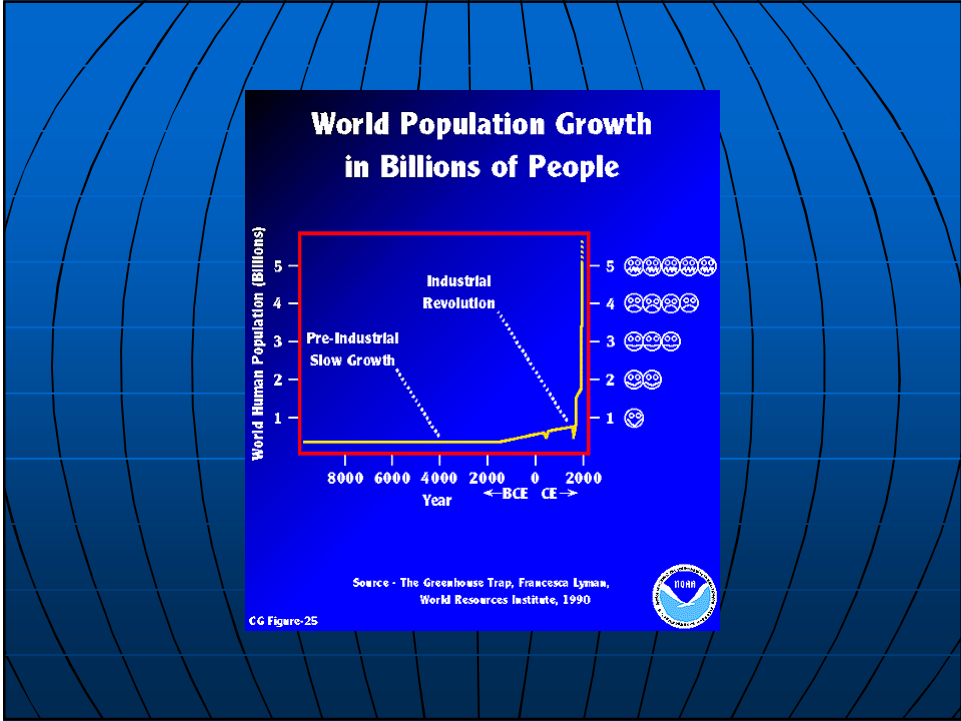
Atmospheric Carbon Dioxide Concentrations From Ice Cores 1734 - 1983

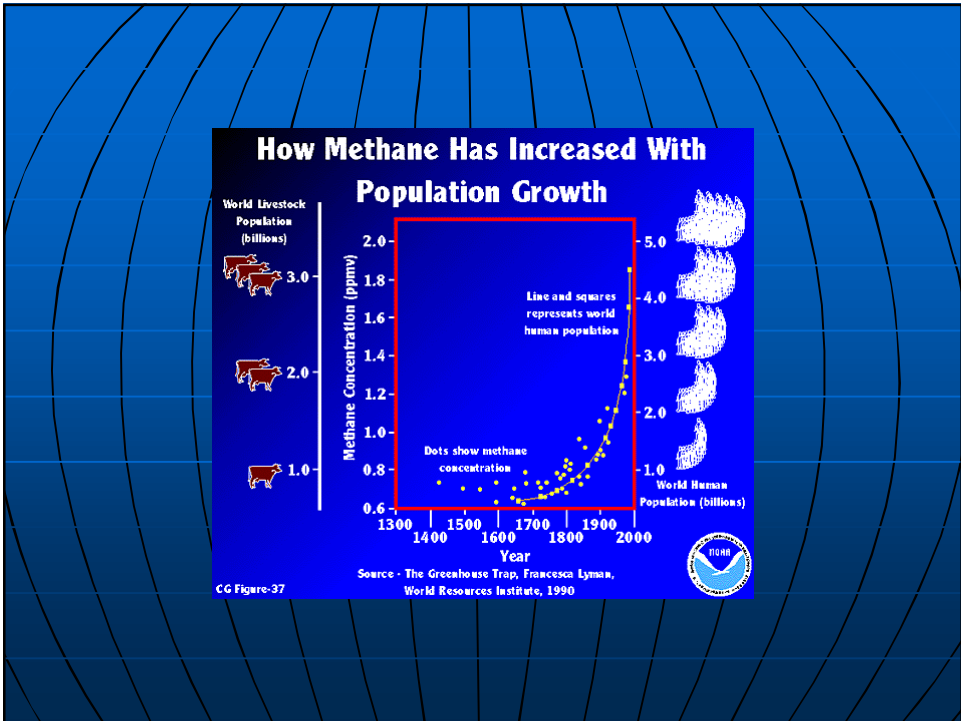
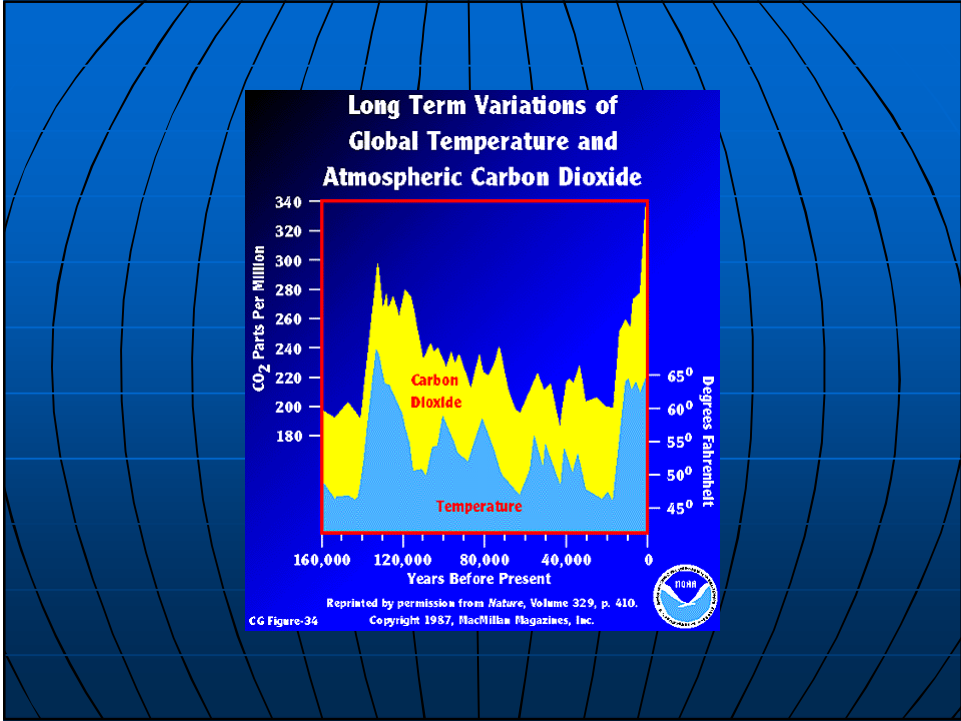


Source - A. Nofel and Bernard Stauffer, Siple Ice Station, Physics Institute, University of Bern, Bern, Switzerland, Trends '92

CG Figure-24



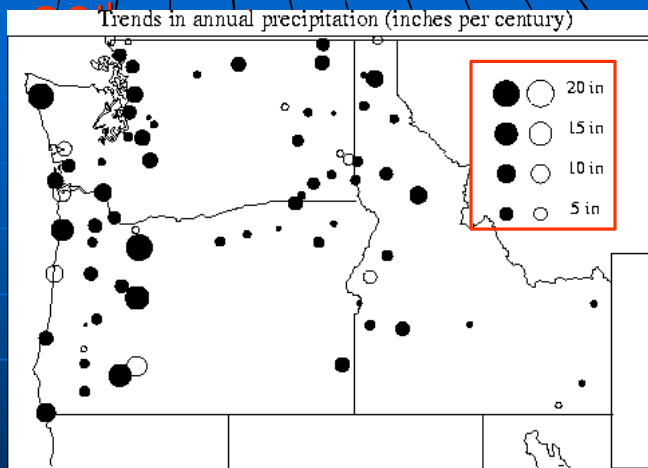




Precipitation trends in the PNW

- 76 stations with long records
- Most stations becoming wetter
- Average: +2.9 inches (14%)

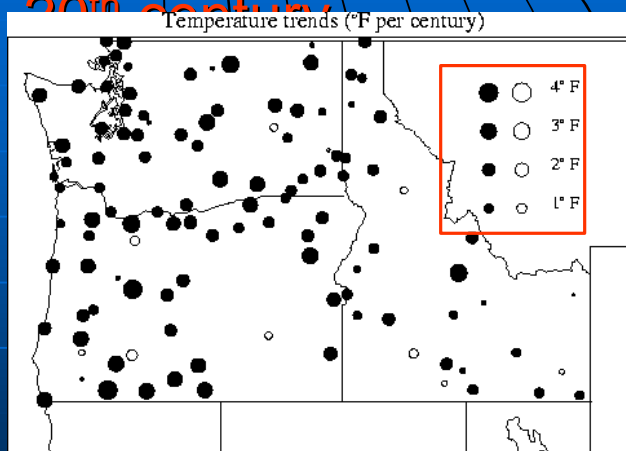
- Positive trend
- Negative trend



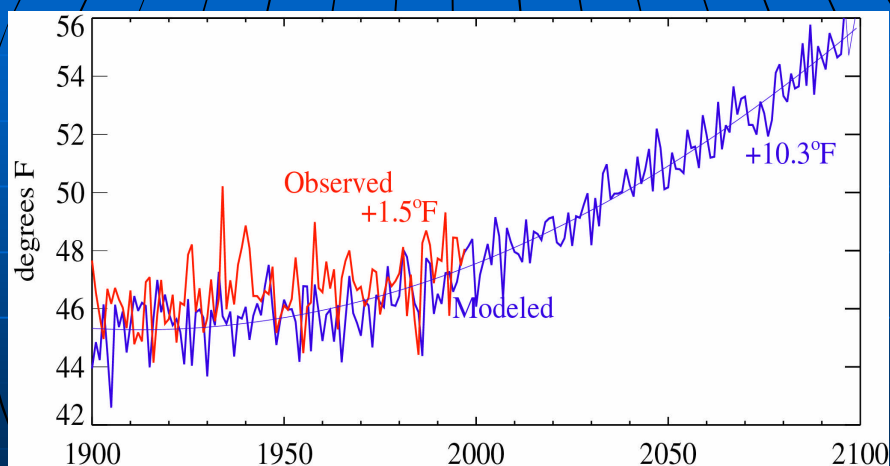
Temperature trends in the PNW

- US Historical Climate Network data
- 113 stations with long records
- Almost every station shows warming
- Regional average: 1.5° F/century

- Positive trend
- Negative trend

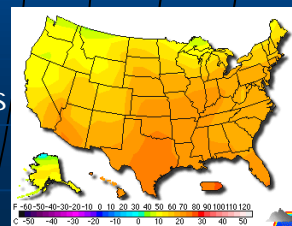


PNW temperature trend



Impact in Washington

- Longer growing season
- Increased winter flooding and landslides
- Reduced snowpack: good for transportation, bad for summer water supply (which relies on snowmelt)
- Higher in-stream and coastal ocean temperatures and reduced coastal upwelling mean generally less favorable conditions for salmon and other cold-water species
- Diminished forest vitality especially east of the Cascades owing to increases in drought stress, pest infestations, and forest fires



Climate----Human Disease Risks

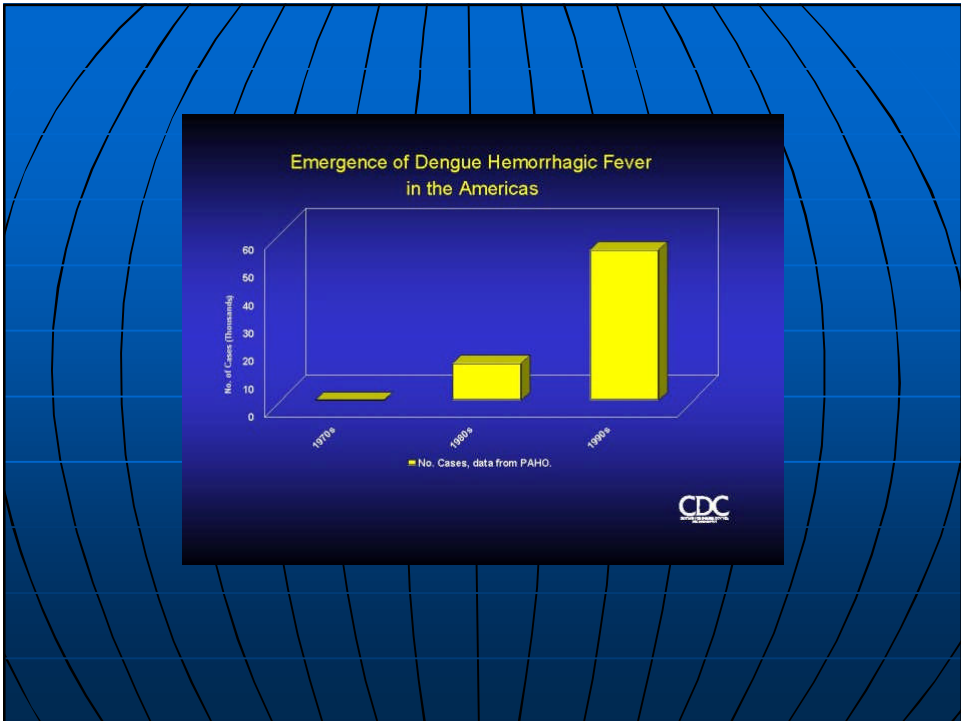
- Warmer, wetter, better medium for bacteria?
- Better for Vectors?
- Introduction of new illnesses: in-migration
- Increased risk of Seasonal Affective Disorder
- Smog and particulates from Asia with cardiac illness and stroke

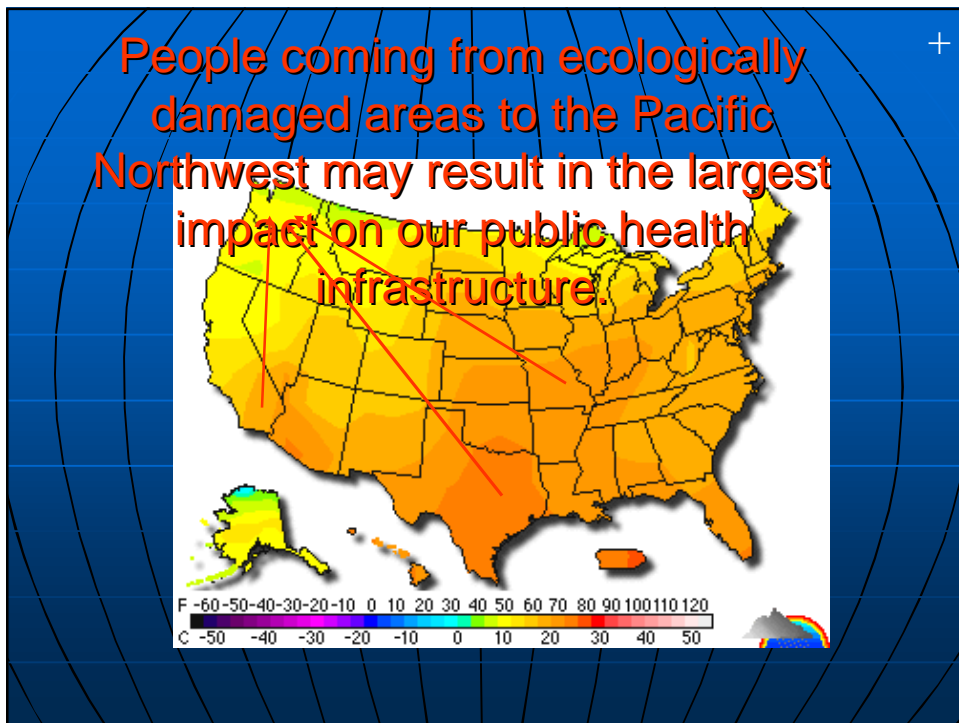
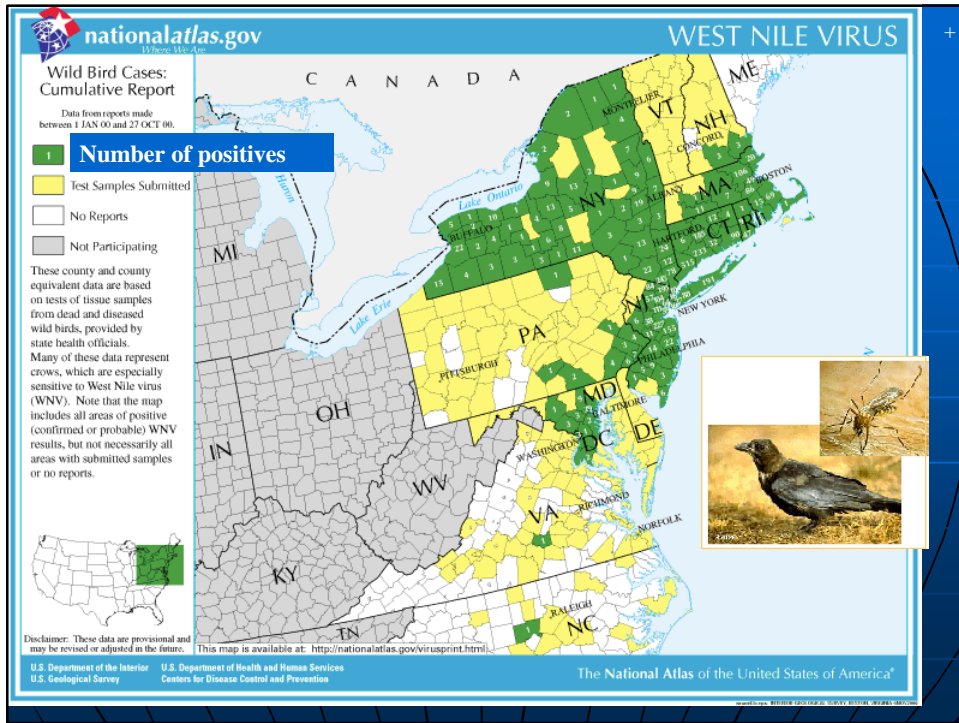


Expansion of Vector Borne Disease

- Need the RIGHT VECTORS..i.e. not all mosquitoes are bad (*most are*)
- Need the presence of the pathogen, comes in in vertebrate host







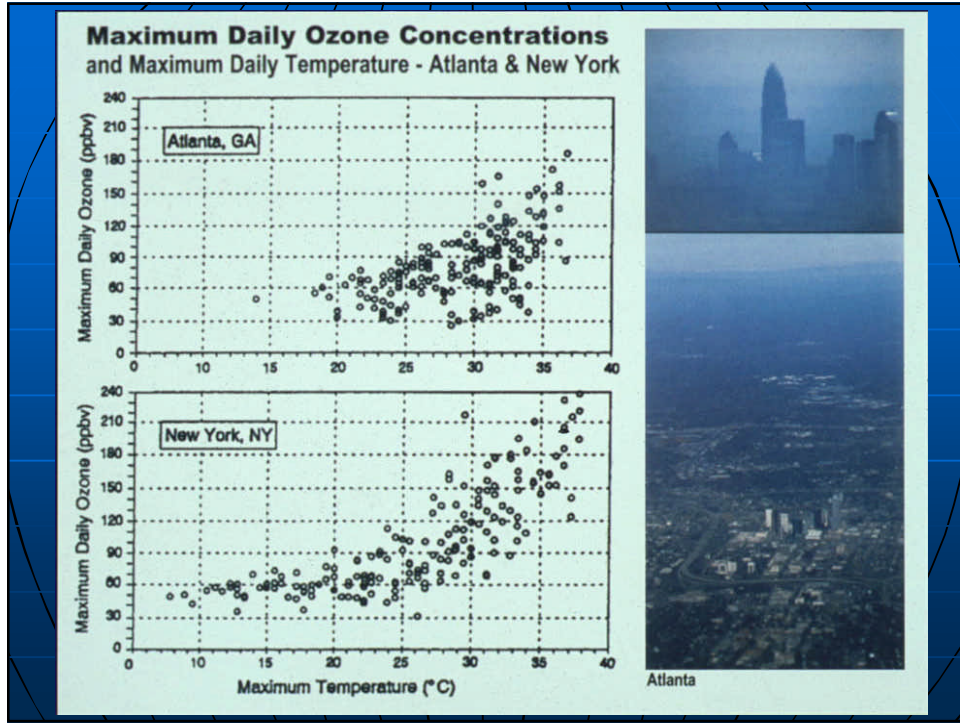
Global warming and human health

Chapter 2

- Indirect events
 - Increased air pollution and respiratory diseases
 - Growth & dispersion of fungal spores increased allergies
 - Rising sea levels: erosion

Tuvalu - 11,000 carbon refugees





Asthma outbreak hits kids RISKS OF THE 'RED ZONE'

ENNI GRIFFMAN / Staff

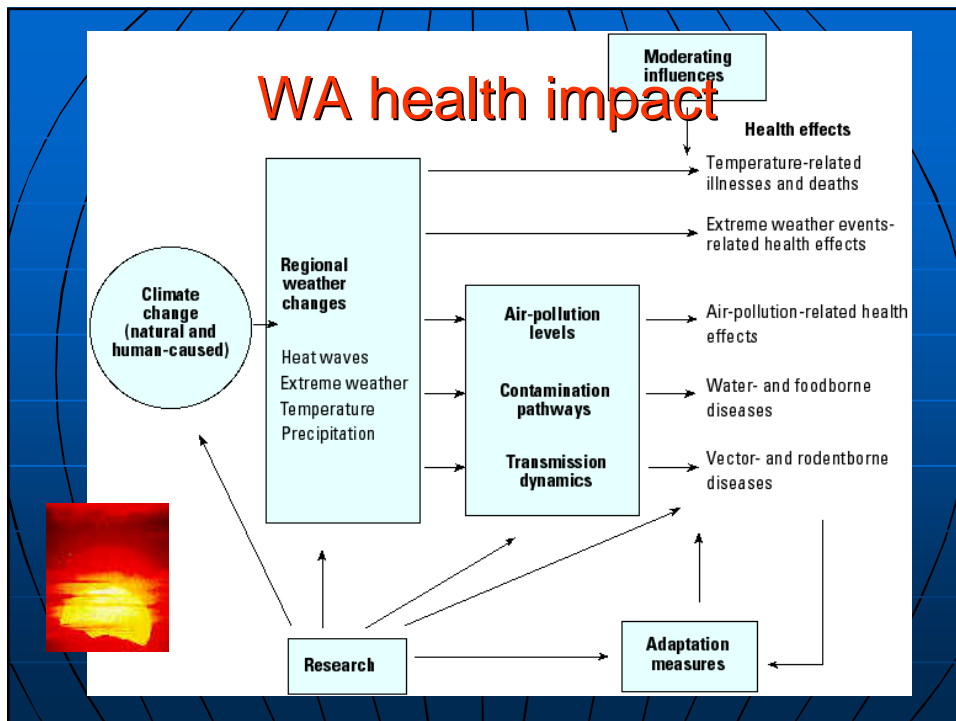
Asthma sufferer Tyrone Johnson, 2, breathes fresh air Friday as his aunt Susan Thomas tends him at Atlanta's Hughes Spalding Children's Hospital. Sky-high smog readings in metro Atlanta have produced a flare-up of asthma cases, especially among children.

The Atlanta Journal-Constitution SATURDAY, AUG. 19, 2000

We share particulates and SO₂ with Asia

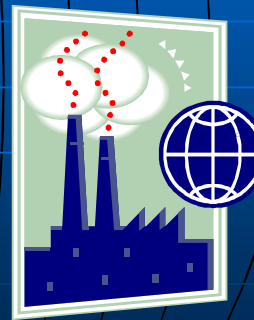


Emissions: Nanjing and Los Angeles, 2005

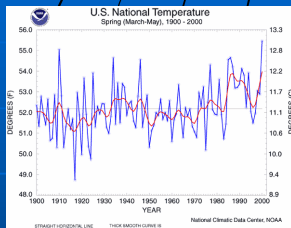


What do we need to know

- Early alert, surveillance
- What behavioral interface will do, can do to vector/human exposure
- Timeline of warming, how to plan
- Define systems at risk, begin operations research to find what works.



What can be done?



- Surveillance
- Prediction-scenario 
- Coping-outreach to Asia Pacific
- Reduction in Global Warming

