

# Climate Change and Health

Rising to the challenge in Washington

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University of Washington  
CHE WA Meeting  
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How did I get here?

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## Two WA State Initiatives

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- ▣ House Bill 1303 (Climate change scenarios and sector impacts)
- ▣ Governor's Climate Challenge (Preparation and Adaptation Work Groups: PAWGs)

Objective: estimate impacts of climate change in Washington State in near, mid and long term

## Climate Change and Human Health Impact Team (CHIT)

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Coordinates the efforts of the Human Health PAWG and the HB1303 health sector  
Roger Rosenblatt, UW Family Medicine  
Gregg Grunenfelder, WA Dept. of Health

Multidisciplinary team composed of five researchers, each leading a topic area

## CHIT Researchers

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### **CHIT**

Roger Rosenblatt, UW Family Medicine  
Elizabeth Jackson, UW Sociology/Family Medicine  
Catherine Karr, UW Pediatrics/ Env. Occ Health Sciences  
Ann Marie Kimball, UW Epidemiology/Health Services  
Richard Fenske, UW Environmental & Occupational Health  
Sciences

### **JISAO/CIG**

Phil Mote  
Eric Salathe  
Lara Whitely Binder

## CHIT First Steps

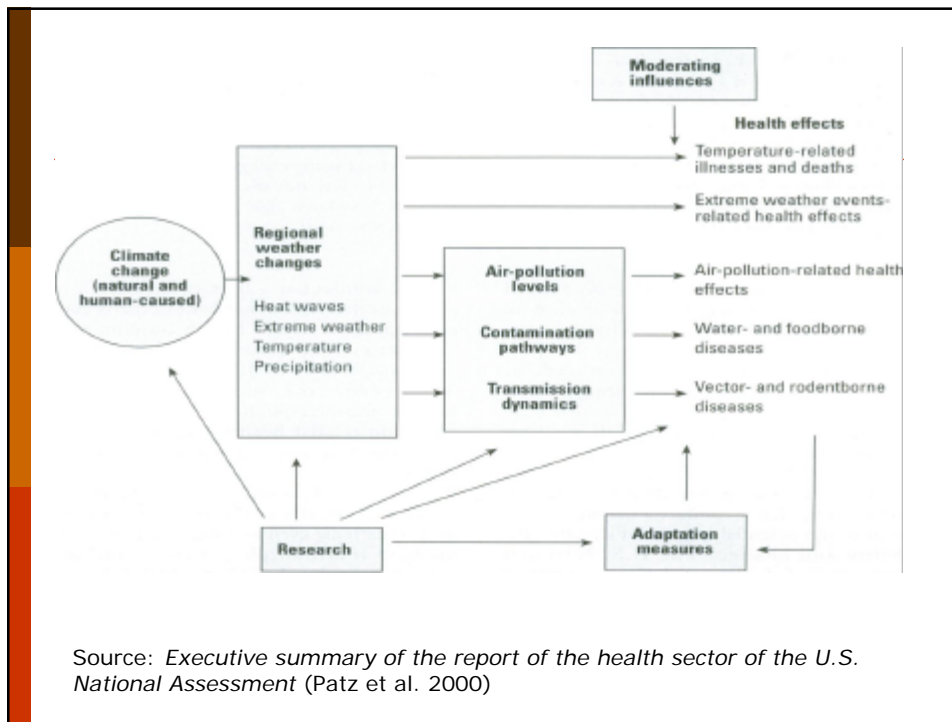
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Review of the literature, identify relevant  
data & data gaps for WA State perspective

Qualitative assessment

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Quantitative assessment



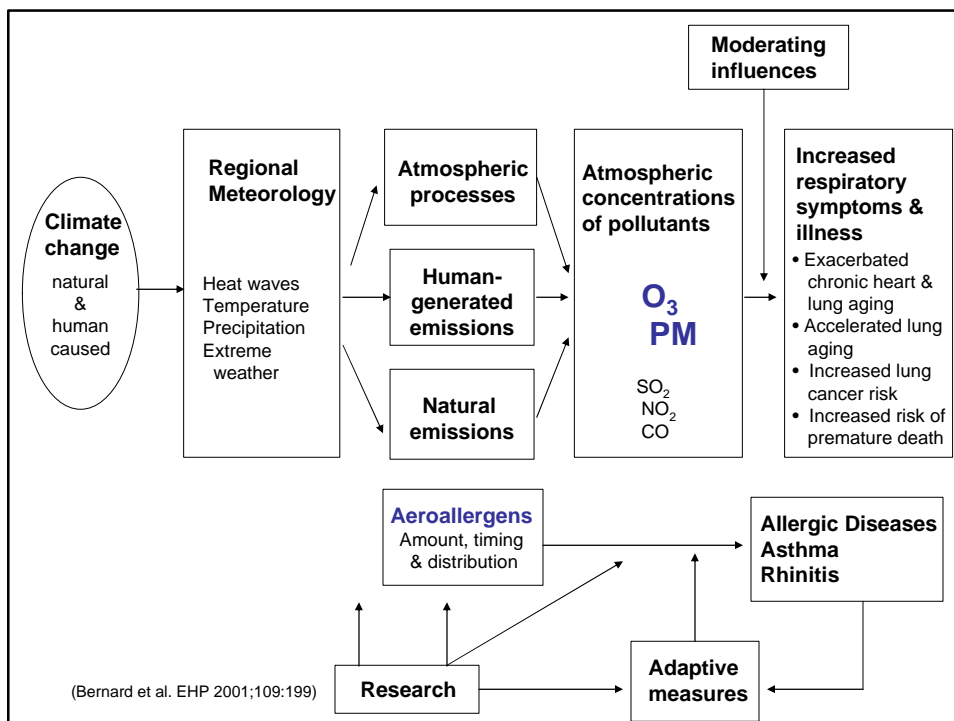
## Human Health Impact Areas

- ❑ Heat/Thermal Stress
- ☑ Degradation of Air Quality
  - ❑ Infectious Disease (food- and waterborne + vector borne disease)
  - ❑ Extreme Weather Events: storms, coastal erosion, flooding
  - ❑ Social Disruption, Stress and Economic Disparities

# Climate Change & Air Quality

The influence of meteorology on air quality is substantial and well-established

Climate change assessments include air quality effects as key consideration



## Regional Meteorology

UW Climate Impacts Group, 2007:

? 2.1 - 2.3°F by 2020s

? 3.0 - 4.1°F by 2040s

? 4.9 - 7.1°F by 2080s

## CIg projections & air pollutants

Expect increases in:

PM<sub>2.5</sub>

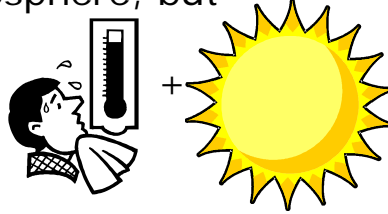
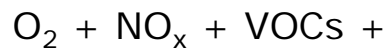
Ozone

Pollen

## Meteorology & Air Pollution: ? temperature ? ?ozone

Form of oxygen – O<sub>3</sub>

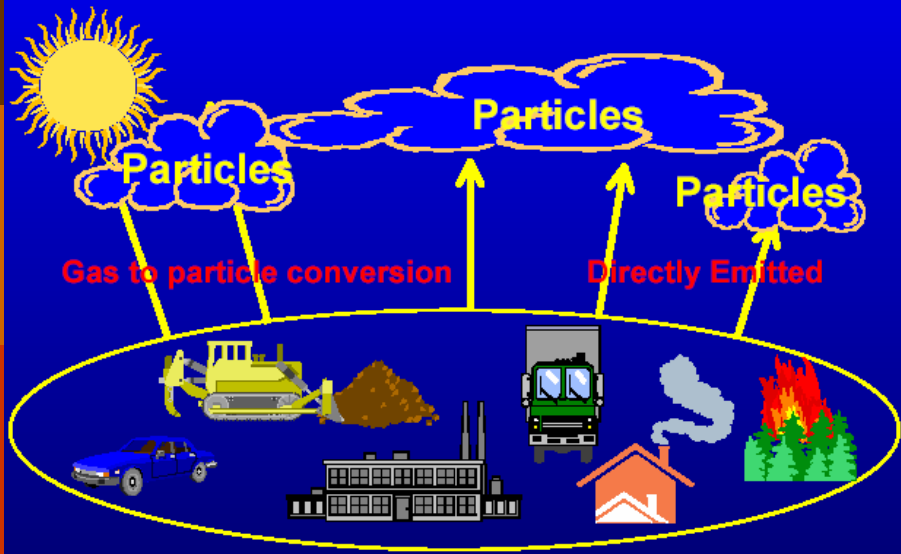
Not emitted into the atmosphere, but  
created there:



→ Ozone (O<sub>3</sub>)

(? evaporative VOCs from fuel injected  
autos with ? temperature)

## WHERE DO PARTICLES COME FROM?



## Meteorology & PM<sub>2.5</sub>

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Higher temperatures in PNW would likely increase the frequency of favorable conditions for wildfires, a source of PM<sub>2.5</sub> pollution (McKenzie et al., 2004; Littell 2006)

## Meteorology & Pollen

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There is growing evidence that elevated temperatures contribute to a longer pollen season and increased allergenicity of some pollens (Beggs, 2004)

## Health effects of O<sub>3</sub> and PM<sub>2.5</sub>

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- Exacerbation of asthma and chronic obstructive pulmonary disease (COPD)
- New onset asthma?
- Low birth weight/prematurity in newborns
- Respiratory infections
- Lung cancer
- Cardiovascular disease
- Higher rates of infant mortality and premature death in adults

## Pollen & health

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Allergic diseases affected by pollen have increased over the last several decades

- Asthma
- Seasonal allergic rhinitis (allergies)
- Co-exposures to allergens (pollens) and other air pollutants may raise the risk of developing the disease *and* increase severity of allergic response (Wyler, 2000)

Does climate change to date explain some of this increase???

(Beggs, 2005)

## WA State Perspective

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Air pollution-related illnesses are already important public health concerns in WA

- Heart disease is leading cause of death in those over 65 (WA DoH Data Book, 2005)
- Prematurity and low birth weight are leading causes of infant mortality (WA DoH Data Book, 2005)
- WA asthma rate among highest in the US (WA DoH Asthma Program, 2007)
- Vulnerable groups include children and infants, the elderly, the poor, and those who work or exercise outdoors

## Public Health stakes of climate change response: Losing ground...or gaining speed

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- Overall, ambient air concentrations of ozone and particulate matter have improved in the last decades due to control of emissions
- If no response to mitigate: will climate change compromise this progress?
- Or will action to address climate change deliver added value of improved air quality for WA state?

Thank you

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