

# Climate and Health The Northwest Context

National Climate Assessment  
Northwest Regional Health Sector Workshop  
February 2012



Howard Frumkin, M.D., Dr.P.H., Dean  
University of Washington  
School of Public Health



# Agenda

1. Some more Northwest context
2. A neglected climate hazard

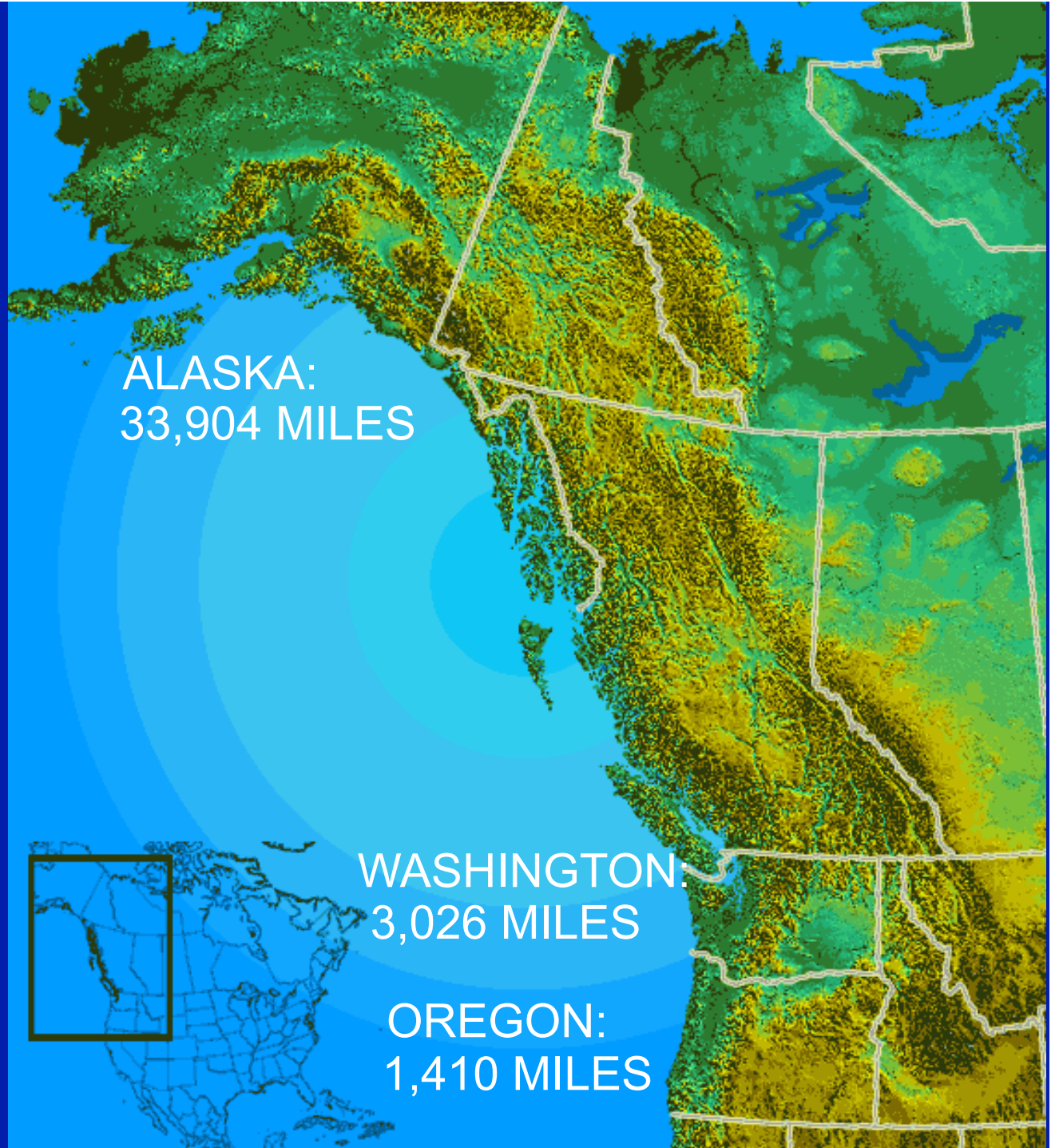
HOW MUCH  
COASTLINE IN  
THE PNW?



ALASKA:  
33,904 MILES

WASHINGTON:  
3,026 MILES

OREGON:  
1,410 MILES



# The Cascadia bioregion



<http://www.sightline.org/>

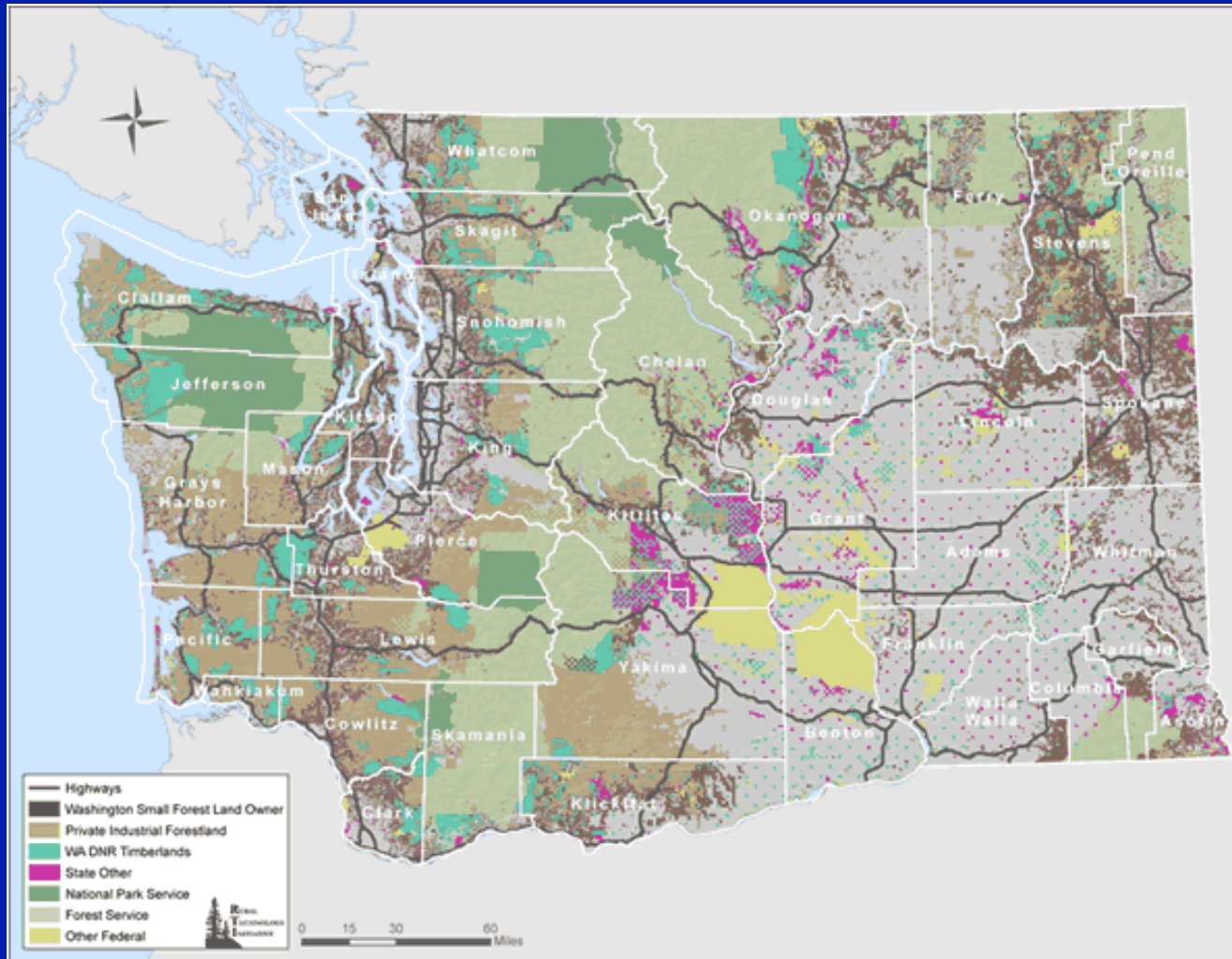


# The Columbia River basin

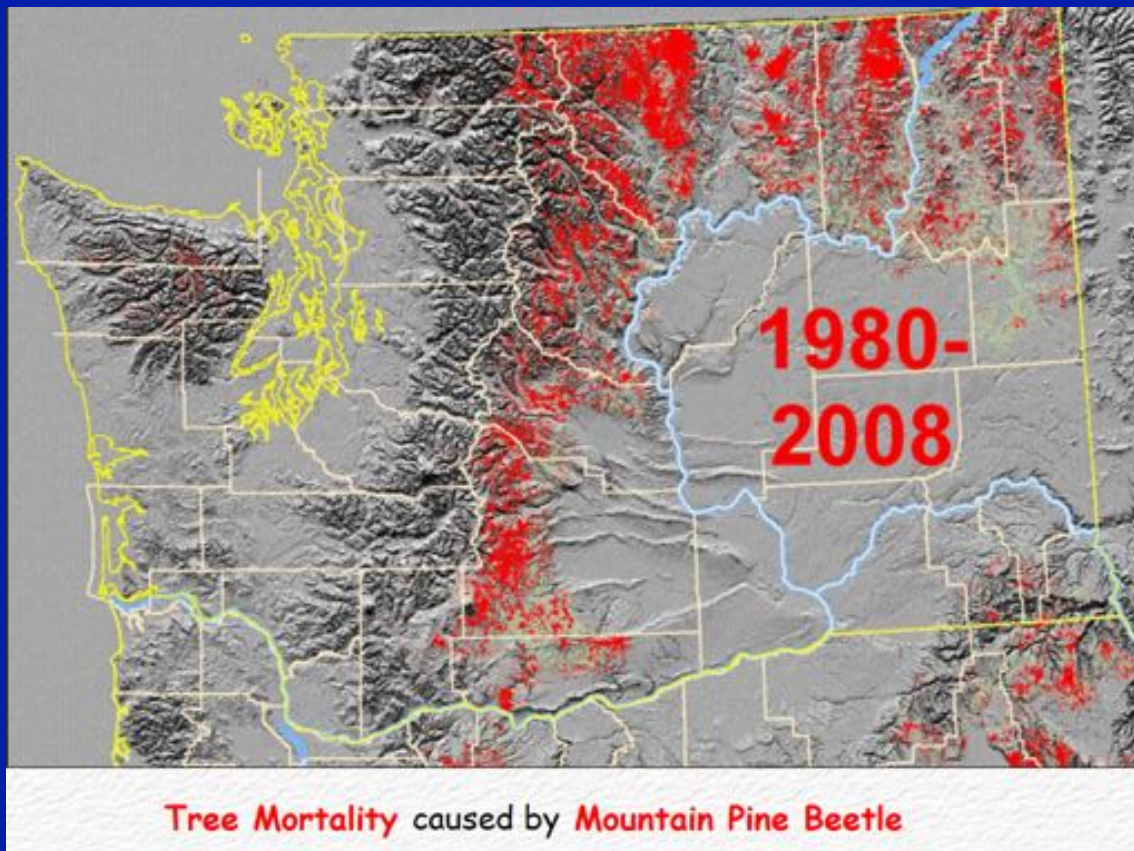


<http://www.nwd-wc.usace.army.mil/report/colmap.htm>

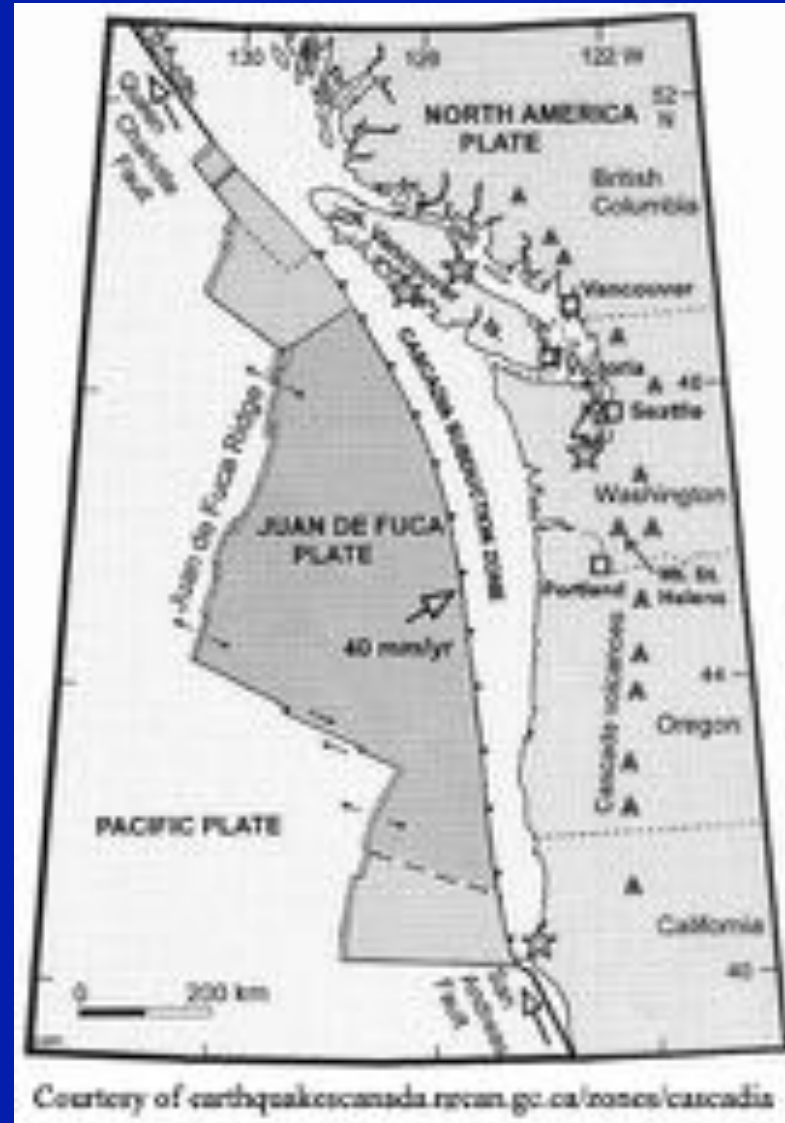
# Forest cover in Washington



Source: Washington State University, Rural Technology Institute. [http://www.ruraltech.org/projects/wrl/fldb/2009\\_report/appendix\\_e.asp](http://www.ruraltech.org/projects/wrl/fldb/2009_report/appendix_e.asp)



# A seismic zone







	Population (millions)
WA	6.8
OR	3.9
ID	1.6

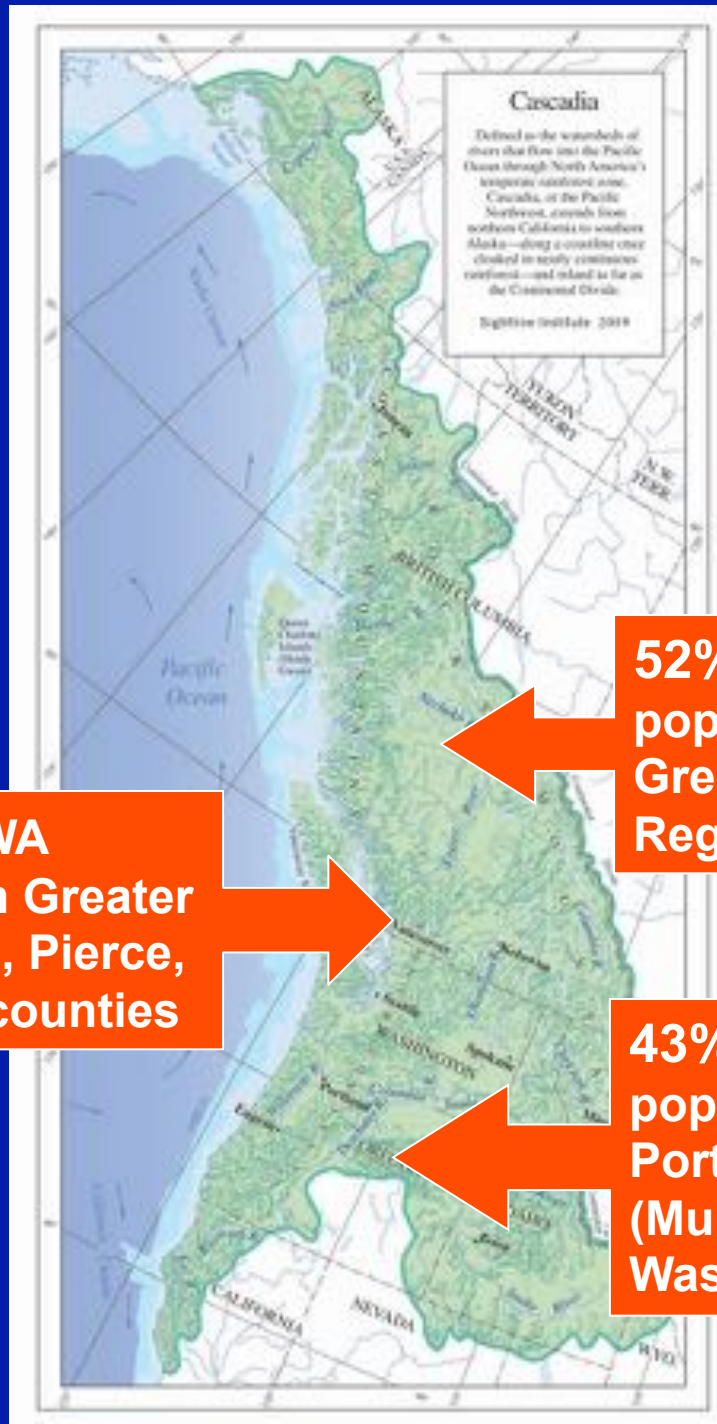


	Population (millions)
WA	6.8
OR	3.9
ID	1.6
AK	0.7



	Population (millions)
WA	6.8
OR	3.9
ID	1.6
AK	0.7
N. CA	14.6

# Urbanization in Cascadia



# Washington economy

- International trade (4<sup>th</sup> largest exporting state)
- Aerospace (Boeing)
- Software (Microsoft)
- Forest products (Weyerhaeuser, others)
- Retail (Amazon, Costco, Nordstroms; Starbucks)
- Electronics
- Biotech
- Fish
- Agriculture (leading producer of apples, cherries, hops, lentils, potatoes, barley, wheat)

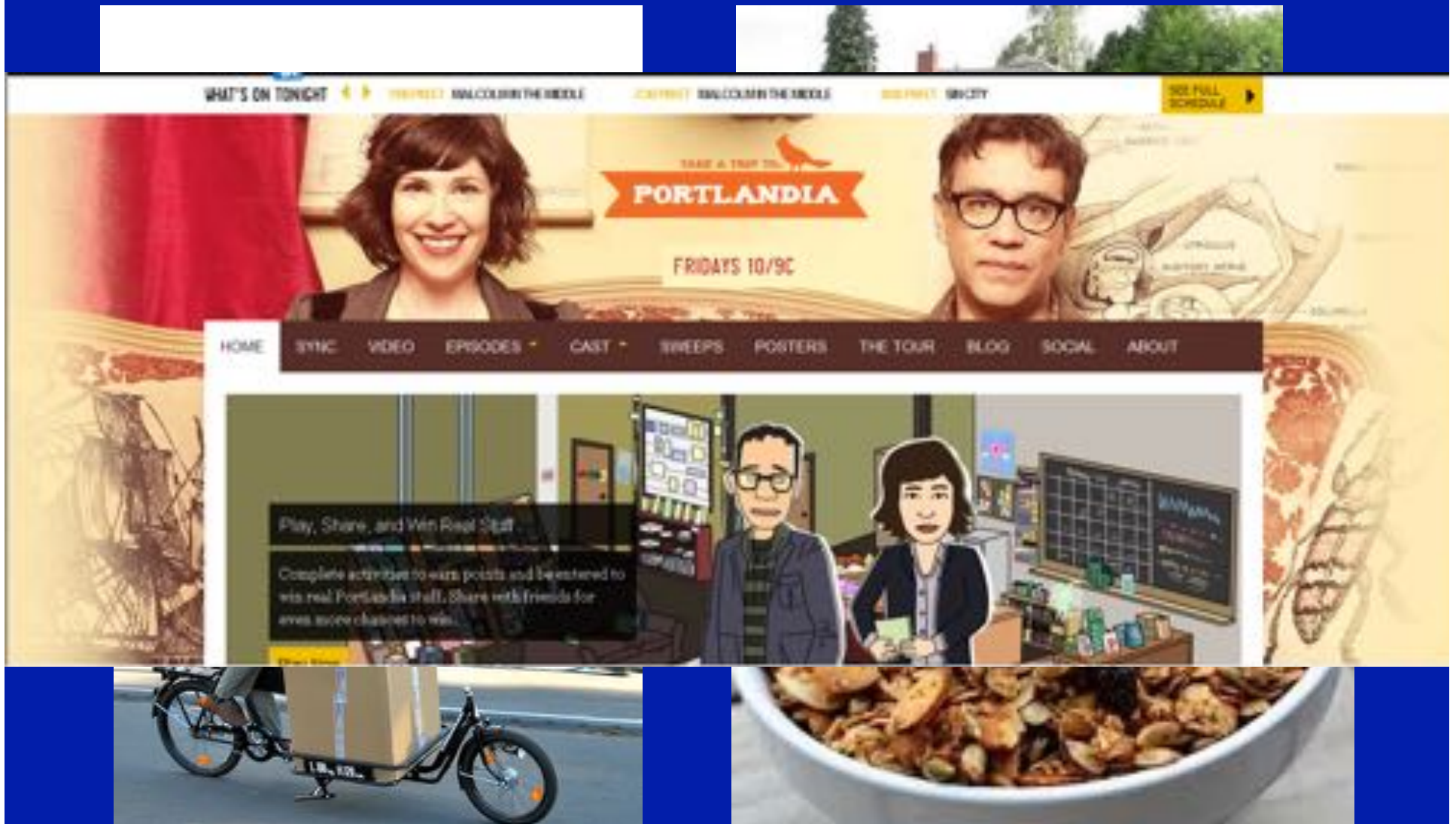
# Oregon economy

- Forest products
- Agriculture and food processing
- Electronics (Intel)
- Footwear (Nike)
- Tourism

# Idaho economy

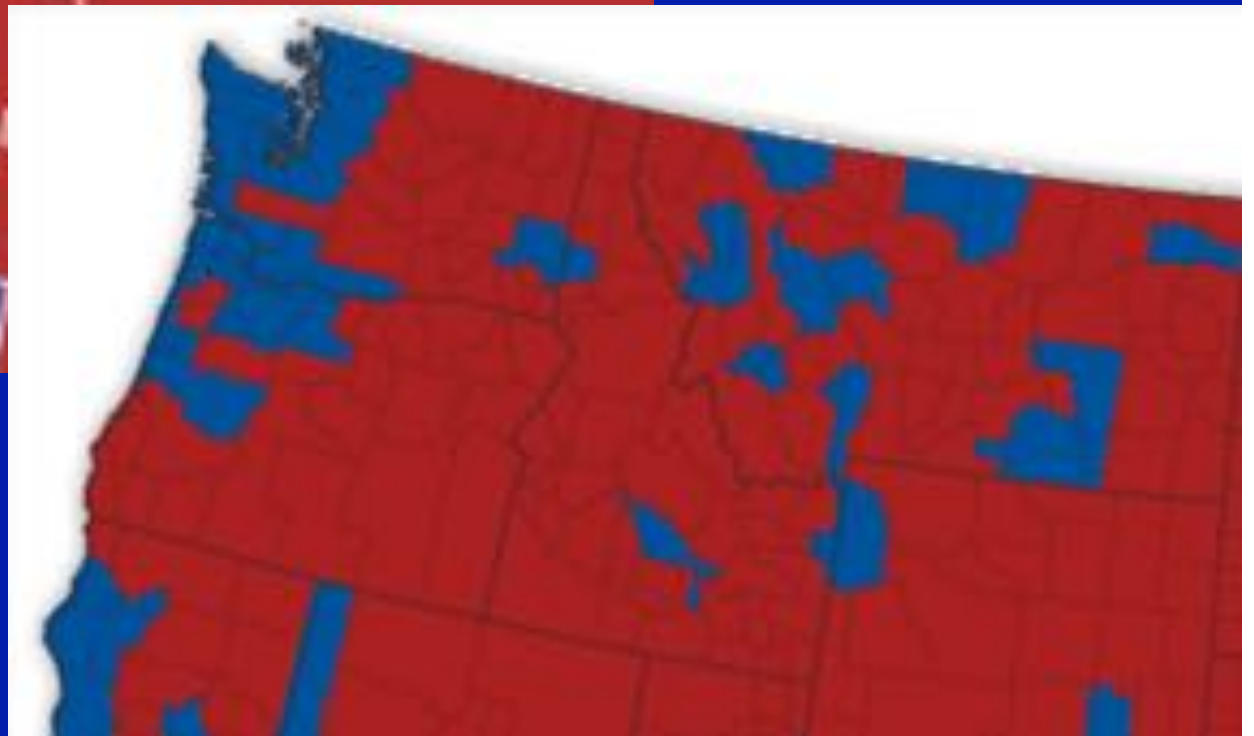
- Agriculture (1/3 US potatoes; wheat)
- Food processing
- High tech manufacturing
- Tourism

# Culture





# Politics in the northwest: The 2008 presidential election



# Electricity generation in the Northwest

	Coal	Oil	Gas	Hydro	Nuclear	Other
<b>WA</b>	9.1%	-	8.6%	66.0%	8.3%	7.5%
<b>OR</b>	7.8%	-	26.4%	55.3%	-	10.4%
<b>ID</b>	0.0%	-	16.7%	63.7%	-	19.1%
<b>AK</b>	9.1%	14.5%	55.2%	20.8%	-	-

Hell's  
Canyon,  
ID  
391 MW

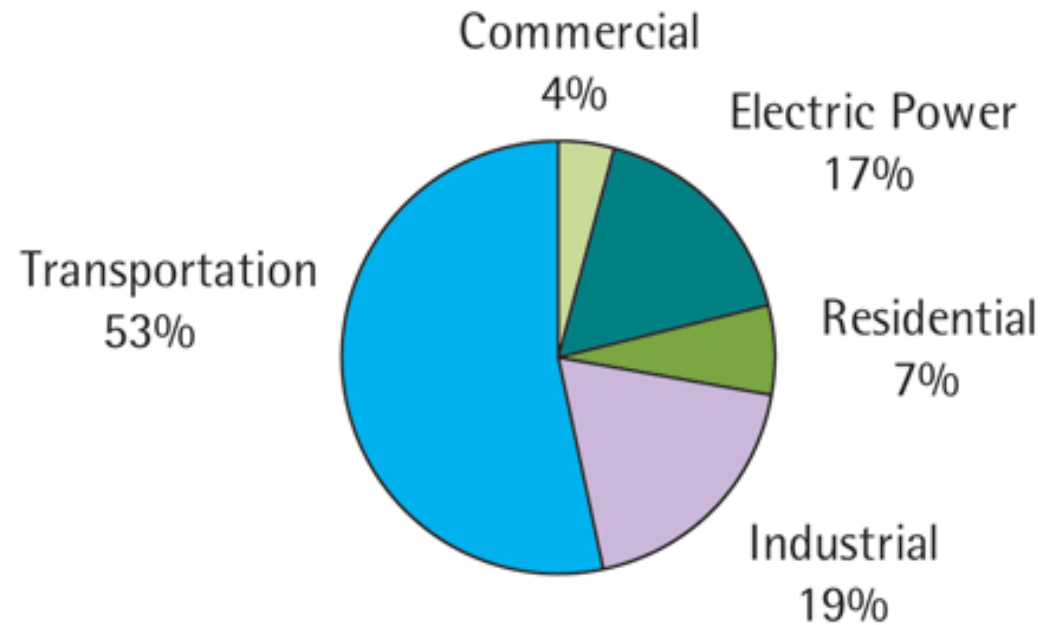


Grand  
Coulee,  
WA  
6809 MW



Source: Energy Information Administration. <http://205.254.135.7/state/> (2011 data)

# CO<sub>2</sub> emissions by sector in the Northwest



CO<sub>2</sub> emissions from fossil fuels in the Northwest (ID, OR, WA)

Total: 133 million metric tons

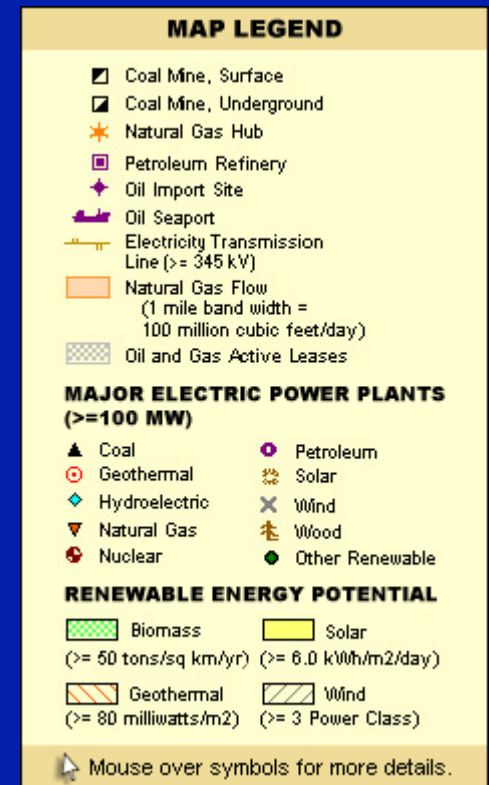
# Enormous renewable energy potential



Biomass, geothermal, wind



Geothermal, wind

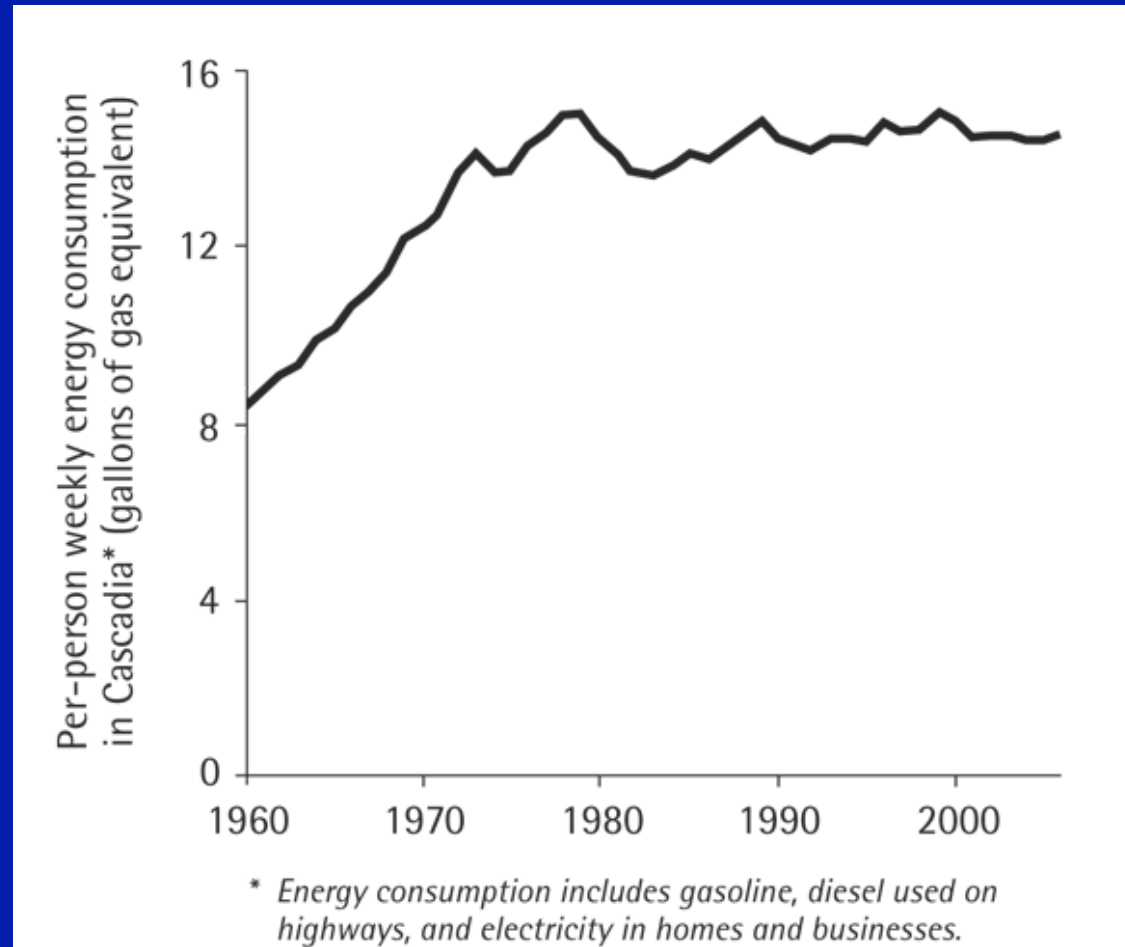


# Per capita energy consumption in the Northwest

	Per capita consumption (million Btu)	Rank among US states
AK	907	2
ID	330	22
WA	305	26
OR	279	35

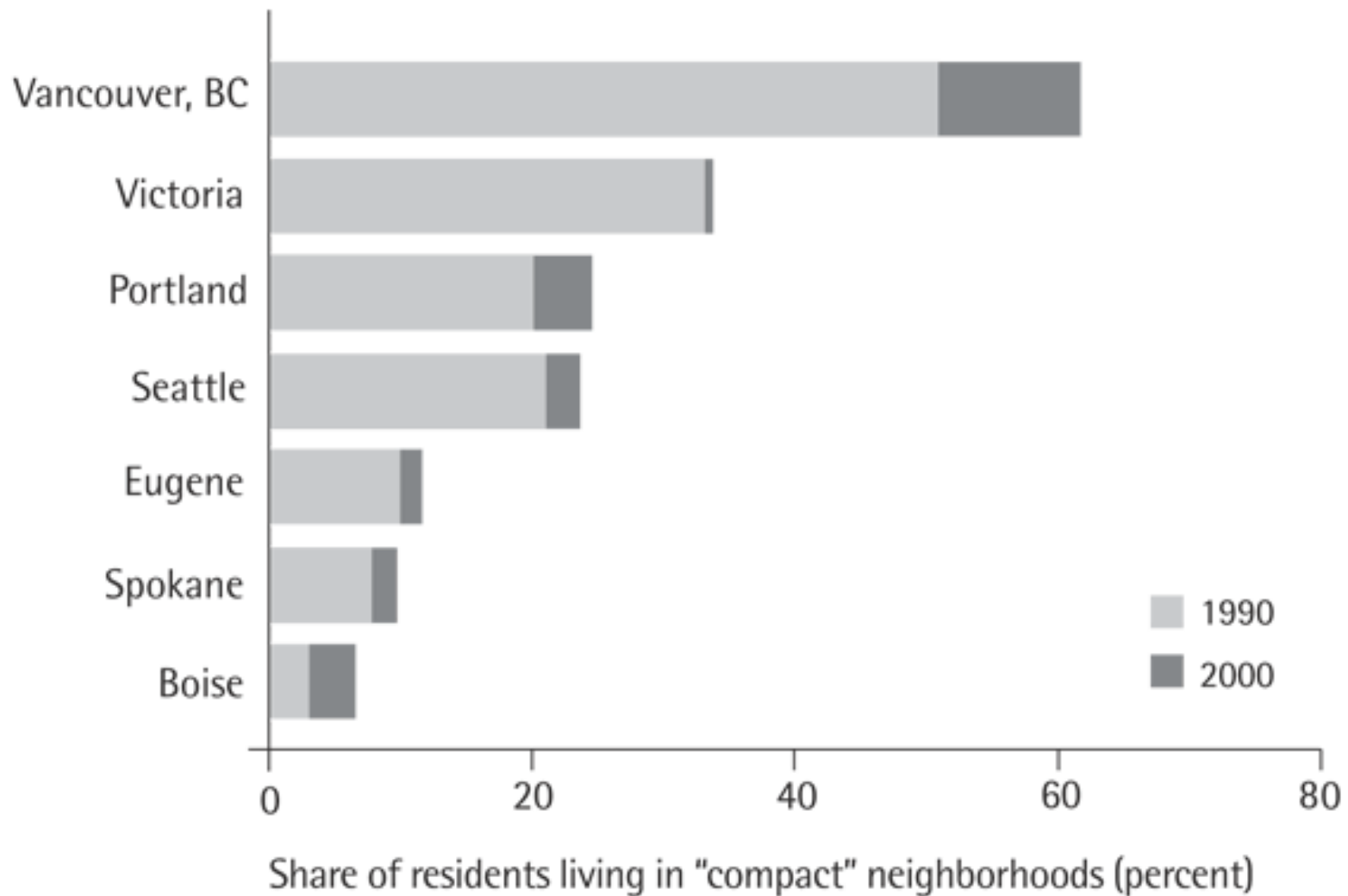
Source: Energy Information Administration. <http://205.254.135.7/state/>

# Per capita energy consumption, Cascadia, 1960-2006



Source: Sightline Institute <http://www.sightline.org/maps/charts/Energy-WeeklyUse-CS07>

# Increasing urban density



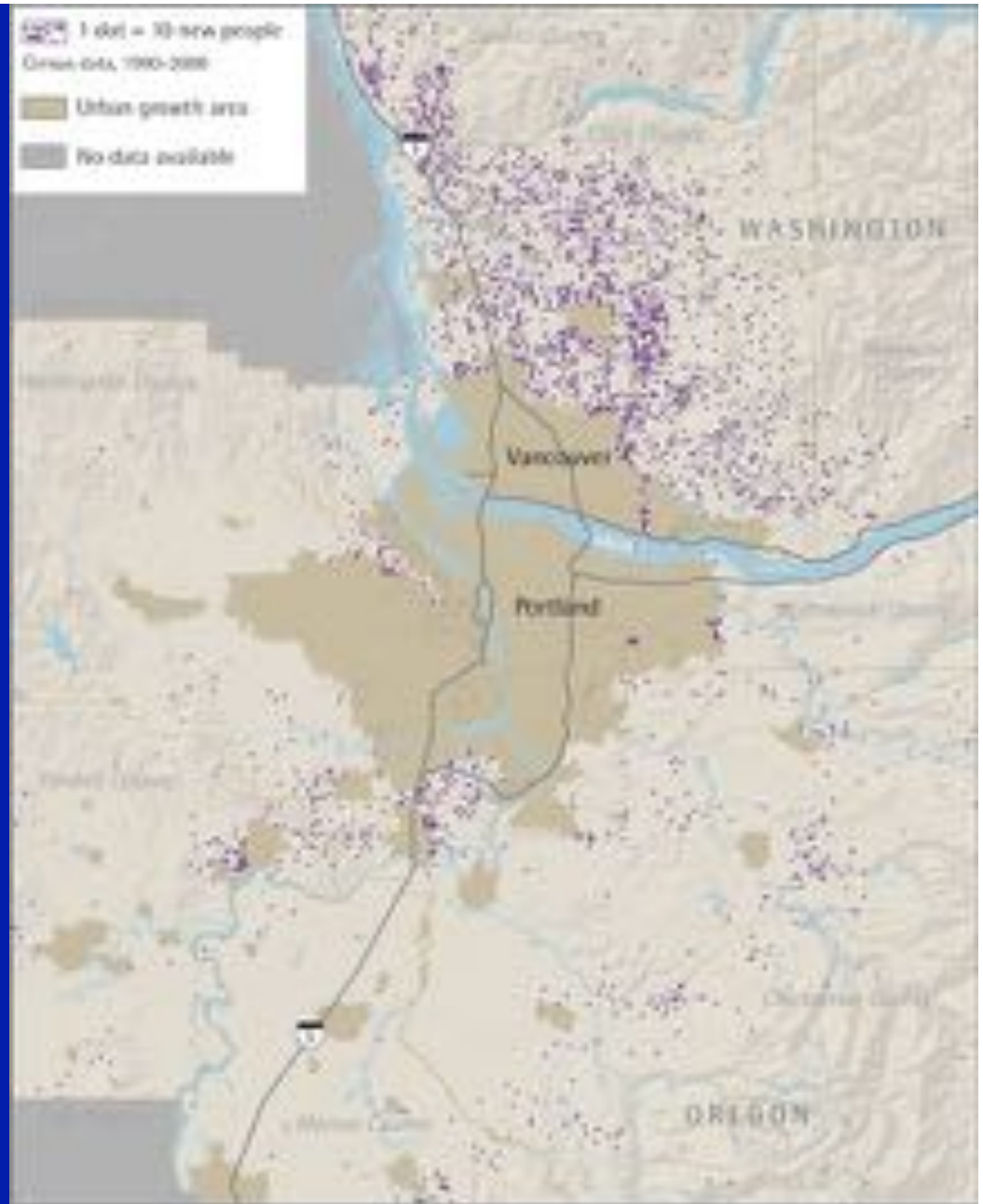
# Portland: Sprawl followed by an urban growth boundary



Source: Sightline Institute. [http://www.sightline.org/maps/animated\\_maps/portland\\_historic\\_gif](http://www.sightline.org/maps/animated_maps/portland_historic_gif)



# Peri-urban growth, 1990-2000 Portland vs Vancouver WA



Source: Sightline Institute <http://www.sightline.org/maps/maps/Sprawl-ClarkCo-CS07m/medium>

# Regional climate preparedness



## The Washington Climate Change Impacts Assessment

Evaluating Washington's Future in a Changing Climate



The Climate Change Impacts Assessment

## The Oregon Climate Change Adaptation Framework

December 2010



## Montana Climate Change Action Plan

Final Report of the Governor's Climate Change Advisory Committee

November 2007



## Alaska Climate Change Adaptation Planning Tool

*"The future ain't what it used to be."—Yogi Berra*

It's no joke. Alaska is changing before our eyes.

- Spring is coming earlier and freeze-up later.
- Sea ice is disappearing from the Arctic.
- Permafrost is thawing in places where it never did before.
- Severe storms and floods are occurring more frequently.

What's more, scientists who study Alaska's lands, oceans and atmosphere predict even greater changes between now and the end of this century.

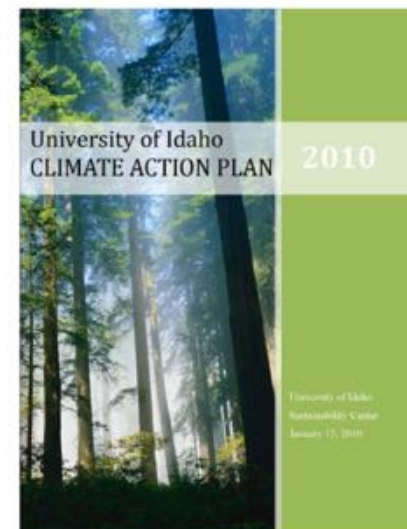
Not all change is harmful, and some may be beneficial. Milder winters may lower heating costs, agriculture may prosper, and useful stocks of fish or wildlife may become established in your area. But many changes are already causing problems and indications are that in the long term, life in Alaska will be very different from what it is now.

### About this Adaptation Planning Tool

This adaptation tool can help you and your community think about ways to adapt to changes you are already experiencing or that you expect in the future. It will help you identify impacts environmental changes may have on your community ("assess vulnerabilities"), devise strategies for coping with these changes, and locate resources to help. It consists of eight steps to help you create your own adaptation plan.

To create your plan, read through this document and then, using it as a guide, fill in your answers using the "Adaptation Plan for this Community" template file, a Microsoft Word document with your own answers. Adapting to Climate Change in Coastal Alaska.

Through efforts to cut emissions of greenhouse gases, the effects of climate change will be less severe. Meanwhile, you can begin to adapt to climate change in your family and community. Adaptation measures could actually save lives.



## University of Idaho CLIMATE ACTION PLAN

2010

University of Idaho Sustainability Center January 13, 2010

# Climate change in the Northwest: Resiliency

- Low dependence on fossil fuels
- Potential for alternative energy
- Diversified economy
- Advanced urban areas
- Political will to address the problem
- Cultural orientation to sustainability
- Initial planning steps taken



# Climate change in the Northwest: Vulnerability

- Projected ↑ temperatures, ↑ extreme severe precipitation W of Cascades, ↓ Cascade snowpack
- Importance of forestry and agriculture
- Extensive forest drying
- Extensive exposed coastlines
- Reliance on mountain snowmelt for water (and electricity)
- Political opposition to addressing the problem



# A neglected hazard: Irrelevance



What if all our scientific consideration of climate and health is beside the point?

## Top Policy Priorities for 2012

% considering each as a "top priority" for the president and Congress this year	Five years ago	One year ago	Today	Five year chg
	Jan 2007	Jan 2011	Jan 2012	
Economy	68	87	86	+18
Jobs	57	84	82	+25
Terrorism	80	73	69	-11
Budget deficit	53	64	69	+16
Social Security	64	66	68	
Education	69	66	65	
Medicare	63	61	61	
Tax fairness	--	--	61	
Health care costs	68	61	60	-8
Energy	57	50	52	
Help poor and needy	55	52	52	
Crime	62	44	48	-14
Moral breakdown	47	43	44	
Environment	57	40	43	-14
Lobbyist influence	35	37	40	
Illegal immigration	55	46	39	-16
Strengthening military	46	43	39	-7
Global trade	34	34	38	
Transportation	--	33	30	
Lower military spending	--	--	29	
Campaign finance	24*	--	28	
Global warming	38	26	25	-13

PEW RESEARCH CENTER, Jan. 11-16, 2012.  
 \* Campaign finance reform trend from Jan. 2004.

# Public priorities

Pew Research Center for the People and the Press. Public Priorities: Deficit Rising, Terrorism Slipping . January 23, 2012. <http://www.people-press.org/2012/01/23/public-priorities-deficit-rising-terrorism-slipping/>

# Public opinion on climate change

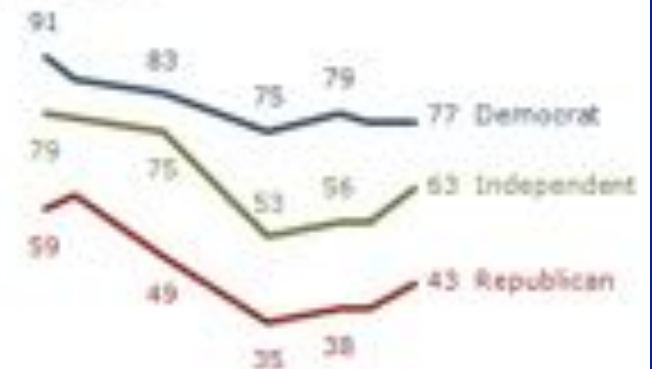
## Opinions About Global Warming: 2006-2011

	2006	2007	2008	2009	2010	2011
<b>Is there solid evidence the earth is warming?</b>	%	%	%	%	%	%
Yes	77	77	71	57	59	63
Because of human activity	47	47	47	36	34	38
Because of natural patterns	20	20	18	16	18	18
Don't know	10	10	6	6	6	6
No	17	16	21	33	32	28
Mixed evidence/Don't know	<u>6</u>	<u>7</u>	<u>8</u>	<u>10</u>	<u>9</u>	<u>9</u>
	100	100	100	100	100	100
<b>How serious a problem is global warming?</b>						
Very serious	43	45	44	35	32	38
Somewhat serious	36	32	29	30	31	27
Not too serious	11	12	13	15	16	16
Not a problem	9	8	11	17	18	17
Don't know	<u>1</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>2</u>
	100	100	100	100	100	100

PEW RESEARCH CENTER Nov. 9-14, 2011. Figures may not add to 100% because of rounding.

## Solid Evidence of Global Warming?

% saying yes



2006 2009 2011

PEW RESEARCH CENTER Nov. 9-14, 2011. Q63.

Source: Pew Research Center for the People and the Press.  
December 2011. <http://www.people-press.org/2011/12/01/modest-rise-in-number-saying-there-is-solid-evidence-of-global-warming/>

# Public priorities on the environment

## *Degree to Which Americans Worry About Environmental Problems*

I'm going to read you a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all.

	<b>Great deal/ Fair amount</b>	<b>Not much/ Not at all</b>
	%	%
Contamination of soil and water by toxic waste	79	20
Pollution of rivers, lakes, and reservoirs	79	22
Pollution of drinking water	77	23
Maintenance of the nation's supply of fresh water for household needs	75	24
Air pollution	72	28
Extinction of plant and animal species	64	36
The loss of tropical rain forests	63	35
Urban sprawl and loss of open spaces	57	42
Global warming	51	48

March 3-6, 2011

Gallup. Water Issues Worry Americans Most, Global Warming Least. March 2011. <http://www.gallup.com/poll/146810/Water-Issues-Worry-Americans-Global-Warming-Least.aspx>



# Public perception of climate change

Analysis of 74 surveys over a 9-year period

Climatic Change  
DOI 10.1007/s10584-012-0403-y

**Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the U.S., 2002–2010**

Robert J. Brulle • Jason Carmichael • J. Craig Jenkins

Received: 22 September 2011 / Accepted: 13 January 2012  
© Springer Science+Business Media B.V. 2012

**Abstract** This paper conducts an empirical analysis of the factors affecting U.S. public concern about the threat of climate change between January 2002 and December 2010. Utilizing Stimson's method of constructing aggregate opinion measures, data from 74 separate surveys over a 9-year period are used to construct quarterly measures of public concern over global climate change. We examine five factors that should account for changes in levels of concern: 1) extreme weather events, 2) public access to accurate scientific information, 3) media coverage, 4) elite cues, and 5) movement/countermovement advocacy. A time-series analysis indicates that elite cues and structural economic factors have the largest effect on the level of public concern about climate change. While media coverage exerts an important influence, this coverage is itself largely a function of elite cues and economic factors. Weather extremes have no effect on aggregate public opinion.

Major determinants of public opinion:

- Elite cues
- Structural economic factors

Little or no effect:

- Providing scientific information to the public

# Public perception of climate change

## Public Understanding of Climate Change in the United States

Elke U. Weber *Columbia University*  
Paul C. Stern *National Research Council*

*This article considers scientific and public understandings of climate change and addresses the following question: Why is it that while scientific evidence has accumulated to document global climate change and scientific opinion has solidified about its existence and causes, U.S. public opinion has become more polarized? Our constructivist account of human understanding is affected by the incommensurable modes of understanding climate change, the usual modes of understanding climate change, and the ways in which psychology can shape the frames and meanings that we use to understand the phenomena. We discuss ways in which psychology can improve understanding of climate change and understanding of climate change leading to action.*

**Keywords:** risk perception, climate change, mental models, expert-novice

Climate change is the physical phenomena and sometimes also referred to as global warming. This article describes

Research Board, 1979, p. vii). In 1987, Congress passed the Global Climate Protection Act and directed the Environmental Protection Agency to propose to Congress a coordinated national policy on global climate change and the Secretary of State to coordinate diplomatic ef-

## The Dragons of Inaction Psychological Barriers That Limit Climate Change Mitigation and Adaptation

Robert Gifford  
*University of Victoria*

*Most people think climate change and sustainability are important problems, but too few global citizens engaged in high-greenhouse-gas-emitting behavior are engaged in enough mitigating behavior to stem the increasing flow of greenhouse gases and other environmental problems. Why is that? Structural barriers such as a climate-averse infrastructure are part of the answer, but psychological barriers also impede behavioral choices that would facilitate mitigation, adaptation, and environmental sustainability. Although many individuals are engaged in some ameliorative action, most could do more, but they are hindered by seven categories of psychological barriers, or "dragons of inaction": limited cognition about the problem, ideological worldviews that tend to preclude pro-environmental attitudes and behavior, comparisons with key other people, sunk costs and behavioral momentum, discredence toward experts and authorities, perceived risks of change, and*

*In some cases, structural and therefore behavioral control. For example, everyone who is not living in a region with public transport does not reduce home-heating energy use. What limits more widespread adoption of more pro-environmental actions on energy use are feasible?*

**Keywords:** climate change, psychological impacts, disaster

## The Psychological Impacts of Global Climate Change

Thomas J. Doherty *Lewis & Clark Graduate School of Education and Counseling*  
Susan Clayton *College of Wooster*

*An appreciation of the psychological impacts of global climate change entails recognizing the complexity and multiple meanings associated with climate change; situating impacts within other social, technological, and ecological transitions; and recognizing mediators and moderators of impacts. This article describes three classes of psychological impacts: direct (e.g., acute or traumatic effects of extreme weather events and a changed environment); indirect (e.g., threats to emotional well-being based on observation of impacts and concern or uncertainty about future risks); and psychosocial (e.g., chronic social and community effects of heat, drought, migrations, and climate-related conflicts, and postdisaster adjustment). Responses include providing psychological interventions in the wake of acute impacts and reducing the vulnerabilities contributing to their severity; promoting emotional resiliency and empowerment in the context of indirect impacts; and acting at systems and policy levels to address broad psychosocial impacts. The challenge of climate change calls for increased ecological literacy, a widened ethical responsibility, investigations into a range of psychological and social adaptations, and an allocation of resources and training to improve psychologists' competency in addressing climate change-related impacts.*

**Keywords:** climate change, psychological impacts, disaster

ena, such as increased population, urbanization, and disparities in wealth (Kazdin, 2009, p. 342; Stokols, Misra, Runnerstrom, & Hipp, 2009). The concept of climate change assumes a progression of extreme weather and environmental changes at an unprecedented rate and scale. It is important to recognize that the severity of impacts is due not solely to extreme weather or other natural events following from global climate change but rather to the interaction between human systems and these events (see National Research Council, 2008). For example, psychological impacts are likely to be mediated and moderated by media representations and information technologies (Reser, 2010), resilience or vulnerability to disasters and environmental changes (Brklacich, Chazan, & Dawe, 2007), and social and cognitive factors (Leiserowitz, 2007; Weber, 2006).

This article differentiates three classes of climate change-related psychological impacts, offers examples, and discusses interrelated psychological processes and contextual factors (see Figure 1 for an overview). Acute and direct impacts include mental health injuries associated with more frequent and powerful weather events, natural disasters, and adjustment to degraded or disrupted physical environments (Albrecht et al., 2007; Costello et al., 2009; Few, 2007; Page & Howard, 2010). Indirect and vicarious

# Psychological barriers

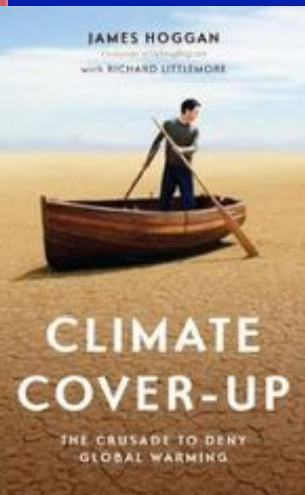
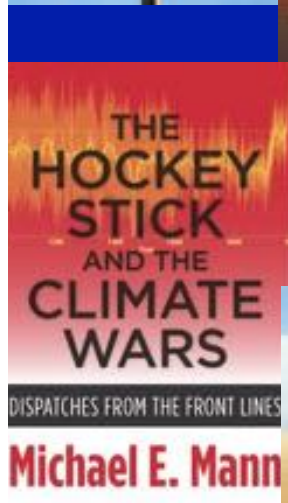
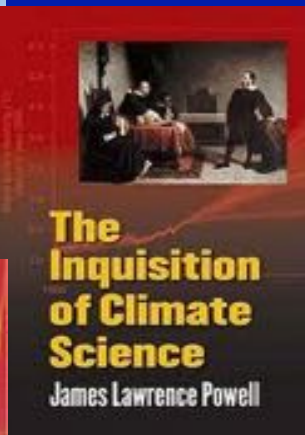
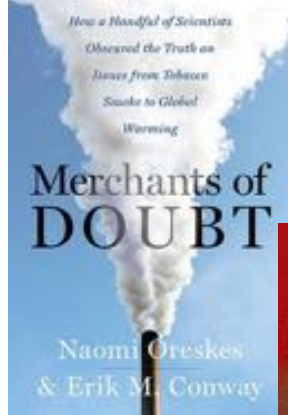
- Climate change is unprecedented
- Climate change is complicated
- People discount risks
- Daily experience doesn't confirm climate change
- Climate change is frightening
- Climate change has been hitched to ideology
- People mistrust information sources and authorities
- People don't like the needed behavioral changes

# Undermining climate science

- Manufacturing uncertainty by raising doubts about even indisputable science
- Seemingly independent front organizations
- Phony grass-roots voices
- Funding and promoting fringe scientist spokespersons
- Harassing climate scientists
- Equating climate action with financial ruin

## Smoke, Mirrors & Hot Air

How ExxonMobil Uses Big Tobacco's Tactics to Manufacture Uncertainty on Climate Science



## Climate of fear

The integrity of climate research has taken a very public battering in recent months. Scientists must now emphasize the science, while acknowledging that they are in a street fight.

Climate scientists are on the defensive, knocked off balance by a re-energized community of global-warming deniers who, by dominating the media agenda, are sowing doubts about the fundamental science. Most researchers find themselves completely out of their league in this kind of battle because it only superficially about the science. The real goal is to stoke the angry fires of talk radio, cable news, the blogosphere and the like, all of which feed off of contrarian story lines and seldom make the time to assess facts and weigh evidence. Civility, honesty, fact and perspective are irrelevant.

When the onslaught seems to be working, some polls in the United States and abroad suggest that it is eroding public confidence in climate science at a time when the fundamental understanding of the climate system, although far from complete, is stronger than ever. Ecologist Paul Ehrlich at Stanford University in California says that his climate colleagues are at a loss about how to counter the attacks. "Everyone is scared sh\*tless, but they don't know what to do," he says.

Researchers should not despair. For all the public's confusion about climate science, polls consistently show that people trust scientists more than almost anybody else to give honest advice. Yes, scientists' reputations have taken a hit thanks to headlines about the leaked climate e-mails at the University of East Anglia (UEA), UK, and an acknowledged mistake about the retreat of 20m-deep glaciers in a recent report from the Intergovernmental Panel on Climate Change (IPCC). But these wounds are not necessarily fatal.

To make sure they are not, scientists must acknowledge that they are in a street fight, and that their relationship with the media really matters. Anything strategic that can be done on that front would be useful, be it media training for scientists or building links with credible public-relations firms. In this light, there are lessons to be learned from the current spate of controversies. For example, the IPCC error was originally caught by scientists, not sceptics. Had it been properly corrected and openly explained to the media, in full context with the underlying science, the story would have lasted days, not weeks. The IPCC must establish a formal process for rapidly investigating and, when necessary, correcting such errors.

The unguarded exchanges in the UEA e-mails speak for themselves. Although the scientific process seems to have worked as it should have in the end, the e-mails do raise concerns about scientific behaviour and must be fully investigated. Public trust in scientists is based not just on their competence, but also on their perceived objectivity and openness. Researchers would be wise to remember this at all times, even when casually e-mailing colleagues.

US scientists recently learned this lesson yet again when a private e-mail discussion between leading climate researchers on how to deal with sceptics went live on conservative websites, leading to charges that the scientific elite was conspiring to silence climate sceptics (see page 140). The discussion was spurred by a report last month from

Senator James Inhofe (Republican, Oklahoma), the leading climate sceptic in the US Congress, who labelled several respected climate scientists as potential criminals — nonsense that was hardly a surprise considering the source. Some scientists have responded by calling for a unified public rebuttal to Inhofe, and they have a point. As a member of the minority party, Inhofe is powerless for now, but that may one day change. In the meantime, Inhofe's report is only as effective as the attention it receives, which is why scientists need to be careful about how they engage such critics.

**"Scientists must not be so naive as to assume that the data speak for themselves."**

The core science supporting anthropogenic global warming has not changed. This needs to be stated again and again, in as many contexts as possible. Scientists must not be so naive as to assume that the data speak for themselves. Nor should governments. Scientific agencies in the United States, Europe and beyond have been oddly silent over the recent controversies. In testimony on Capitol Hill last month, the head of the US Environmental Protection Agency, Lisa Jackson, offered at best a weak defence of the science while seeming to distance her agency's deliberations from a tarnished IPCC. Officials of her stature should be ready to defend scientists when necessary, and at all times give a credible explanation of the science.

These challenges are not new, and they won't go away any time soon. Even before the present controversies, climate legislation had hit a wall in the US Senate, where the poorly informed public debate often leaves one wondering whether science has any role at all. The IPCC's fourth assessment report had huge influence leading up to the climate conference in Copenhagen last year, but it was always clear that policy-makers were reluctant to commit to serious reductions in greenhouse-gas emissions. Scientists can't do much about that, but they can and must continue to inform policy-makers about the underlying science and the potential consequences of policy decisions — while making sure they are not tested in the court of public opinion. ■

## Scientific glasnost

Russia's scientific reputation will continue to dwindle unless it embraces international research.

Ever since the Soviet Union fell apart in 1991, Russian leaders have been vowing to transform their old-line, industrial society into a modern, knowledge-based economy driven by innovative science and technology. The current Russian president, Dmitry Medvedev, has repeated that ambition frequently — not least as a way to overcome Russia's dependence on oil and gas exports. Unfortunately that transformation continues to be hobbled by outdated attitudes at the top of Russia's academic hierarchy.

“Climate scientists are on the defensive, knocked off balance by a re-energized community of global-warming deniers who, by dominating the media agenda, are sowing doubts about the fundamental science. Most researchers find themselves completely out of their league in this kind of battle because it’s only superficially about the science. The real goal is to stoke the angry fires of talk radio, cable news, the blogosphere and the like, all of which feed off of contrarian story lines and seldom make the time to assess facts and weigh evidence. Civility, honesty, fact and perspective are irrelevant.”

# This week's events

The New York Times February 15, 2012

## In Documents, a Plan to Discredit Climate Teaching

By JUSTIN GELMAN and LESLIE KAUFMAN

Leaked documents suggest that an organization known for attacking climate science is planning a new push to undermine the teaching of global warming in public schools, the latest indication that climate change is becoming a part of the nation's culture wars.

The documents, from a nonprofit organization in Chicago called the Heartland Institute, outline plans to produce a curriculum that would cast doubt on the scientific finding that fossil fuel emissions endanger the long-term welfare of the planet. "Principals and teachers are already biased toward the alarmist perspective," the document said.

While the documents offer a rare glimpse of the internal thinking motivating the campaign against climate science, advocates of science education were preparing for battle even before the leak. Efforts to undermine climate-science instruction are beginning to spread across the country, they said, and they face a long fight similar to that over the teaching of evolution in public schools.

In a statement, the Heartland Institute acknowledged that some of its internal documents had been stolen. But it said its president had not had time to read the versions being circulated on the Internet on Tuesday and Wednesday and was therefore not in a position to say whether they had been altered.

Heartland did declare one two-page document to be a forgery, although its tone and content closely matched that of other documents that the group did not dispute. In an apparent confirmation that much of the material, more than 300 pages, was authentic, the group apologized to donors whose names became public as a result of the leak.

The documents included many details of the group's operations, including salaries, recent personnel moves and fund-raising plans and networks. They were sent by e-mail to leading climate scientists that week by someone using the name "Heartland leader" and were quickly reposted to many climate-related Web sites.

Heartland said the documents were not from an insider but were obtained by a "cable provider."

Steven Yaxson contributed reporting from Chicago.



A 2008 conference in Manhattan for climate change skeptics, sponsored by the Heartland Institute, a nonprofit group.

that have long favored action to combat climate change. The documents typically say that these donations were earmarked for projects unrelated to climate change, like publishing right-leaning newspapers on drug and technology policy. Nonetheless, several of the companies listed on Wednesday to disassociate themselves from the organization's climate stance.

"We absolutely do not endorse or support their views on the environment or climate change," said Sarah Alqasbi, a spokeswoman for GlaxoSmithKline, a multinational drug company that has contributed \$25,000 in the past two years to support a medical newsletter.

A spokesman for Microsoft, another listed donor, said that the company believes that "climate change is a serious issue that demands immediate worldwide action."

The documents raise questions about whether the group has violated the law governing nonprofit groups. For instance, the documents outline "Operation Angry Budgeter," a plan to spend \$62,000 to influence the outcome of recall elections and related fights this year in Wisconsin over the role of public-sector unions.

The lawyers said Wednesday that the exchange groups were allowed to undertake some types of lobbying and political education, but that because they are subsidized by taxpayers, they are prohibited from direct involvement in political campaigns.

The documents also show that the group has received money from some of the nation's largest corporations, including several

Charitable Foundation contributed \$25,000 last year and was expected to contribute \$200,000 this year. Mr. Koch is one of two brothers who have been prominent supporters of libertarian causes as well as other charitable endeavors. They control Koch Industries, one of the country's largest private companies and a major oil refiner.

The documents suggest that Heartland has spent several million dollars in the past five years in its efforts to undermine climate science, much of that coming from a person referred to repeatedly in the documents as "the Anonymous Donor." A growing group erupted Wednesday about who that might be.

The documents say that over the last year ending in 2011, the group expects to have spent more than \$1.4 million on financing the National Center for Science Education's National Policy on Climate Change, an effort that publishes periodic reports attacking climate science at public-level annual conferences. (Environmental groups that refer to the conference as "DenialWeek.")

Heartland's latest idea, the documents say, is a plan to create curriculum for public schools intended to cast doubt on mainstream climate science and budgeted at \$200,000 this year. The curriculum would claim, for instance, that "whether humans are changing the climate is a major scientific controversy."

It is in fact not a scientific controversy. The vast majority of climate scientists say that evidence generated by humans are changing the climate and putting the planet at long-term risk, although they are uncertain about the exact magnitude of that risk. Whether and how to rein in emissions of greenhouse gases has become a major political controversy in the United States, however.

The National Center for Science Education, a group that has had notable success in fighting for accurate teaching of evolution in the public schools, has recently added climate change to its agenda in response to pleas from teachers who say they need more water to teach the science.

Mark S. McCaffrey, programs and policy director of the group, which is in Oakland, Calif., said the Heartland documents revealed that "they continue to promote confusion, doubt and debate where there really is none."

### January 2012 Confidential Memo: 2012 Heartland Climate Strategy

Given the increasingly important role the Heartland Institute plays in preventing the implementation of dangerous policy action stemming, it is useful to set priorities for our efforts in 2012. I propose that at this point it be kept confidential. I will also name additional support from the Center for Science Education, they returned as a Heartland donor in 2011 with a contribution of \$200,000. I expect to push up their level of support in 2012 and gain access to their network of public officials, if our focus continues to align with their interests. Other contributions will be sought for this work, especially from corporations whose interests are threatened by climate policies.

### Increased climate project frustration

Our climate work is attractive to funders, especially in the area of education. Our contribution dropped from \$1,664,150 in 2010 to \$979,000 in 2011. We have promised an increase in 2012. Report. We will also pursue additional support from the Center for Science Education, they returned as a Heartland donor in 2011 with a contribution of \$200,000. I expect to push up their level of support in 2012 and gain access to their network of public officials, if our focus continues to align with their interests. Other contributions will be sought for this work, especially from corporations whose interests are threatened by climate policies.

### Development of our "Global Warming Curriculum for K-12 Classrooms"

Principals and teachers are heavily biased toward the alarmist perspective considering teaching an effort to develop alternative materials for K-12. I am pursuing a proposal from Dr. David Wojcik to produce a global warming curriculum. Dr. Wojcik is a consultant with the Office of Scientific and Technical Information, U.S. Department of Energy in the area of information and communication. I focus on providing curriculum that shows that the topic of climate change is uncertain - two key points that are effective at disarming teachers from tentatively plan to pay Dr. Wojcik \$100,000 for 20 modules in 2012, via the Anonymous Donor.

### Funding for parallel organizations

Heartland is part of a growing network of groups working the climate is support financially. We will seek additional partnerships in 2012. At present, we are supporting the official United Nations IPCC reports and paid \$288,000 in 2011 to work on a series of editions of Climate Change Risk. We will also seek to work on a series of editions of Climate Change Risk. We will also seek to work on a series of editions of Climate Change Risk. We will also seek to work on a series of editions of Climate Change Risk.

Heartland's latest idea, the documents say, is a plan to create curriculum for public schools intended to cast doubt on mainstream climate science and budgeted at \$200,000 this year. The curriculum would claim, for instance, that "whether humans are changing the climate is a major scientific controversy."

It is in fact not a scientific controversy. The vast majority of climate scientists say that evidence generated by humans are changing the climate and putting the planet at long-term risk, although they are uncertain about the exact magnitude of that risk. Whether and how to rein in emissions of greenhouse gases has become a major political controversy in the United States, however.

The National Center for Science Education, a group that has had notable success in fighting for accurate teaching of evolution in the public schools, has recently added climate change to its agenda in response to pleas from teachers who say they need more water to teach the science.

Mark S. McCaffrey, programs and policy director of the group, which is in Oakland, Calif., said the Heartland documents revealed that "they continue to promote confusion, doubt and debate where there really is none."

"...curriculum that shows that the topic of climate change is controversial and uncertain—two key points that are effective at dissuading teachers from teaching science..."

### Funding for selected individuals outside of Heartland

Our current budget includes funding for high-profile individuals who regularly and publicly opine the alarmist AGW message. At the moment, this funding goes primarily to Craig Idso (\$1,600 per month), Fred Singer (\$3,000 per month, plus expenses), Robert Carter (\$1,600 per month), and a number of other individuals, but we will consider expanding it, if funding can be found.

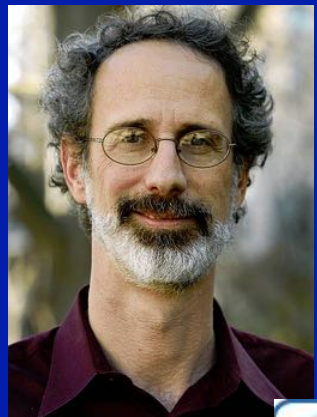
### Expanded climate communications

Heartland plays an important role in climate communications, especially through our in-house experts (e.g., Taryn) through his Forbes blog and related high profile outlets, our conferences, and through coordination with external networks (such as SCUEP) and other groups capable of rapidly mobilizing responses to new scientific findings, news stories, or unfavorable blog posts. Efforts at places such as Forbes are especially important now that they have begun to allow high-profile climate scientists (such as Ghilini) to post warmist science essays that create our own. This influential audience has usually been reliably anti-climate and it is important to keep opposing voices out. Efforts might also include cultivating more neutral voices with big audiences (such as Mark S. McCaffrey) who has a well-known anti-climate stance for some of the more extreme AGW commentators (such as James Hansen, Timmerman, and Hansen) or Cary (who has become popular with our supporters). We have also pledged to help raise around \$50,000 in 2012 for Anthony Watts to help him create a new website to track temperature station data.

Finally, we will consider expanding these efforts further, or developing new ones, if funding can be obtained.

"...coordination with external networks...and other groups capable of rapidly mobilizing responses to new scientific findings..."

The documents suggest that Heartland has spent several million dollars in the past five years in its efforts to undermine climate science..."



NOTE: Heartland Institute claims that this document is inauthentic.

# Politics and ideology undermine climate science



“There is no such thing as global warming.”  
-statement to Glenn Beck on Fox News, June 2011.

“It’s just an excuse for more government control of your life and I’ve never been for any scheme or even accepted the junk science behind the whole narrative.”  
–statement to Rush Limbaugh, June 2011.

“[Climate change is] an absolute travesty of scientific research that was motivated by those who, in my opinion, saw this as an opportunity to create a panic and a crisis for government to be able to step in and even more greatly control your life. ... I for one never bought the hoax.”  
-statement at Colorado political event, February 2012

# Politics and ideology undermine climate science



"I don't think that we have conclusive proof of global warming."

- 22 April 2008

<http://newt.org/tabid/193/articleType/ArticleView/ArticleId/3351/Default.aspx>

"Newt does not believe there is a settled scientific conclusion about whether industrial development has dramatically contributed to a warming of the atmosphere."

- February 2012

Newt.org (<http://www.newt.org/answers#GlobalWarming>)



# Politics and ideology undermine climate science



“Contrary to claims repeated over and over, there is no consensus in the scientific community that global warming is getting worse or that it is manmade. In fact over 30,000 scientists signed a petition recently directly disputing the claims on which this policy is based .... Meanwhile Washington bureaucrats have classified the very air we exhale as a pollutant and have gone unchallenged in this incredible assertion. The logical consequence is that there will come a time when we will have to buy a government permit just to emit carbon dioxide into the atmosphere from our own lungs!”

-Ron Paul, “Cap and trade will lead to capital flight,” 29 June 2009,

<http://www.campaignforliberty.com/article.php?view=124>

“The greatest hoax I think that has been around for many, many years if not hundreds of years has been this hoax on...global warming.”

-Ron Paul on Fox Business, Nov. 4 2009

# One (partial) exception



"I believe the world is getting warmer, and I believe that humans have contributed to that...It's important for us to reduce our emissions of pollutants and greenhouse gases that may be significant contributors."

- Mitt Romney at a campaign event, New Hampshire, June 3 2011

Source: <http://www.reuters.com/article/2011/06/03/us-campaign-romney-idUSTRE7525GM20110603>

# Climate change not a priority at US health agencies



## NIH priorities (2009)

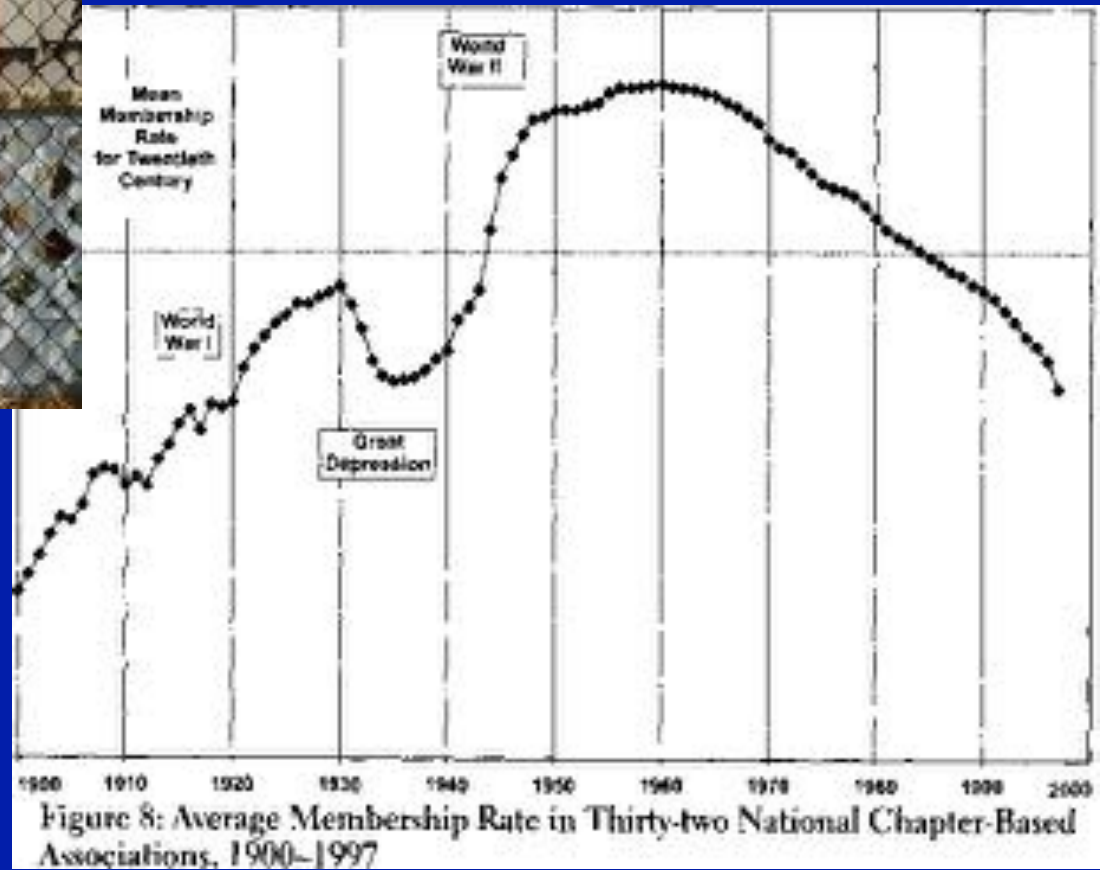
- High-throughput technologies
- Translational research
- Health care reform
- Global health
- Empowering the biomedical research community (sustained funding, encouraging young investigators, and innovative research)



## CDC “winnable battles”

- Food
- Global Immunization
- Healthcare-associated Infections
- HIV
- Lymphatic filariasis
- Maternal-child HIV & syphilis
- Motor vehicle injuries
- Nutrition, physical activity, obesity
- Teen pregnancy
- Tobacco

# Declining social capital



Source: Putnam, *Bowling Alone*

# Public Health agencies: Ready, willing, and unable

OPEN ACCESS Freely available online

PLoS one

## Climate Change and Local Public Health in the United States: Preparedness, Programs and Perceptions of Local Public Health Department Directors

Edward W. Maibach<sup>1\*</sup>, Amy Chadwick<sup>2</sup>, Dennis McBride<sup>3</sup>, Michelle Chuk<sup>4</sup>, Kristie L. Ebi<sup>5</sup>, John Balbus<sup>6</sup>

**1** Center for Climate Change Communication, George Mason University, Fairfax, Virginia, United States of America, **2** The Pennsylvania State University, State College, Pennsylvania, United States of America, **3** Milford Department of Health, Milford, Connecticut, United States of America, **4** National Association of County & City Health Officials, Washington D. C., United States of America, **5** E5S, LLC, Alexandria, Virginia, United States of America, **6** Environmental Defense, Washington D. C., United States of America

### Abstract

While climate change is inherently a global problem, its public health impacts will be experienced most acutely at the local and regional level, with some jurisdictions likely to be more burdened than others. The public health infrastructure in the U.S. is organized largely as an interlocking set of public agencies at the federal, state and local level, with lead responsibility for each city or county often residing at the local level. To understand how directors of local public health departments view and are responding to climate change as a public health issue, we conducted a telephone survey with 133 randomly selected local health department directors, representing a 61% response rate. A majority of respondents perceived climate change to be a problem in their jurisdiction, a problem they viewed as likely to become more common or severe over the next 20 years. Only a small minority of respondents, however, had yet made climate change adaptation or prevention a top priority for their health department. This discrepancy between problem recognition and programmatic responses may be due, in part, to several factors: most respondents felt personnel in their health department—and other key stakeholders in their community—had a lack of knowledge about climate change; relatively few respondents felt their own health department, their state health department, or the Centers for Disease Control and Prevention had the necessary expertise to help them create an effective mitigation or adaptation plan for their jurisdiction; and most respondents felt that their health department needed additional funding, staff and staff training to respond effectively to climate change. These data make

# Massive defunding of the US public health system: Local health departments

Figure 4. Estimated Number of LHD Job Losses (Over Time) and Job Additions (Jan 2011 – Jun 2011)

JOB LOSSES (LAYOFFS OR ATTRITION)	
2008	7,000
2009	16,000
2010	6,000
First half of 2011	5,400
<b>TOTAL</b>	<b>34,400</b>
JOB ADDITIONS (JAN-JUN 2011)	
New positions	1,400
Vacancies filled due to lift of previous hiring freeze	400
<b>TOTAL</b>	<b>1,800</b>

Figure 5. Percentage of LHDs Affected by Job Losses and Cuts to Staff Hours or Imposed Furlough, and Percentage of Population Living in Jurisdictions of Affected LHDs (Jan 2011 – Jun 2011)

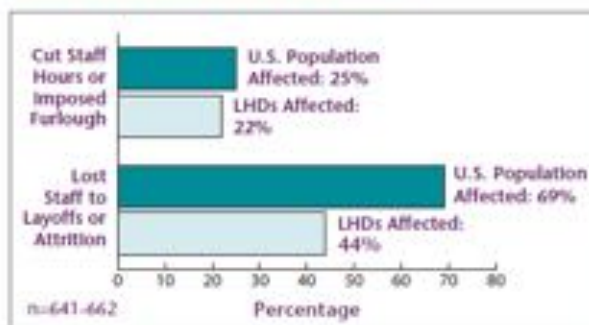
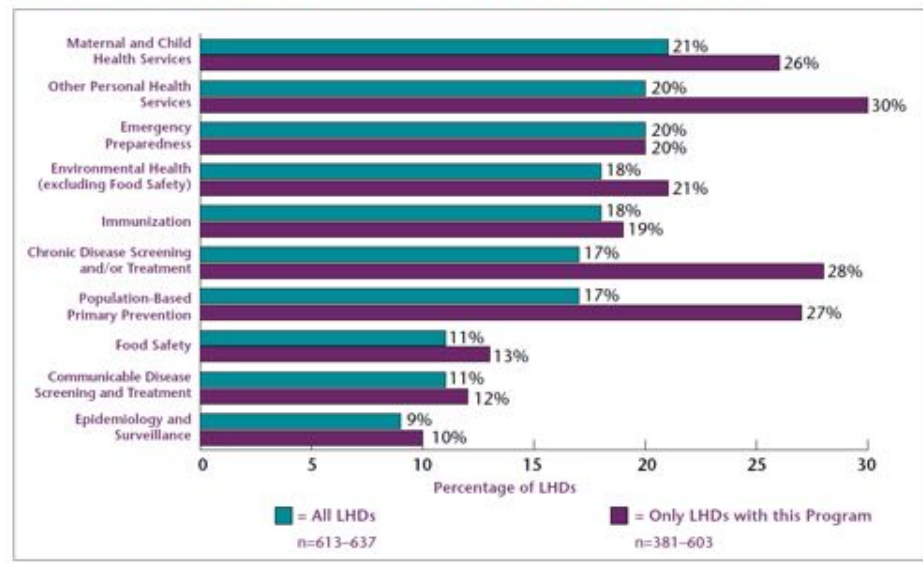
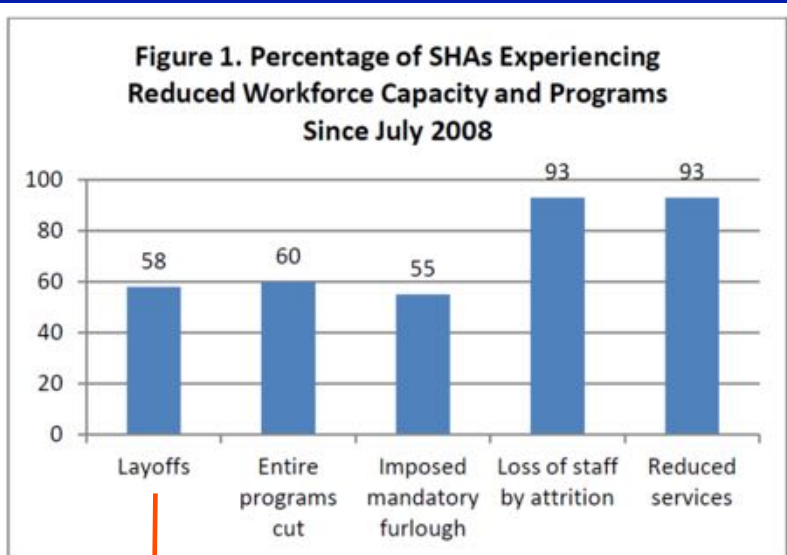


Figure 2. Percentage of LHDs that Reduced or Eliminated Programs (Jul 2010 – Jun 2011)



Source: NACCHO. Local Health Department Job Losses and Program Cuts: Findings from July 2011 Survey. December 2011. <http://www.naccho.org/topics/infrastructure/lhdbudget/upload/JobLossRepor122011FINALUpdated.pdf>

# Massive defunding of the US public health system: State health departments



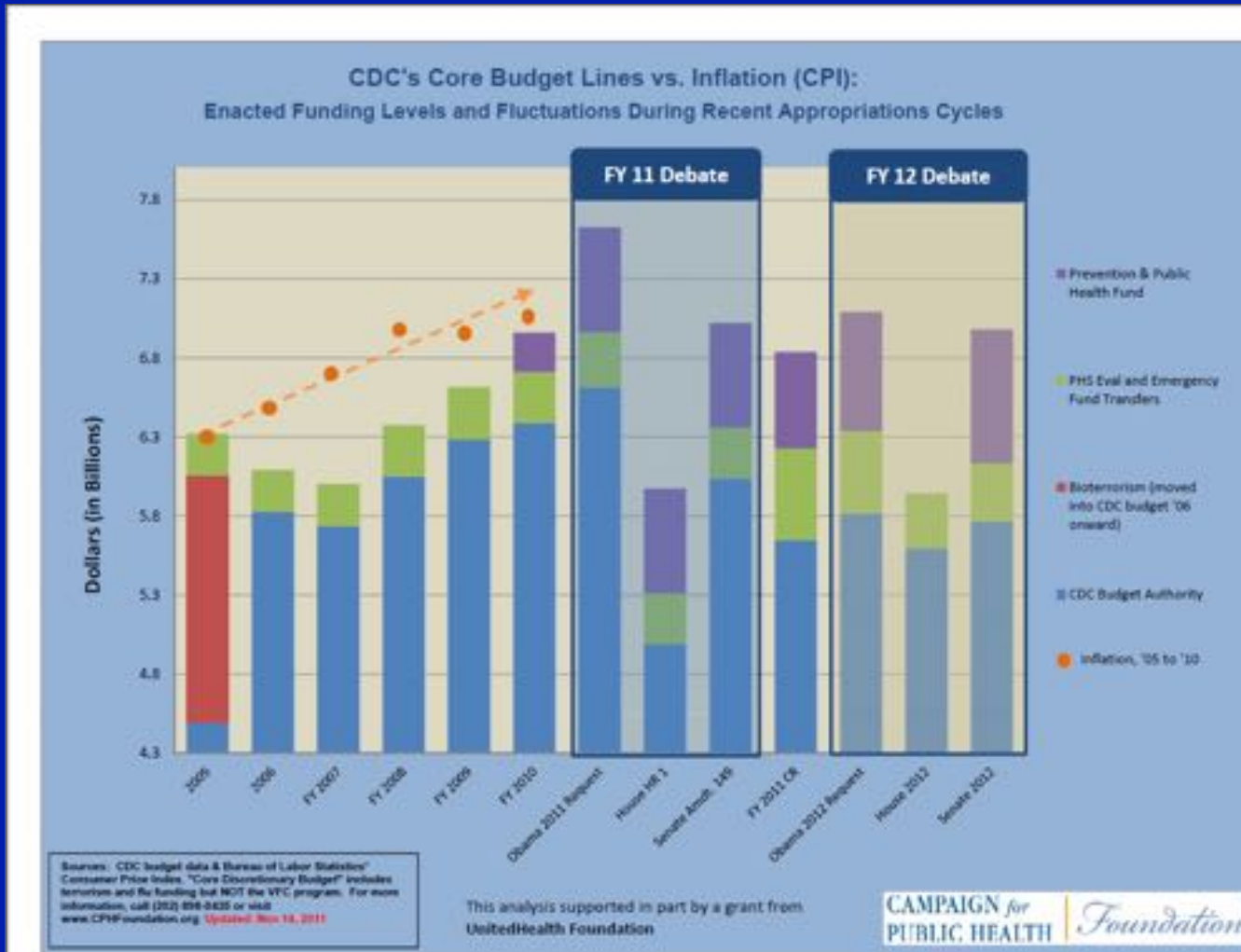
16,830 jobs lost  
7/08 - 8/10

Source: ASTHO. Budget Cuts Continue to Affect the Health of Americans: Update May 2011. <http://www.astho.org/Display/AssetDisplay.aspx?id=6024>

**Table 1. Number and Percentage of SHAs with Program Cuts Since July 2008 by Program Area (N=55)**

	Number with Program Cuts	As % of the Whole
HIV, AIDS and STDs	21	38%
Disease-specific programs (e.g. heart disease, Parkinson's, Alzheimer's, tuberculosis, cystic fibrosis, asthma, epilepsy)	18	33%
Tobacco prevention and control	17	31%
Public health hospitals and clinics	17	31%
Immunization	16	29%
Laboratory services	15	27%
Teen pregnancy prevention	14	25%
Workforce and quality improvement	13	24%
Cancer programs	12	22%
Family health and nutrition (including WIC)	12	22%
Maternal and child health	12	22%

# Massive defunding of the US public health system: CDC



Source: Campaign for Public Health Foundation. November 2011. <http://www.cphfoundation.org/budget.html>



# Vulnerability and magnitude

- An indifferent, distracted, uninformed and skeptical public
- Enormous psychological barriers to attitude change
- Active efforts to deny and obscure
- A scientific culture of non-advocacy
- Depraved indifference to science by some political and thought leaders
- Declining social capital, faith in government
- Inadequate commitment by health agency leadership
- A public health system in crisis



# What now?

- Assess the state of science and practice
- Identify science gaps and work to fill them
- Work to translate science into action
- Address barriers to translation
  - Communication barriers
  - Psychological barriers
  - Political barriers
  - Public health infrastructure barriers



Thank  
you!