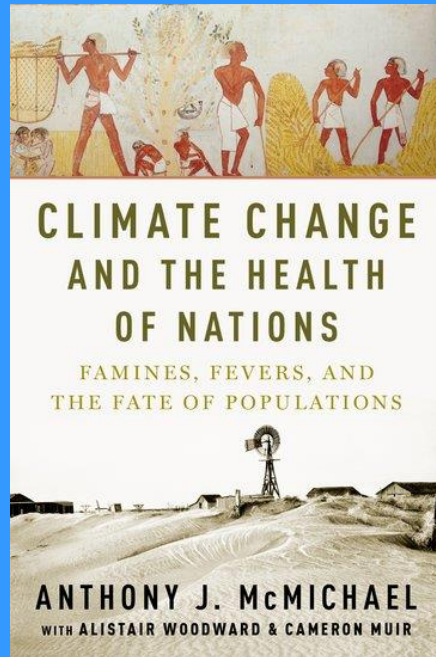


Children's Environmental Health

Built Environment, Climate Change and Governance

Honolulu, Hawaii

March 11, 2017



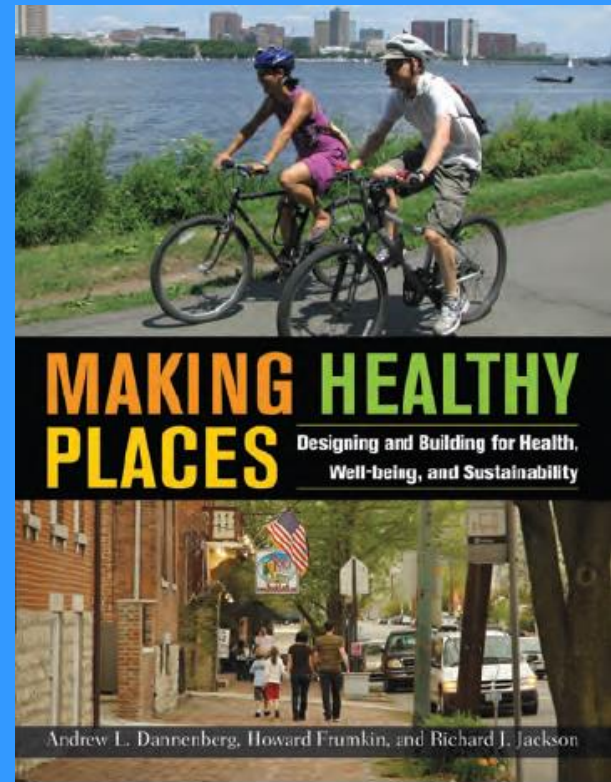
Richard J Jackson MD MPH

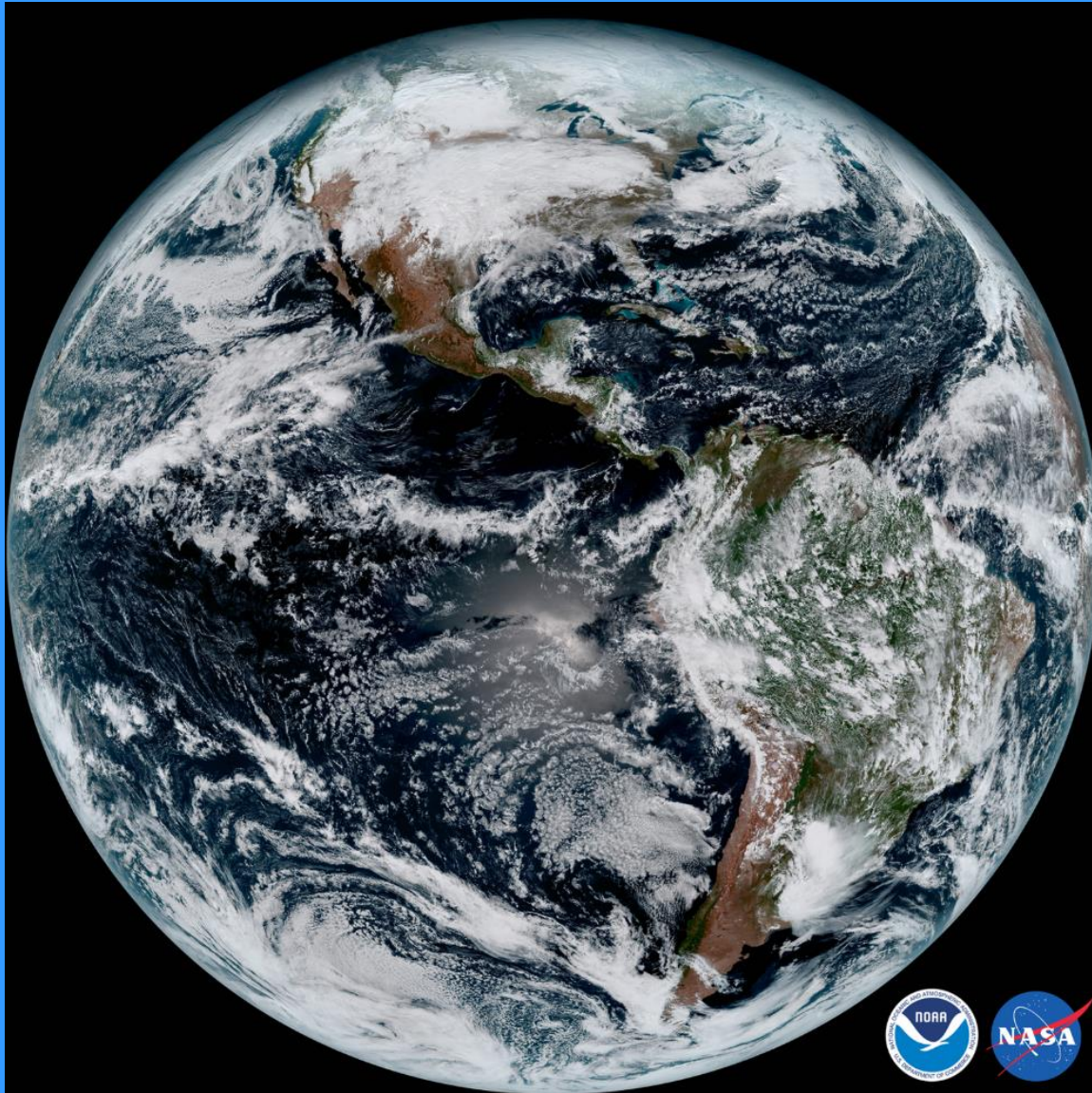
FAAP HonAIA HonFASLA

dickjackson@ucla.edu

UCLA

Fielding School of Public Health





First Earth
Photo
Jan 23, 2017
GOES-16
Satellite
(full color)

“Earth Now -- Visible Earth” App



Earth-Now

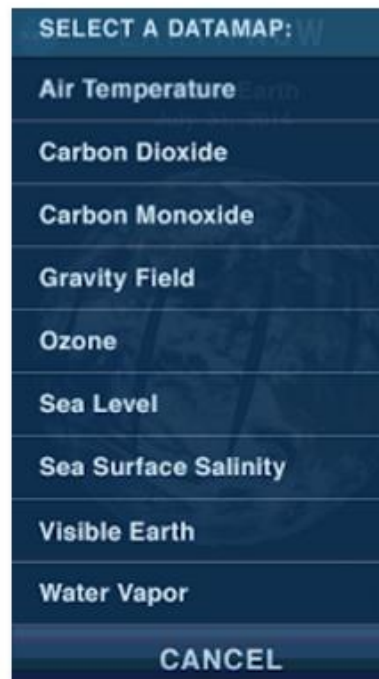
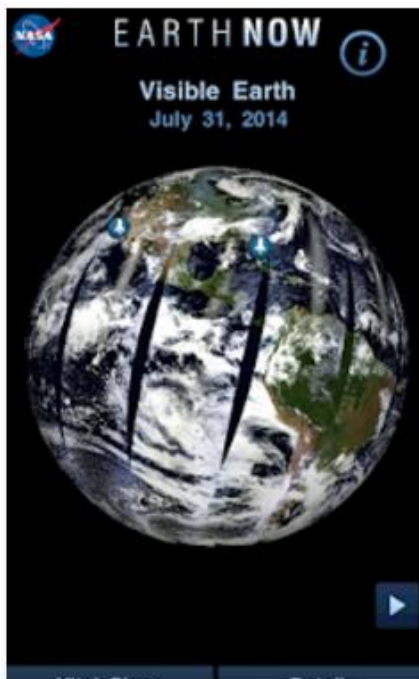
Jet Propulsion Laboratory Education

★★★★☆ 10,895

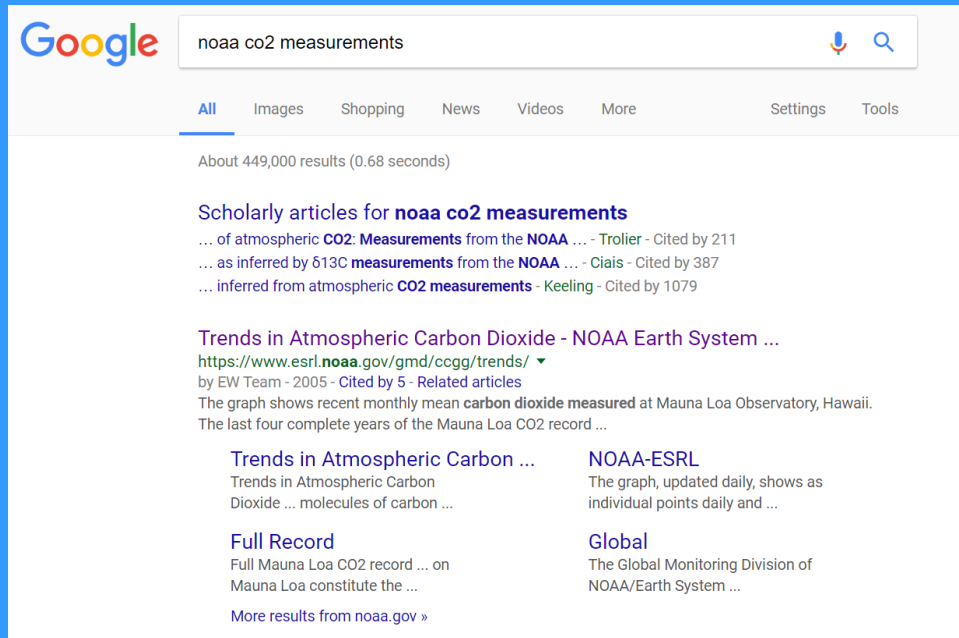
E Everyone

i This app is compatible with all of your devices.

Installed



On February 26, 2017 a search on NOAA CO₂ Data Revealed:



The screenshot shows a Google search interface with the query 'noaa co2 measurements'. The search results are categorized under 'All' and show approximately 449,000 results. The top result is a scholarly article titled 'Scholarly articles for noaa co2 measurements', which includes sub-entries for 'atmospheric CO2: Measurements from the NOAA ...', 'as inferred by δ13C measurements from the NOAA ...', and 'inferred from atmospheric CO2 measurements'. Below this, there is a link to 'Trends in Atmospheric Carbon Dioxide - NOAA Earth System ...' with a URL and a brief description of the graph. Further down, there are two columns of related links: 'Trends in Atmospheric Carbon ...' and 'NOAA-ESRL', and 'Full Record' and 'Global'.

Google noaa co2 measurements

All Images Shopping News Videos More Settings Tools

About 449,000 results (0.68 seconds)

Scholarly articles for noaa co2 measurements

- ... of atmospheric **CO2: Measurements** from the **NOAA** ... - Trolier - Cited by 211
- ... as inferred by **δ13C measurements** from the **NOAA** ... - Ciais - Cited by 387
- ... inferred from atmospheric **CO2 measurements** - Keeling - Cited by 1079

Trends in Atmospheric Carbon Dioxide - NOAA Earth System ...
<https://www.esrl.noaa.gov/gmd/ccgg/trends/>
by EW Team - 2005 - Cited by 5 - Related articles
The graph shows recent monthly mean **carbon dioxide** measured at Mauna Loa Observatory, Hawaii.
The last four complete years of the Mauna Loa CO2 record ...

Trends in Atmospheric Carbon ... Trends in Atmospheric Carbon Dioxide ... molecules of carbon ...	NOAA-ESRL The graph, updated daily, shows as individual points daily and ...
Full Record Full Mauna Loa CO2 record ... on Mauna Loa constitute the ...	Global The Global Monitoring Division of NOAA/Earth System ...

[More results from noaa.gov »](#)



This site can't be reached

The webpage at <https://www.esrl.noaa.gov/gmd/ccgg/trends/weekly.html> might be temporarily down or it may have moved permanently to a new web address.

ERR_TUNNEL_CONNECTION_FAILED

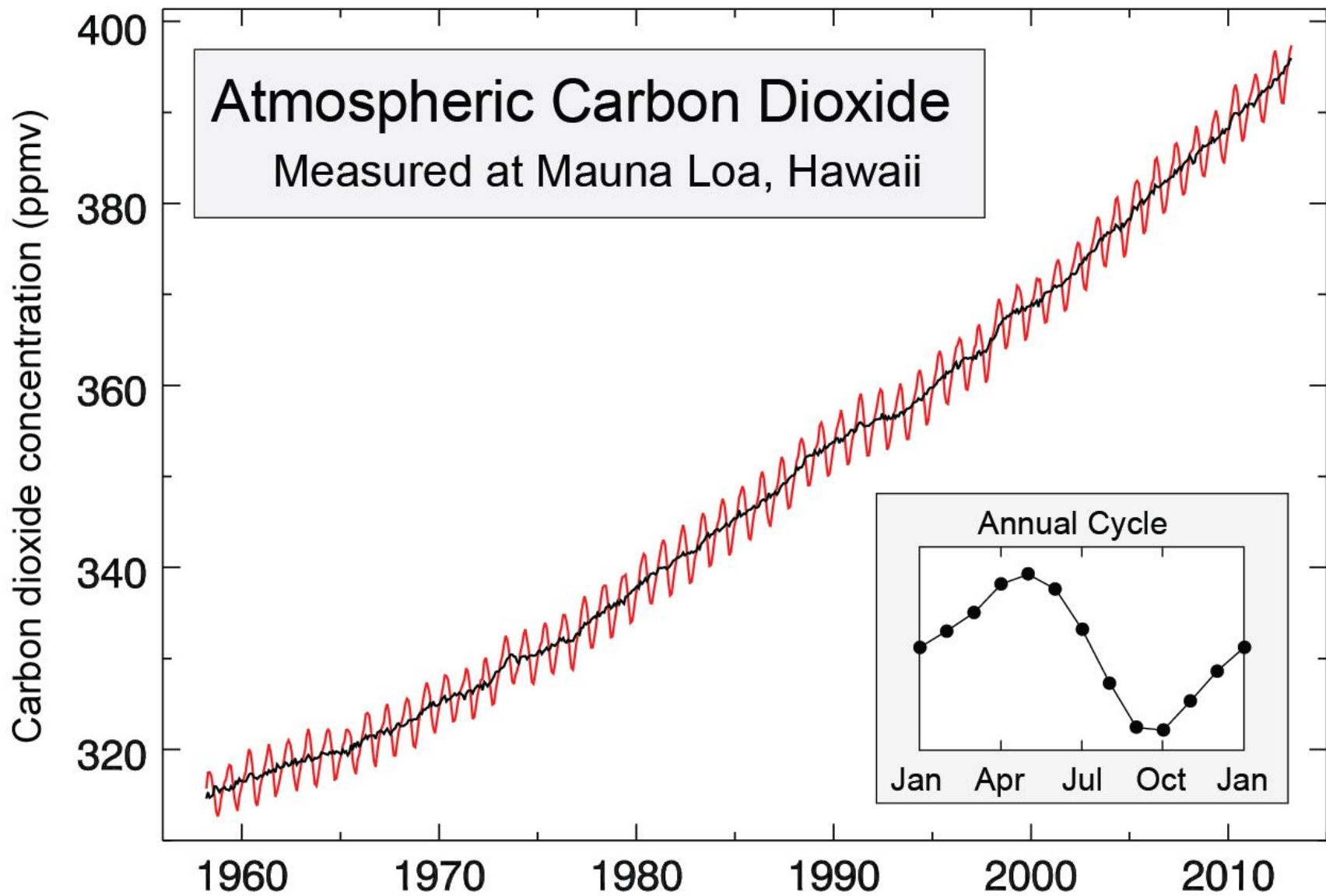
**Bloomberg
Businessweek**

November 5—November 11, 2002 | businessweek.com

IT'S GLOBAL WARMING, STUPID

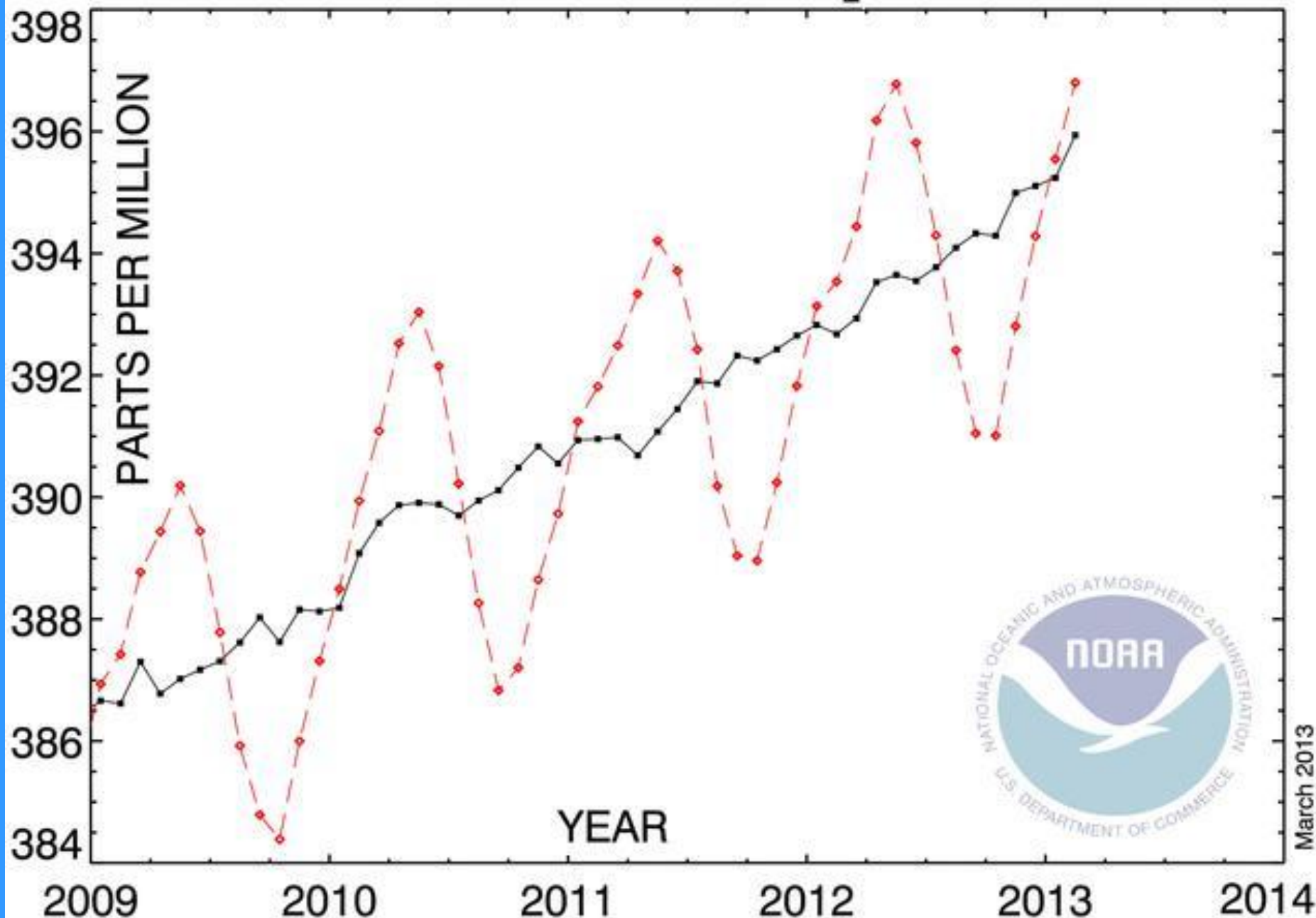
PH





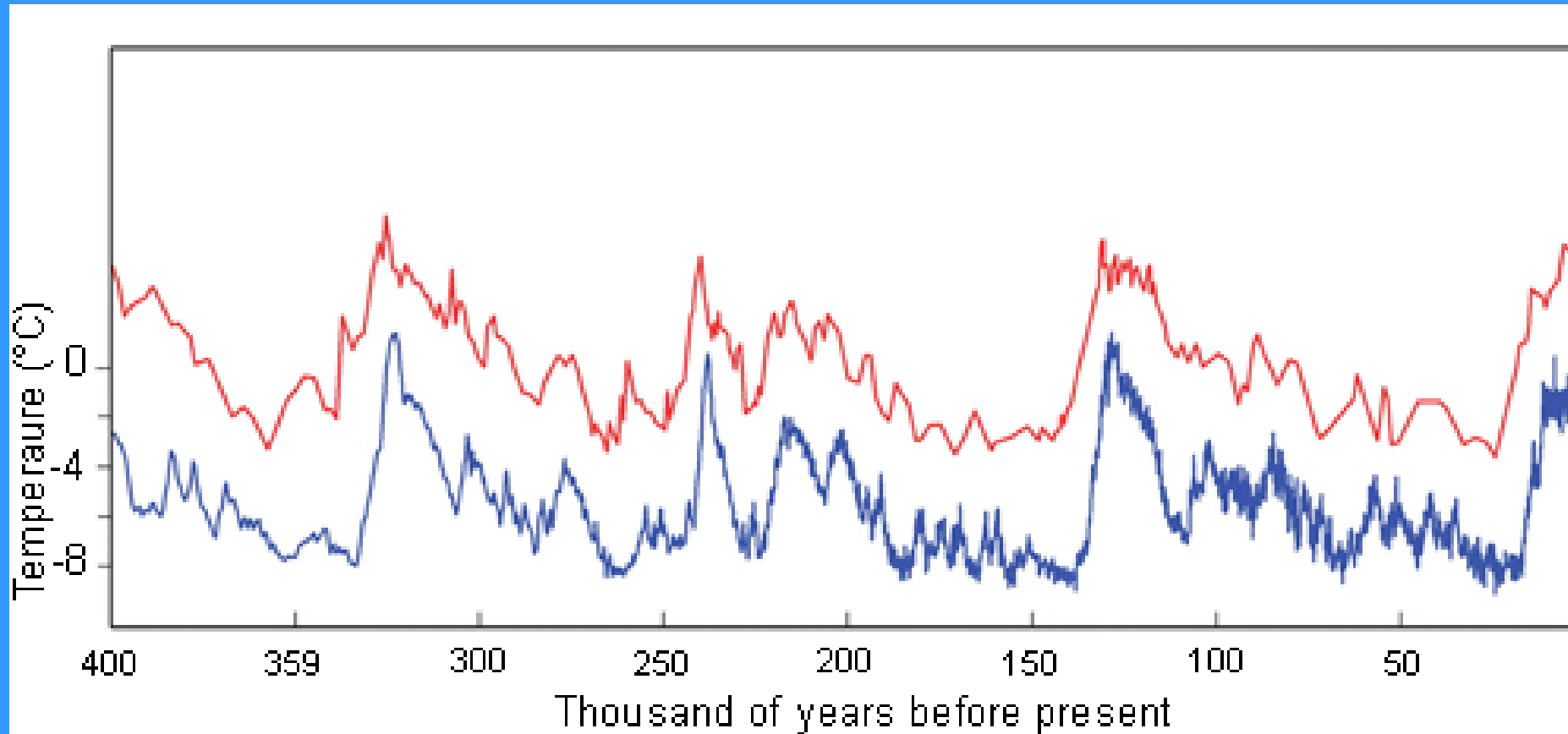
April 2013

RECENT MONTHLY MEAN CO₂ AT MAUNA LOA



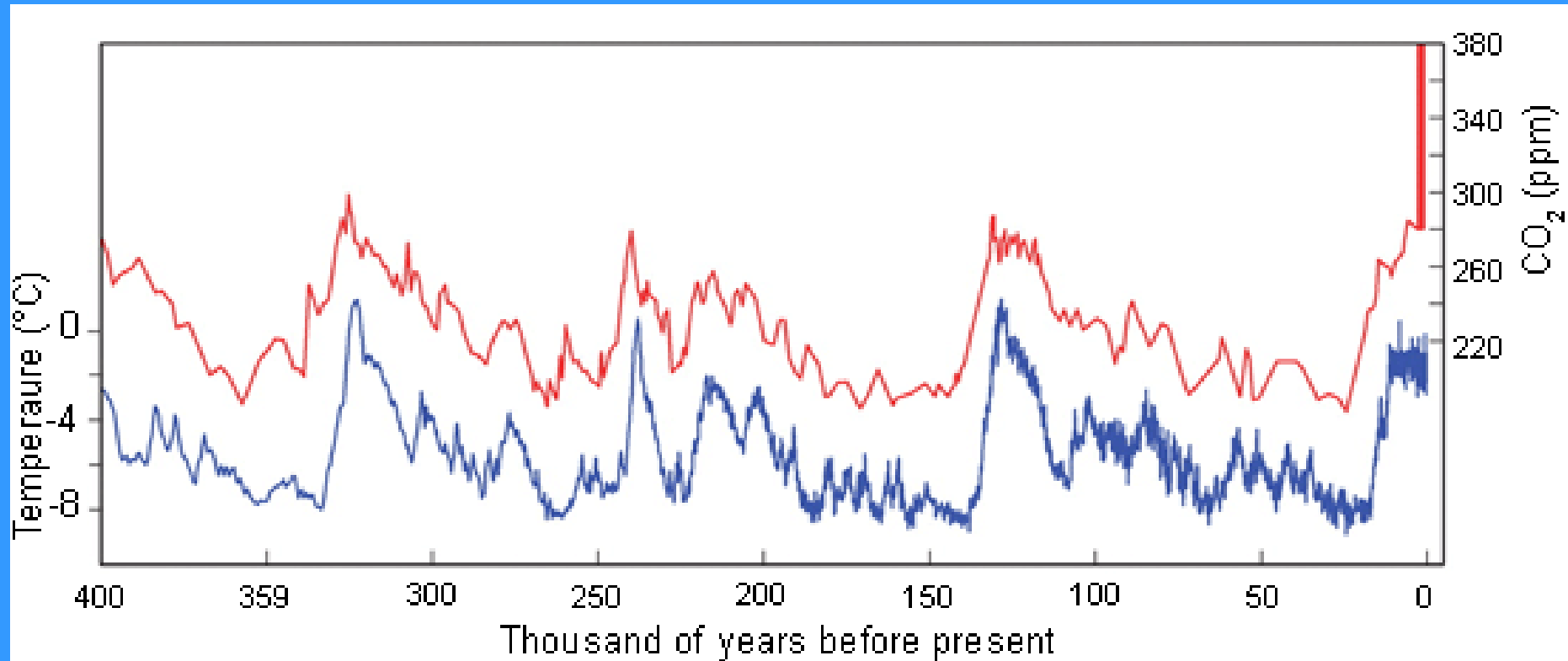
March 2013

Changes in CO₂ and Temperature in the last 399,000 years



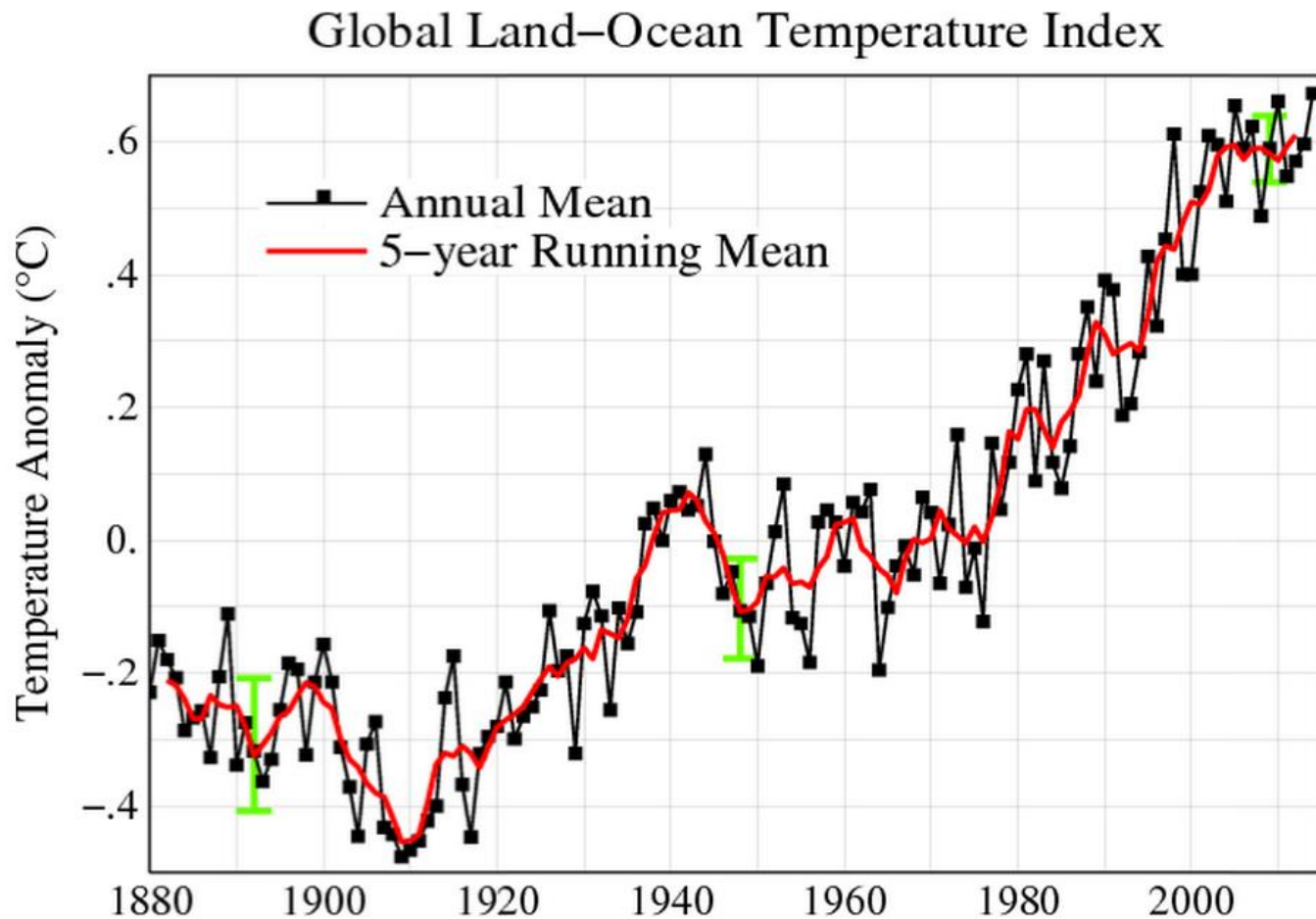
A. V. Fedorov et al. *Science* 312, 1485 (2006).

Changes in CO₂ and Temperature in the last 400,000 years

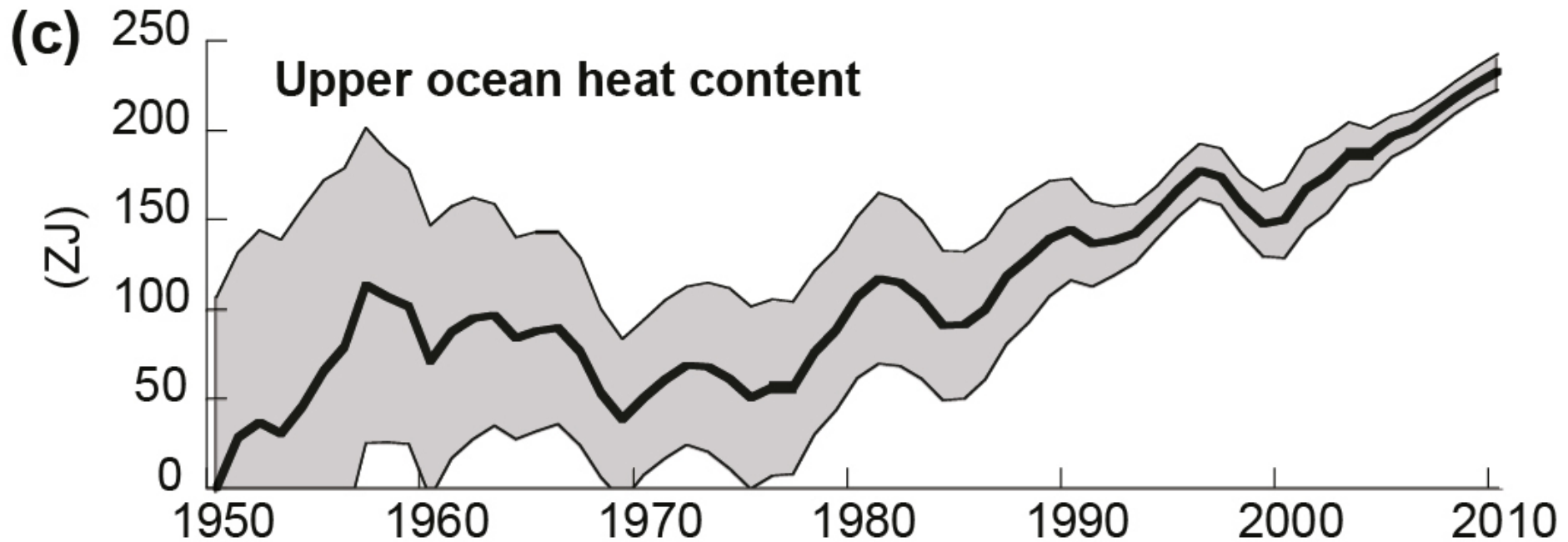


A. V. Fedorov et al. *Science* 312, 1485 (2006).

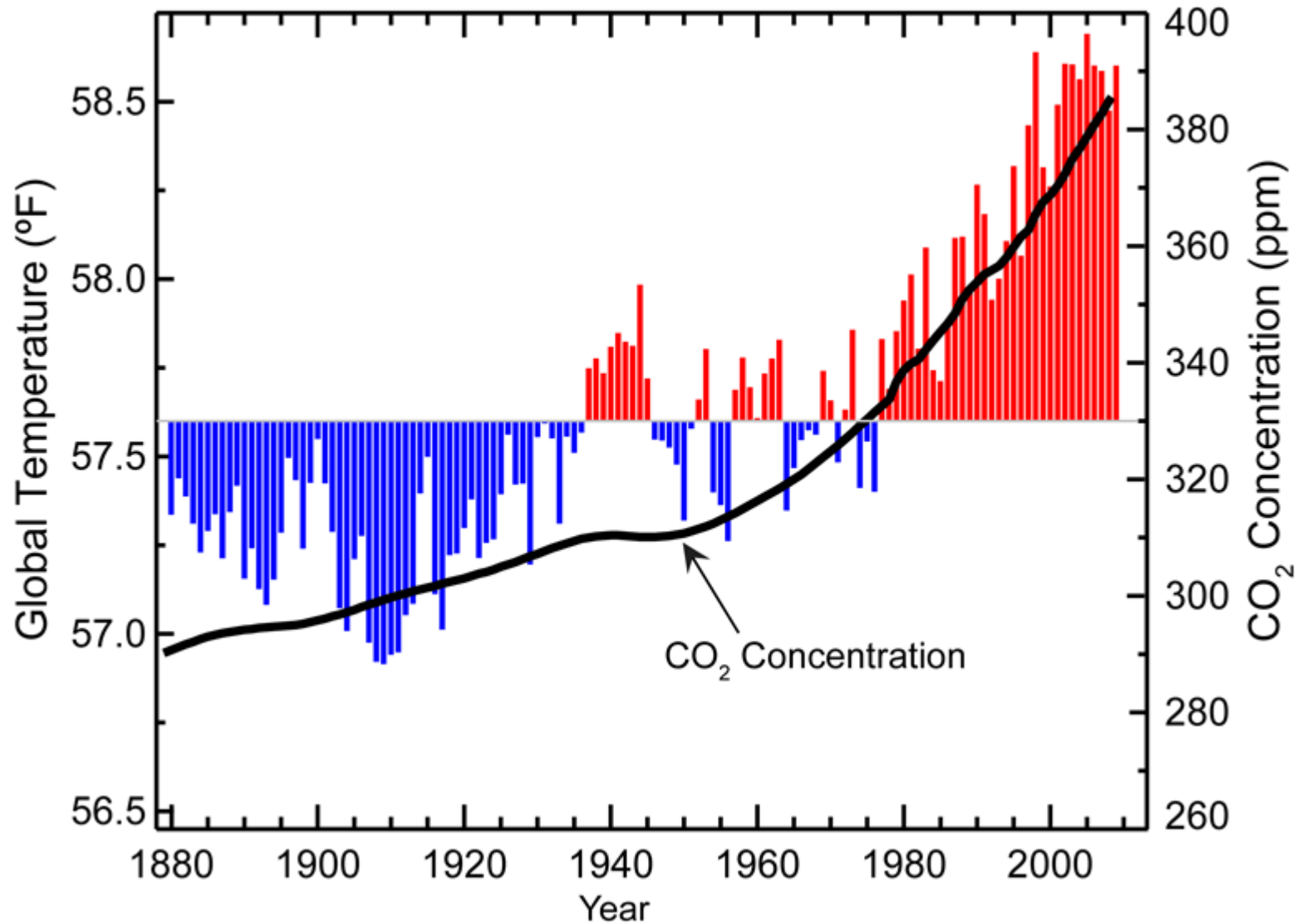
Global Temperature Increase Since 1880: 1.4 F



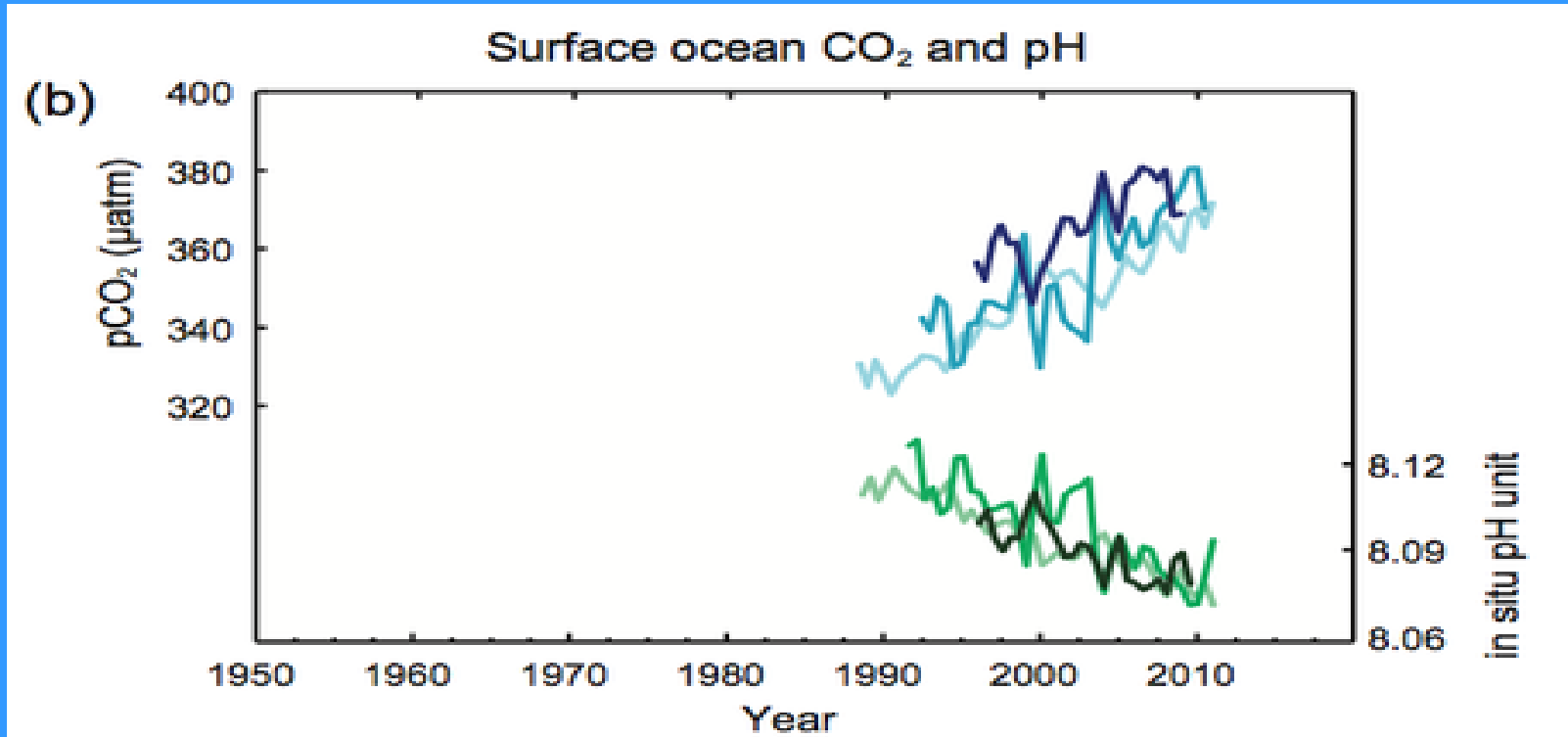
Ocean Changes – Heat Content



Global Temperature and Carbon Dioxide

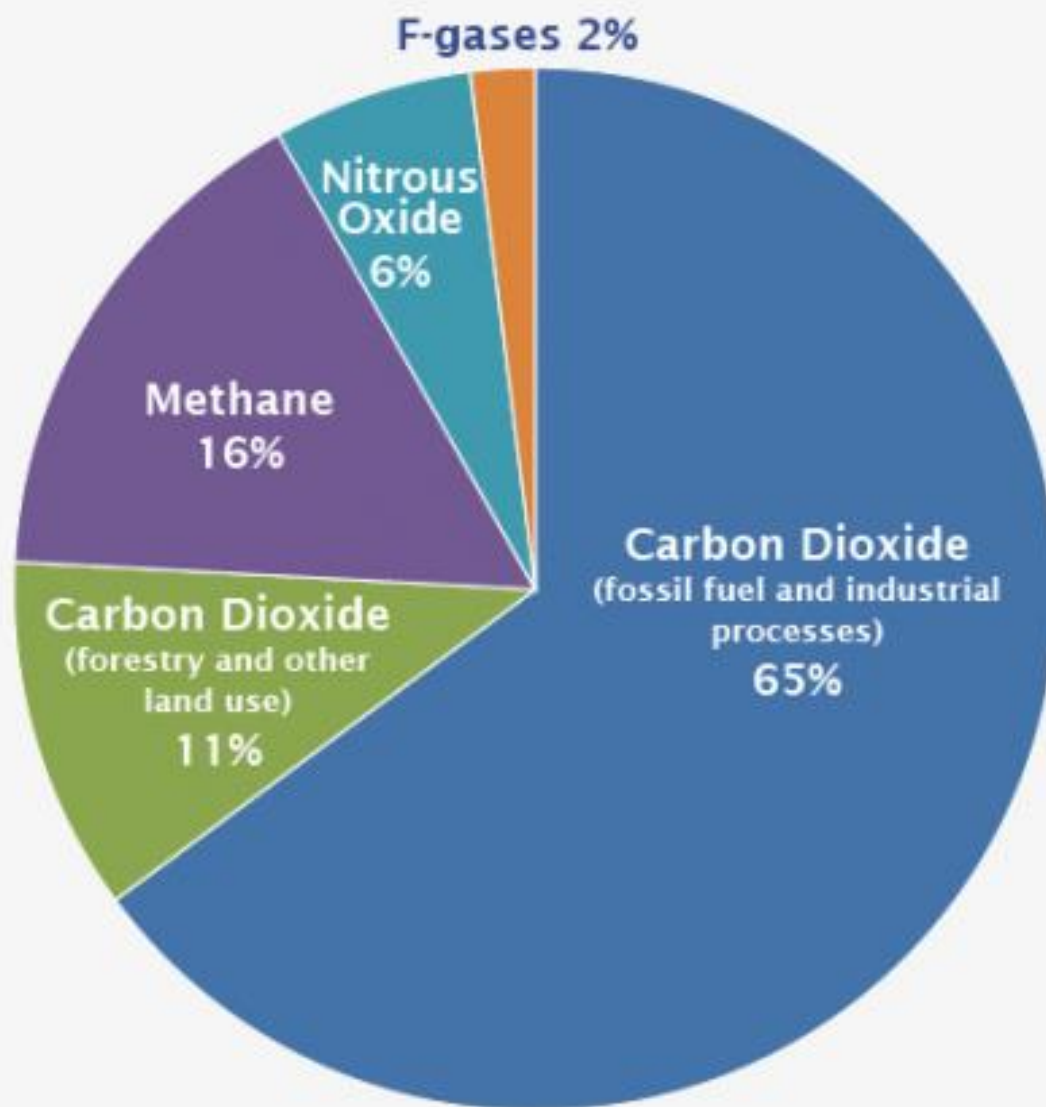


Surface Ocean CO₂ and pH



Since the Industrial Revolution, the oceans have become 30 percent more acidic -- the pH of ocean surface water has dropped from roughly 8.18 to 8.07.

Global Greenhouse Gas Emissions by Gas





EPA drastically underestimates methane released at drilling sites



A well pad in southwestern Pennsylvania. A new study finds that methane levels above shale gas wells during the drilling stage are up to 1,000 times higher than EPA estimates. (Photo courtesy of Dana Caulton)



Fossil fuels subsidised by \$10m a minute, says IMF

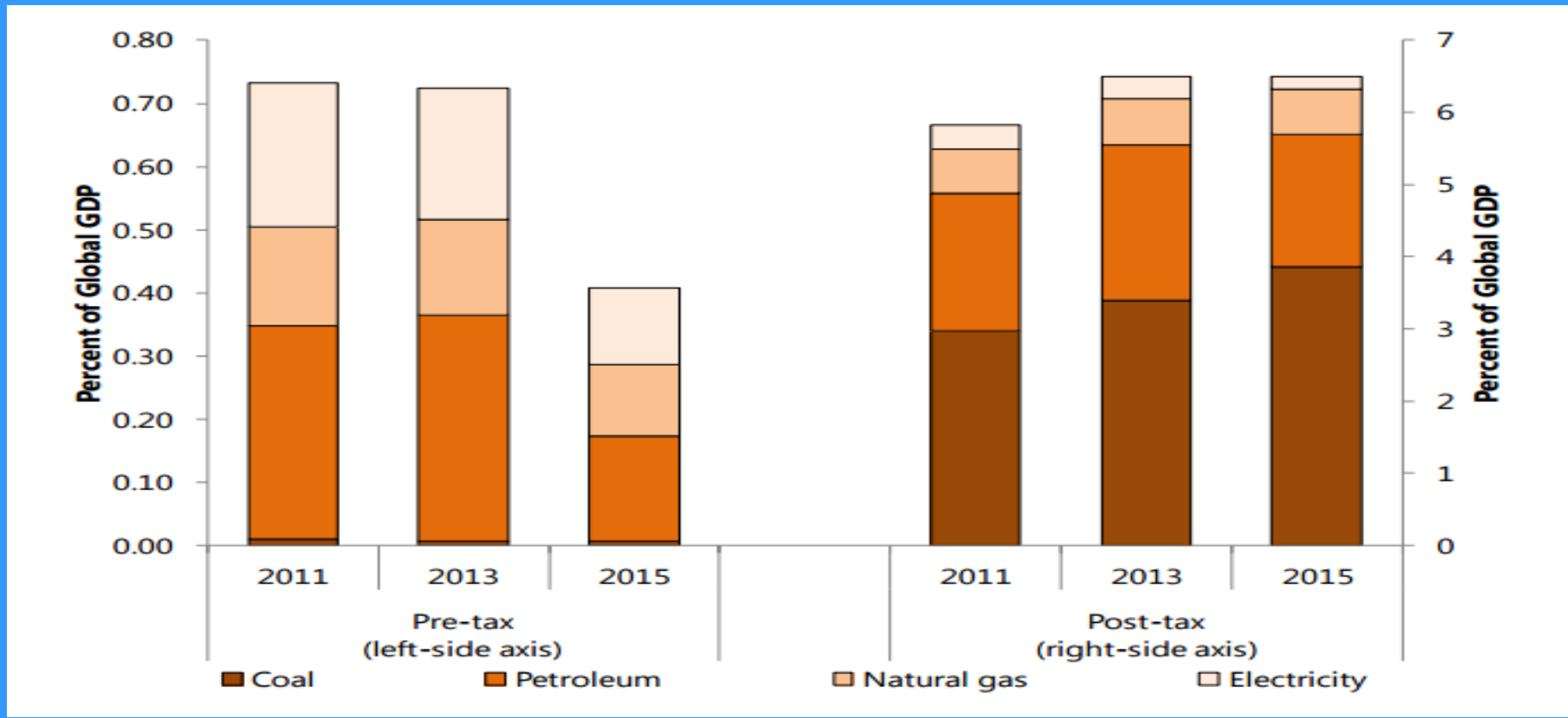
'Shocking' revelation finds \$5.3tn subsidy estimate for 2015 is greater than the total health spending of all the world's governments



Why we need to keep fossil fuels in the ground

Global Energy Subsidies 2011-2015

Pre-tax and post-tax



<http://www.imf.org/external/pubs/ft/wp/2015/wp15105.pdf>

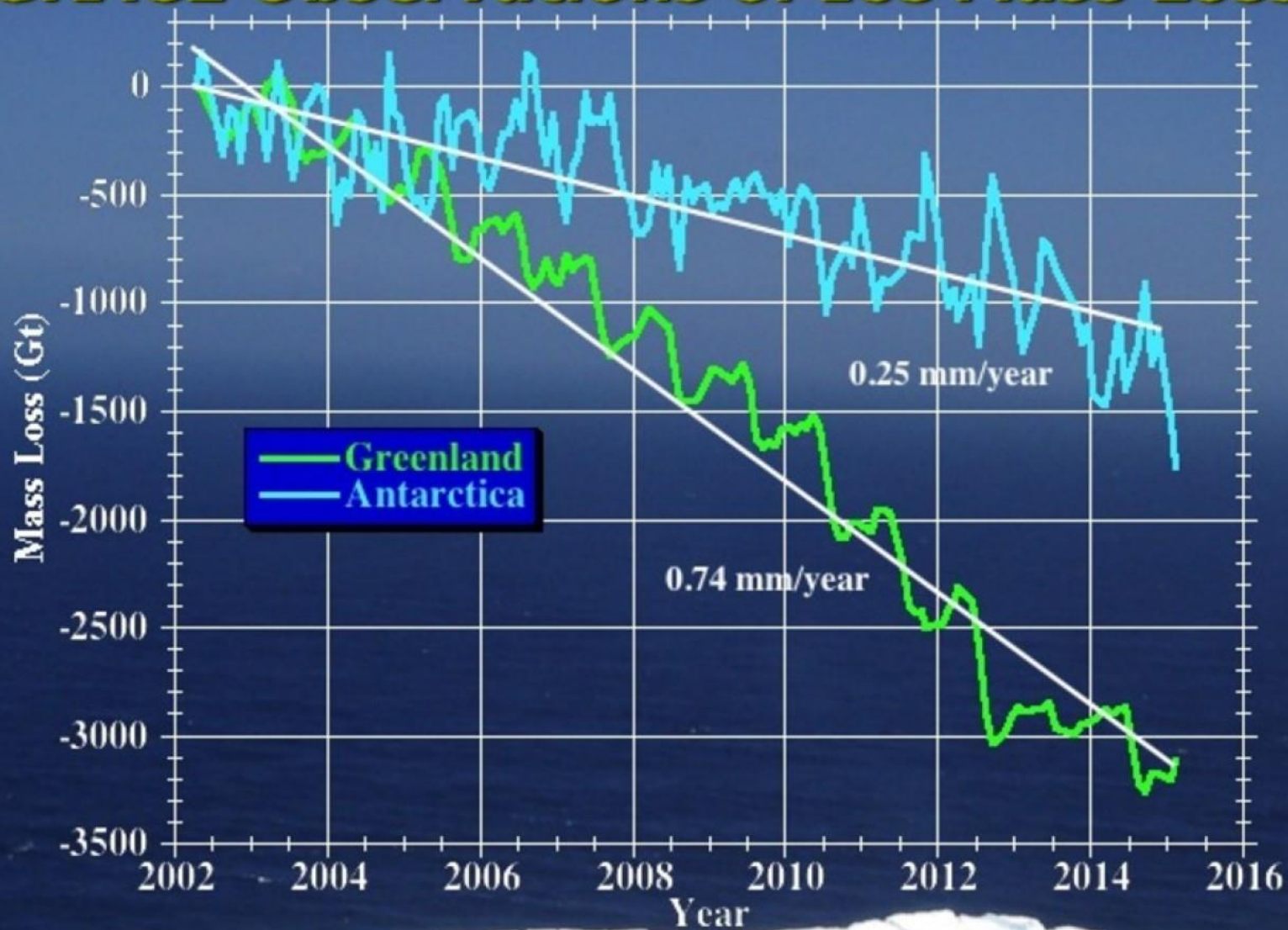
Chinese Glacier's Retreat Signals Trouble for Asian

By EDWARD WONG DEC. 8, 2015



The Mengke Glacier, one of China's largest, retreated an average of 54 feet a year from 2005 to 2014. From 1993 to 2005, it retreated 26 feet a year. Adam Dean for The New York Times

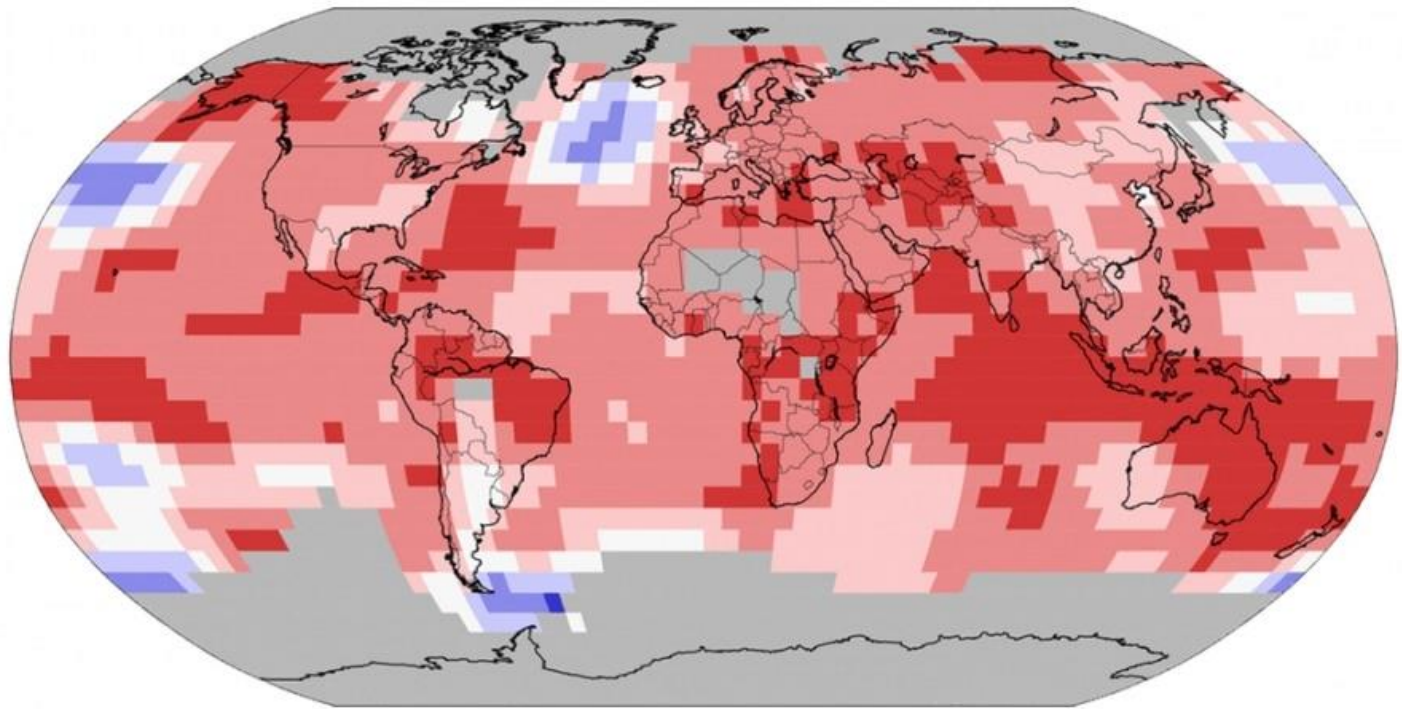
GRACE Observations of Ice Mass Loss



Sea Level Change Team (N-SLCT)

2016: Hottest Year So Far

Land and ocean temperature percentiles Jan-Jun 2016

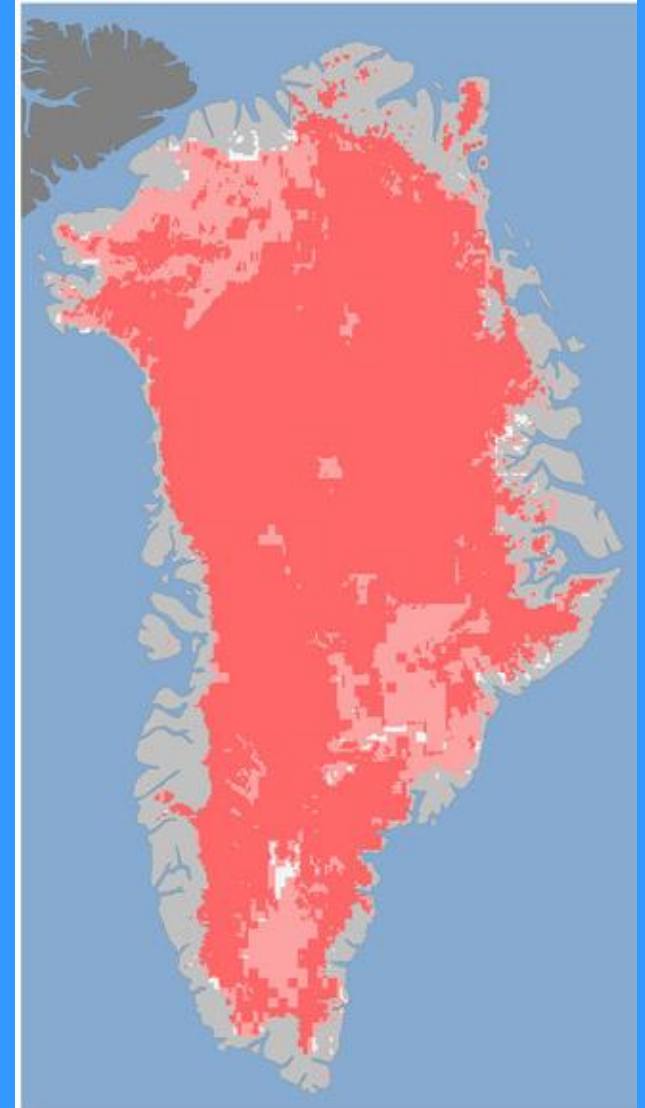


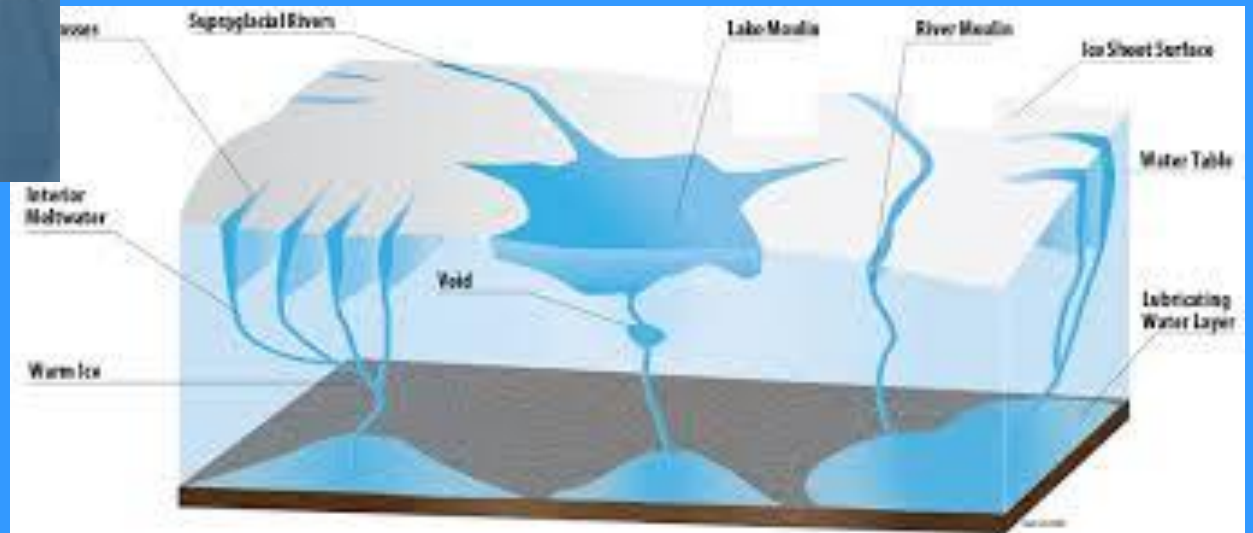
Source: NOAA NCEI

CLIMATE  CENTRAL

Greenland Surface Ice melt July 12, 2012

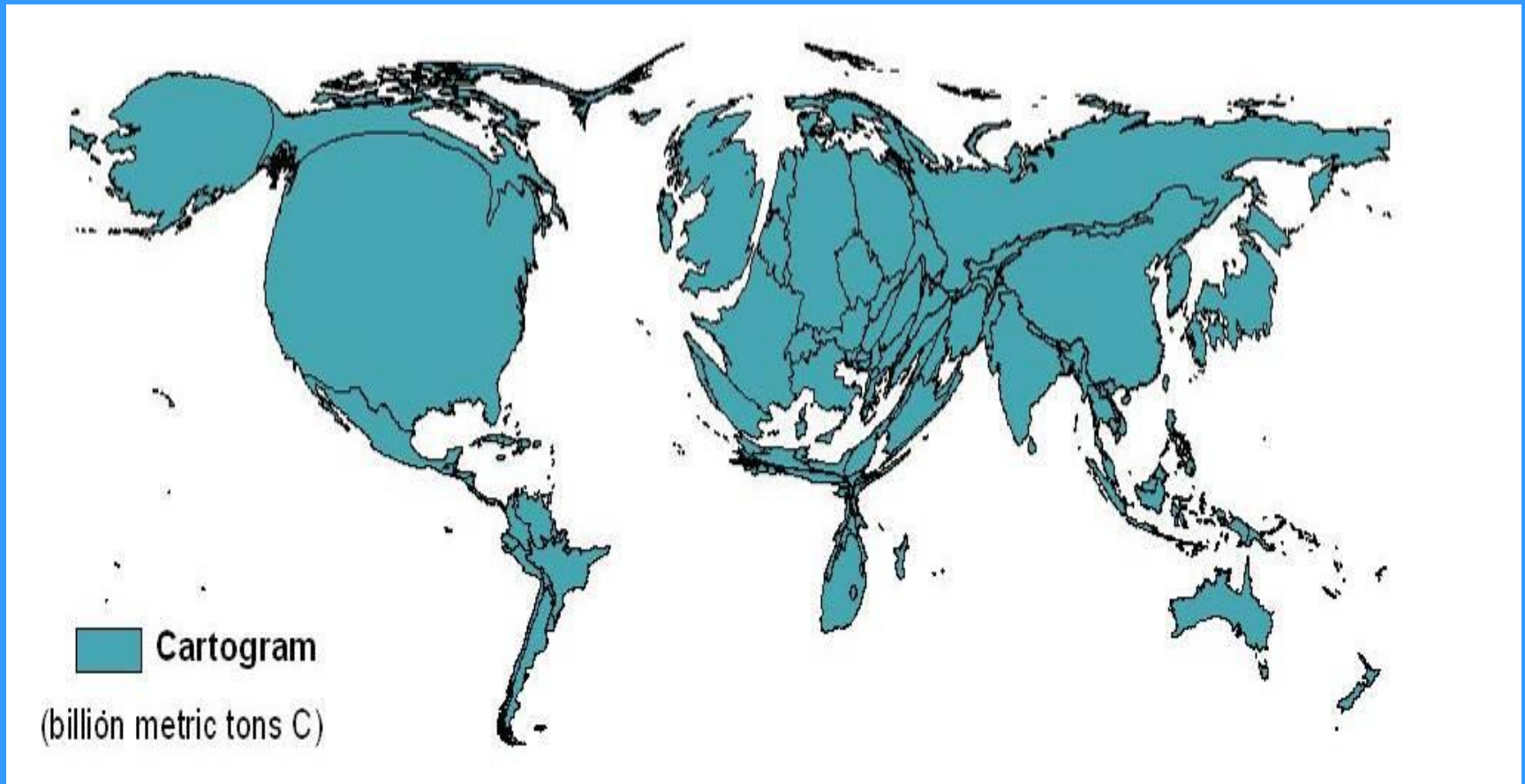
Deepest Pink Indicates Surface Has Melted





CUMULATIVE greenhouse emissions in 2002, by country

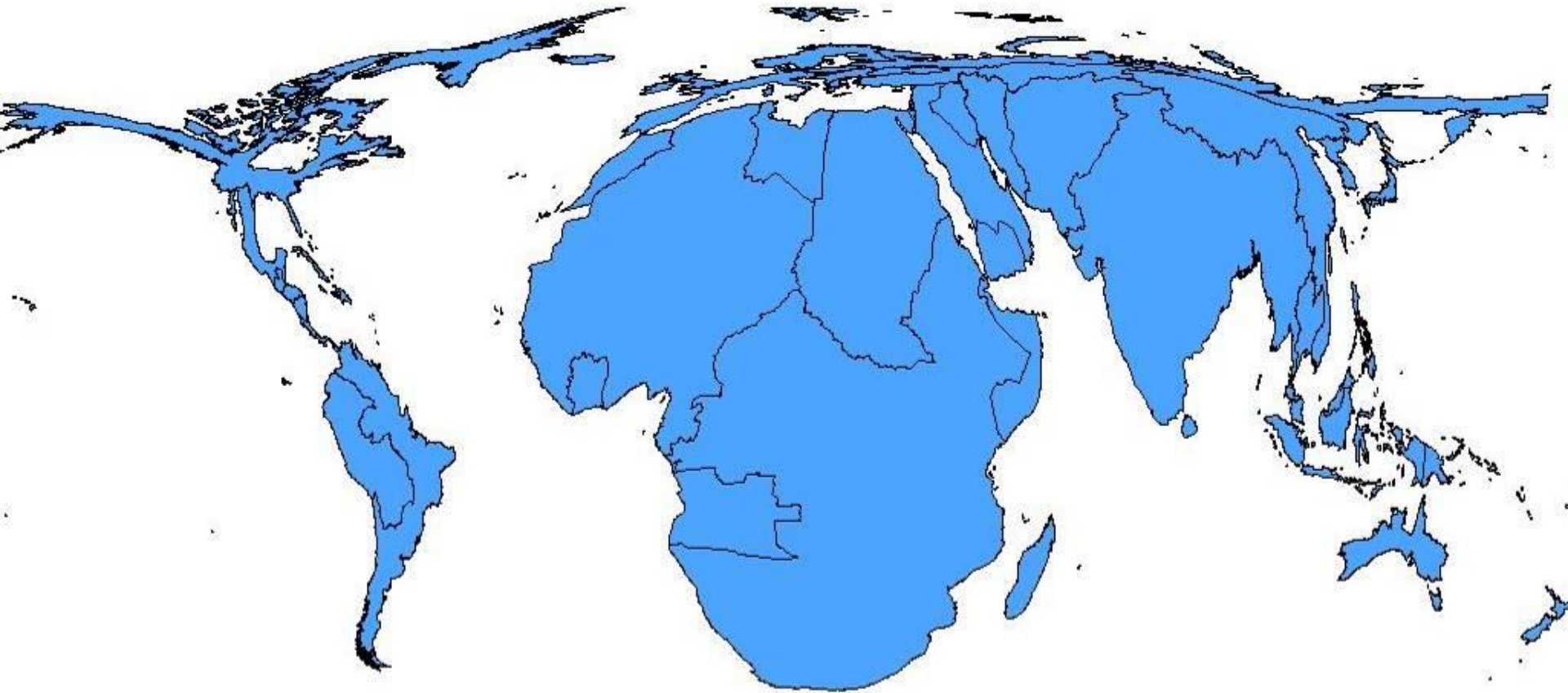
Density-equalizing cartogram



Jonathan Patz,
University of Wisconsin

Climate-related mortality (per 10^6 population), 2000

Density-equalizing cartogram: WHO region size proportional to mortality



Jonathan Patz

University of Wisconsin

Population Displacement

Drought, floods, other natural hazards change habitability of regions around the world.



- 10% of world population lives within 10m of sea level
- Health impacts:
 - Malnutrition (up to 50%),
 - Infectious disease,
 - Trauma (30-75% of children with PTSD from mental/physical/sexual trauma)
 - Civil Strife

These two cities have similar populations.



0 10 20 (km)

POPULATION: **5.25 MILLION**
URBAN AREA: **4,280 KM²**



0 10 20 (km)

POPULATION: **5.33 MILLION**
URBAN AREA: **162 KM²**

Atlanta

Barcelona



0 10 20 (km)



0 10 20 (km)

POPULATION:	5.25 MILLION
URBAN AREA:	4,280 KM²
TRANSPORT	
CARBON EMISSIONS:	7.5
TONNES CO ₂ PER PERSON	
(PUBLIC + PRIVATE	
TRANSPORT)	

POPULATION:	5.33 MILLION
URBAN AREA:	162 KM²
TRANSPORT	
CARBON EMISSIONS:	0.7
TONNES CO ₂ PER PERSON	
(PUBLIC + PRIVATE	
TRANSPORT)	

July 6, 1999



- The Built Environment – how we build our homes, workplaces, towns, cities and world





The US has more cars than licensed drivers.



Traffic along LA freeways and Wilshire Blvd.

“Old” Schools



Credit: Manitovic Public School District



Credit: Hummel Architects, Boise, ID

“Modern” Schools



Credit: South Carolina Coastal Conservation League



Credit: Constance E. Beaumont, NTHP

We have changed how much we walk or bike

- Percent of children who walk or bike to school:
 - 1974 → **66%**
 - 2000 → **13%**
- (CDC, 2000)



This does not remove CO₂





The LA County Parking Crater:

18.6 Million Parking Spots Use 200 Square Miles of Space



“The Status of Baby Boomers’ Health in the United States: The Healthiest Generation?”

JAMA Internal
Medicine
February 4, 2013

RESEARCH LETTER

ONLINE FIRST

The Status of Baby Boomers' Health in the United States: The Healthiest Generation?

From 1946 through 1964, 78 million children (“baby boomers”) were born in the United States. In 2010, baby boomers made up 26.1% of the US population.¹ Medicine has improved significantly during baby boomers’ lifetimes. Although these advantages have led to a progressively increasing life expectancy,² previous studies have shown mixed results regarding whether baby boomers are healthier than prior generations.^{3,4} The present study examined the health status of aging baby boomers relative to the previous generation to provide a vitally important context for health workforce and policy planning in the coming years.

Methods. We analyzed data from the National Health and Nutrition Examination Survey (NHANES), including NHANES III (1988-1994) (for previous generation) and the NHANES for 2007 to 2010 (for baby boomers), focusing on respondents who were aged 46 to 64 years during either period. The 2 cohorts were compared with regard to health status, functional and work disability, healthy lifestyle characteristics, and presence of chronic disease. Further details of the methods can be found in the eAppendix (<http://www.jamainternalmed.com>).

Results. The demographic characteristics of the cohorts were very similar except for the proportions in each racial/ethnic group, with greater proportions of non-Hispanic blacks (11.3% vs 9.4%) and Hispanics (9.8% vs 3.7%) in the 2007-2010 group compared with the 1988-1994 group ($P < .001$). The mean (SD) ages were 54.1 (0.03) years in the 2007-2010 group and 54.5 (0.03) years in the 1988-1994 group; there was no difference in sex between the 2 cohorts (49.1% male [2007-2010 group] vs 47.5% male [1988-1994 group]). Overall health status was lower in baby boomers, with 13.2% reporting “excellent” health compared with 3.2% of individuals in the previous generation ($P < .001$). Of the sampled baby boomers, compared with the previous generation, 6.5% vs 3.3% used a walking assist device ($P < .001$), 13.8% vs 10.1% were limited in work ($P = .003$), and 13.5% vs 8.8% had a functional limitation ($P < .001$).

With regard to healthy lifestyle factors, obesity was more common among baby boomers (38.7% obese vs 29.4% [previous generation]; $P < .001$) (Figure), and regular exercise was significantly less frequent (33.0%

vs 49.9% exercise > 12 times per month; $P < .001$); more than half of baby boomers reported no regular physical activity (52.2% vs 17.4%; $P < .001$). Moderate drinking was higher in the baby boomer cohort compared with the previous generation (67.3% vs 37.2%; $P < .001$). There were fewer current smokers in the baby boomer cohort than in the previous generation (21.3% vs 27.6%; $P < .001$).

The percentage of individuals with hypertension (Figure) was more common among baby boomers than among individuals from the previous generation (43.0% vs 36.4%; $P < .001$), as was the percentage of individuals who take medication for hypertension (33.4% vs 23.2%; $P < .001$). Among baby boomers, hypercholesterolemia was more common (73.5% vs 33.8%; $P < .001$ [Figure]), and medication use for hypercholesterolemia was more than 10 times greater (23.9% vs 1.9%; $P < .001$). Baby boomers were also more likely to have diabetes (13.3% vs 12.0%; $P = .003$ [Figure]) and take medication for diabetes (11.3% vs 6.2%; $P < .001$). The slight trend toward higher prevalence of cancer in baby boomers vs the previous generation was not significant (10.6% vs 9.3%; $P = .25$). The frequency of emphysema decreased in the baby boomer generation (2.3% relative to the previous generation (3.3%) ($P = .03$). Baby boomers were also less likely to have had a myocardial infarction (3.6%) compared with the previous generation (3.3%) ($P = .004$).

A logistic regression was conducted to control for changes in demographic characteristics (age, sex, race,

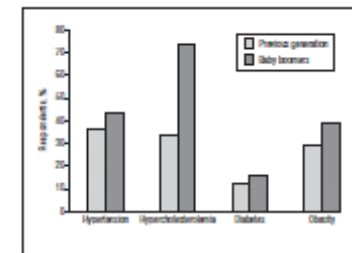


Figure. Proportion of each cohort (baby boomers and previous generation at age 46-64 years) with hypertension, hypercholesterolemia, diabetes, or obesity in the 1988-1994 and 2007-2010 NHANES. The difference between cohorts was statistically significant for prevalence of hypertension ($P < .001$), hypercholesterolemia ($P < .001$), diabetes ($P = .003$), and obesity ($P < .001$). Obesity is defined as the proportion of individuals who exceeded a body mass index of 30 (calculated as weight in kilograms divided by height in meters squared). NHANES indicates National Health and Nutrition Examination Survey.

Trajectory for Americans' health is going in the wrong direction.

Inactivity

Persons Aged 46-64 (NHANES) “No Regular Physical Activity”

1988-1994
17%

2007-2010
52%

RESEARCH LETTER

ONLINE FIRST

The Status of Baby Boomers' Health in the United States: The Healthiest Generation?

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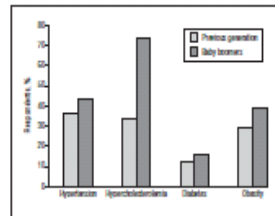


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*Prevalence of
and Trends in
Diabetes Among
Adults in the
United States,
1988-2012*



Andy Menke; Sarah Casagrande; Linda Geiss, Catherin Cowie
JAMA. 2015;314(10):1021 doi:10.1001/jama.2015.10029

Diabetes Prevalence NHANES

(using Hemoglobin A_{1c} , FPG)

Sample of US Population

All Age Groups, Races, Income and Education

1988-1994

9.8%

2000-2002

10.8%

2011-2012

12.4%

For Prediabetes

36.5%

We are all at risk of Type 2 Diabetes: The Best Preventive and Treatment Is...

3234 people with Pre-Diabetes
walked or exercised five times a
week for 30 minutes for six
months

Lost 5% to 7% of their body
weight

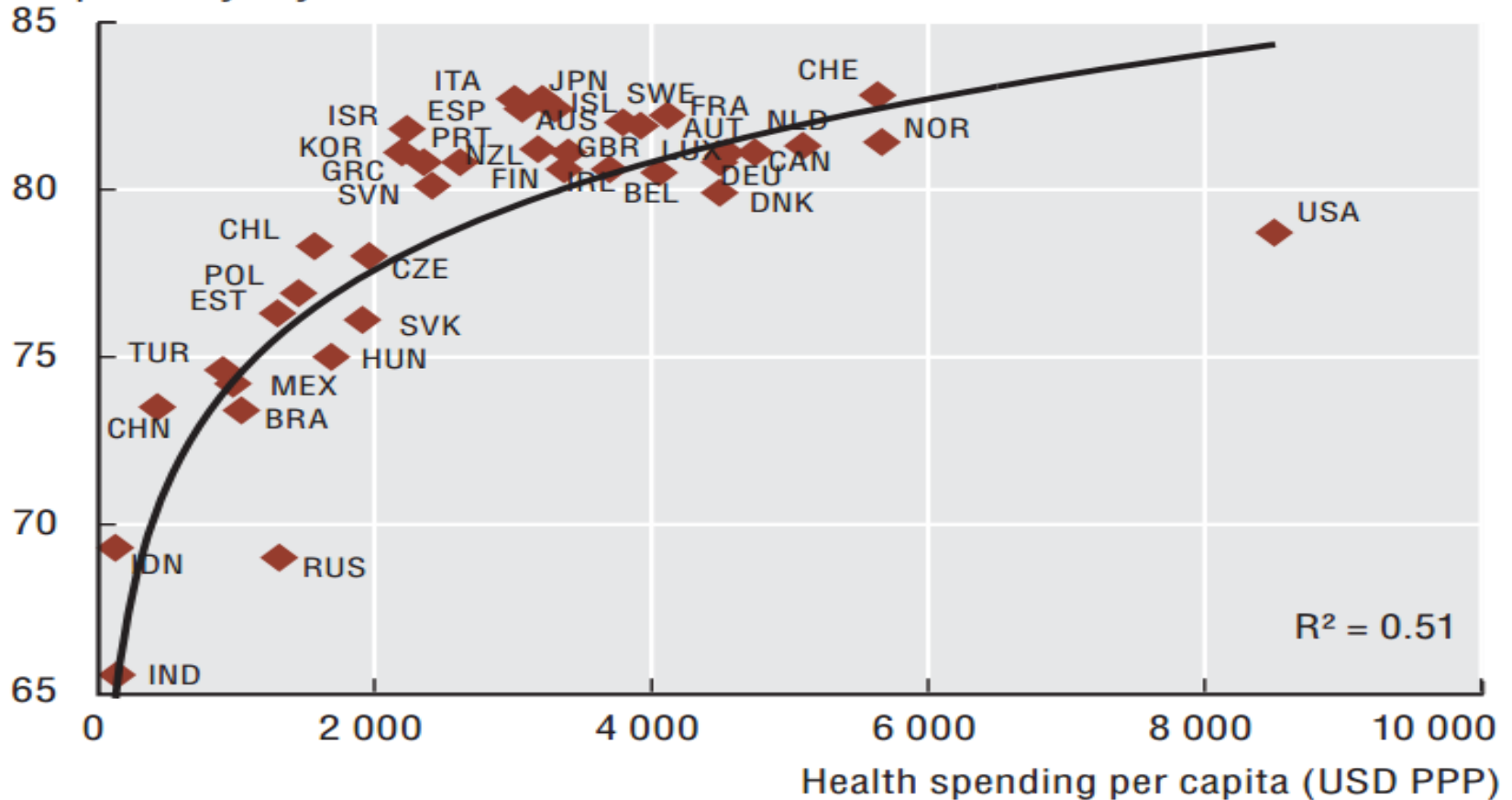
Reduced their risk of diabetes
by 58%



Walking

Life Expectancy at Birth and Health Spending 2011

Life expectancy in years



*Le secret des grandes fortunes sans cause apparente est un crime oublié,
parce qu'il a été proprement fait.*

HONORE DE BALZAC 1834

THE SEVEN DEADLY SINS

Phyllis A. Tickle

Greed



--greed as the 'mother and matrix, root and consort' of all sins.

--“The most insidious and least obvious of offenses”...transformed from a specific offense against godliness to a brutal but amoral force of society”

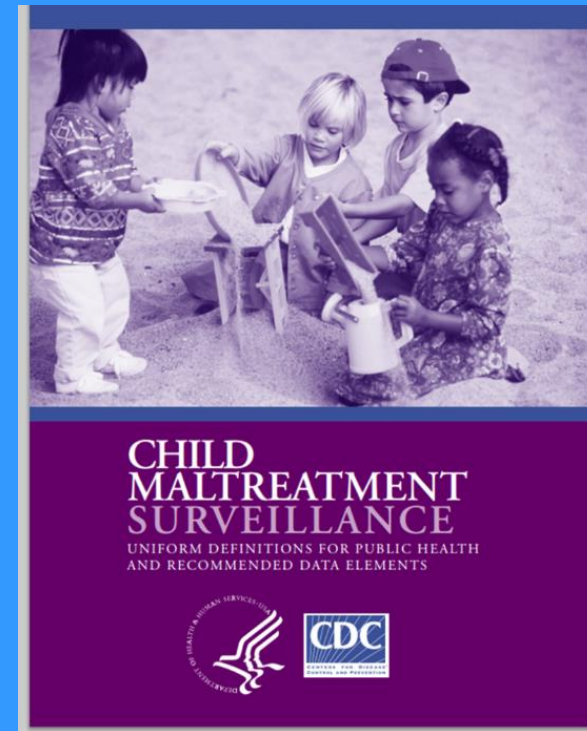
Acts of Commission (Child Abuse)

Words or overt actions that cause harm, potential harm, or threat of harm to a child. Acts of commission are deliberate and intentional; however, harm to a child may or may not be the intended consequence. Intentionality only applies to the caregivers' acts-not the consequences of those acts. For example, a caregiver may intend to hit a child as punishment (i.e., hitting the child is not accidental or unintentional) but not intend to cause the child to have a concussion. The following types of maltreatment involve acts of commission:

Is this Generational Child Abuse?

Child Abuse (Acts of commission)

“Actions that cause harm or threat of harm to a child. These actions are deliberate... harm to a child may not be the intended consequence”



Child Neglect...harm to a child may not be the intended consequence.

Acts of Omission (Child Neglect)

The failure to provide for a child's basic physical, emotional, or educational needs or to protect a child from harm or potential harm. Like acts of commission, harm to a child may or may not be the intended consequence. The following types of maltreatment involve acts of omission:

- Failure to provide
 - Physical neglect
 - Emotional neglect
 - Medical/dental neglect
 - Educational neglect
- Failure to supervise
 - Inadequate supervision
 - Exposure to violent environments



**CHILD
MALTREATMENT
SURVEILLANCE**
UNIFORM DEFINITIONS FOR PUBLIC HEALTH
AND RECOMMENDED DATA ELEMENTS



Joseph E Stiglitz

2001 Nobel Laureate in Economics

“I wish it were the case that America was the land of opportunity, but we have become one of ...the advanced countries with the least opportunity.

In the United States, the life chances of young people are more dependent on the income and education of their parents than in almost any other advanced country.”

Expenditure Cascades

By

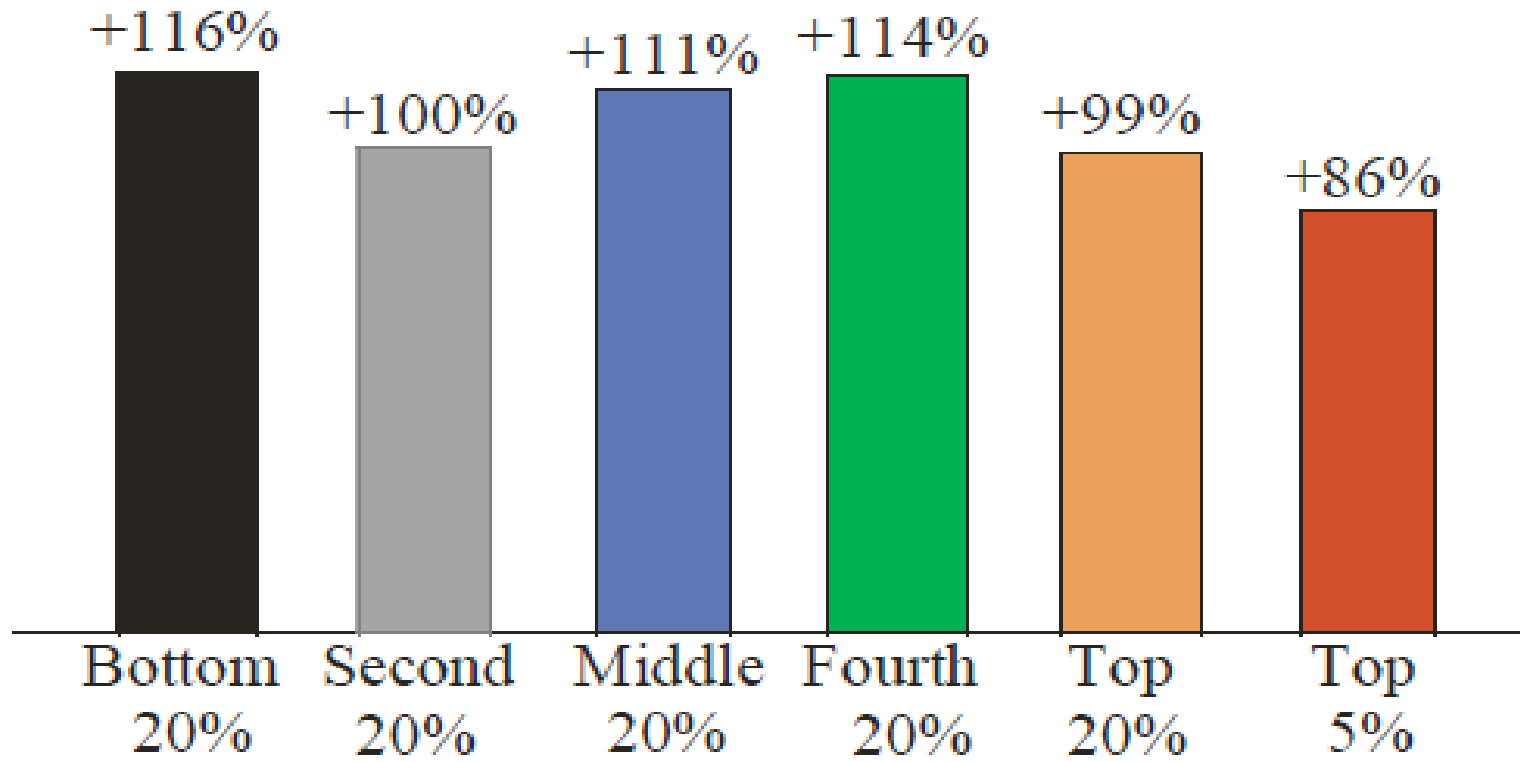
Robert H. Frank,¹ Adam Seth Levine,² and Oege Dijk³

¹ Cornell University, Johnson Graduate School of Management, Ithaca, NY 14853

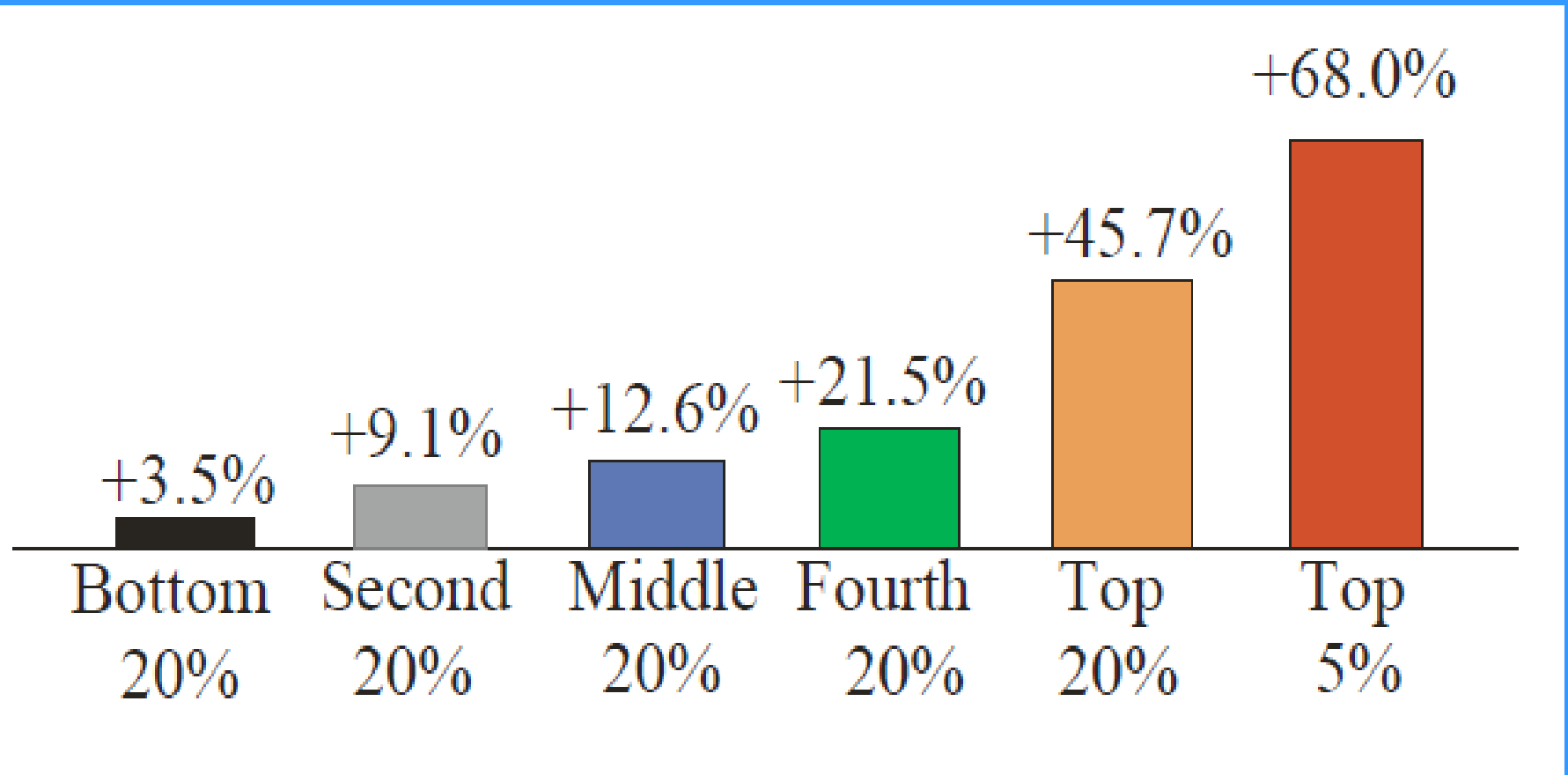
² University of Michigan, Department of Political Science, Ann Arbor, MI 48109

³ European University Institute, Department of Economics, Fiesole, Italy 50014

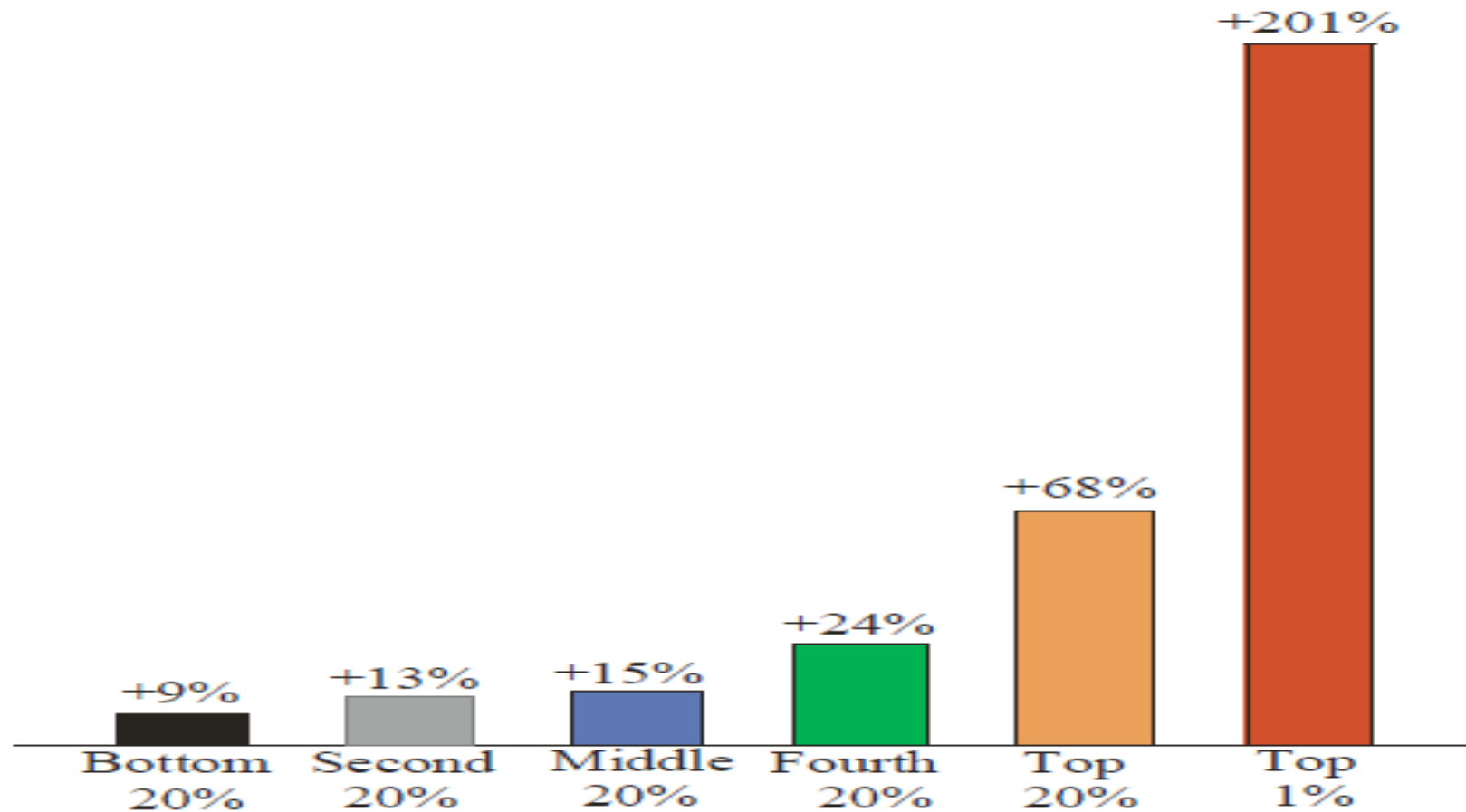
Changes in Before Tax US Household Incomes 1949-1979



Changes in Before Tax US Household Incomes 1979-2003



Changes In After-Tax US Household Income 1979-2000



House Clears Path for Repeal of Health Law

By THOMAS KAPLAN and ROBERT PEAR JAN. 13, 2017



House members left the Capitol after morning votes on Friday in Washington. Al Drago/The New York Times

Opinions

America's concern for the poor is about to be tested



Protesters show their support for the Affordable Care Act. (Andrew Herrer/Bloomberg)

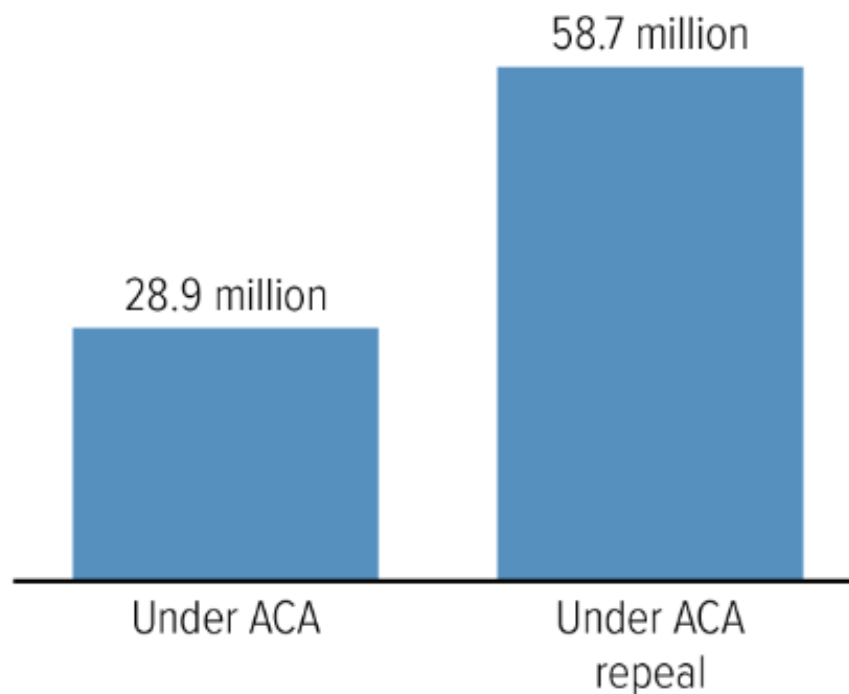
By Robert Greenstein December 26, 2016

SHARE



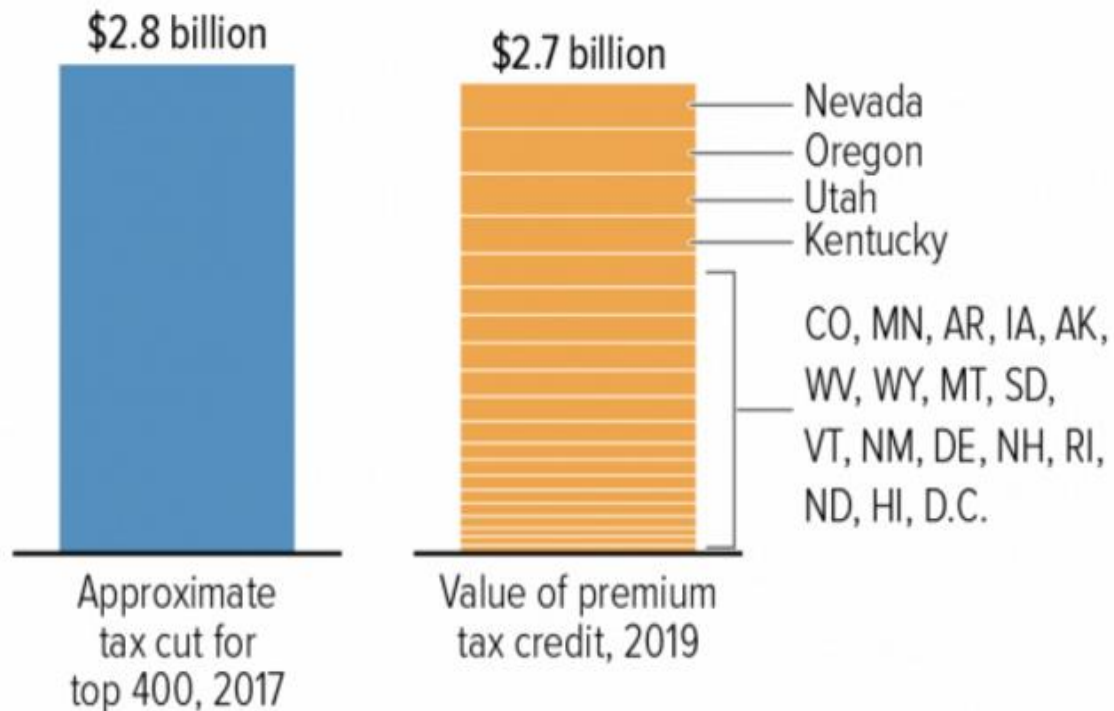
Repealing Affordable Care Act (ACA) Would Double Number of Uninsured

Number of uninsured in 2019



Source: Urban Institute, "Implications of Partial Repeal of the ACA through Reconciliation"

With ACA Repeal, Top 400 Households Get Tax Cuts Worth More than Premium Tax Credits For 800,000 People in 20 States and D.C.

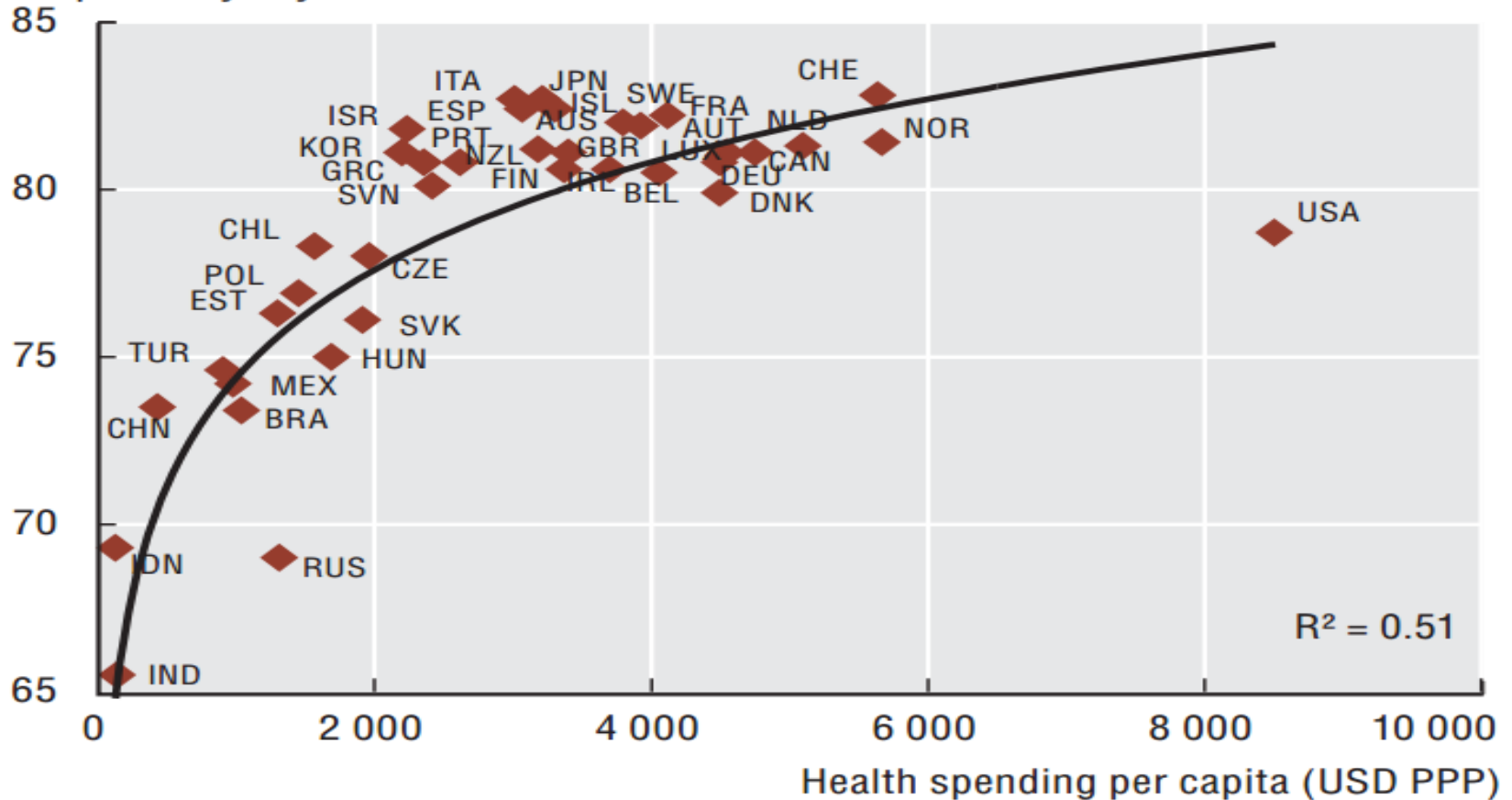


Note: ACA = Affordable Care Act. Top 400 refers to the top 400 highest-income households. Estimates based on the Republican bill to repeal the ACA vetoed by President Obama in January 2016 that would eliminate two Medicare taxes that only high-income filers pay and also eliminate premium tax credits that help low- and moderate-income families buy health coverage through the marketplace. The premium tax credits shown are for the 20 smallest states by value of the tax credits and for Washington, D.C.

Source: CBPP calculations based on Internal Revenue Service Statistics of Income and Urban Institute data.

Life Expectancy at Birth and Health Spending 2011

Life expectancy in years





Martin Shkreli is the founder and chief executive of Turing Pharmaceuticals, which raised the price of the drug Daraprim to \$750 a tablet from \$13.50.

Paul Taggart/Bloomberg, via Getty Images

Drug Goes From \$13.50 a Tablet to \$750, Overnight

By ANDREW POLLACK SEPT. 20, 2015

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Specialists in infectious disease are protesting a gigantic overnight increase in the price of a 62-year-old drug that is the standard of care for treating a life-threatening parasitic infection.

The drug, called Daraprim, was acquired in August by Turing Pharmaceuticals, a start-up run by a former hedge fund manager. Turing immediately raised the price to \$750 a tablet from \$13.50, bringing the annual cost of treatment for some patients to hundreds of thousands of dollars.

SUSTAINABILITY

Exxon Knew about Climate Change almost 40 years ago

A new investigation shows the oil company understood the science before it became a public issue and spent millions to promote misinformation

By Shannon Hall on October 26, 2015  24 [Véalo en español](#)

“...investigation shows the oil company understood the science... and spent millions to promote misinformation”



The company's knowledge of climate change dates back to July 1977, when its senior scientist, James Black delivered a sobering message on the topic. Credit: Getty Images/MAES

Exxon was aware of climate change, as early as 1977, 11 years before it became a public issue, according to a recent investigation from InsideClimate News. This knowledge did not prevent the company (now ExxonMobil and the world's largest oil and gas company) from spending decades refusing to publicly acknowledge climate change and even promoting climate misinformation—an approach many have likened to

Deeper Ties to Corporate Cash for Doubtful Climate Researcher



Wei-Hock Soon of the Harvard-Smithsonian Center for Astrophysics, whose articles have been tied to corporate

“Over the last 14 years Willie Soon, a researcher at the Harvard-Smithsonian Centre for Astrophysics, received a total of \$1.25m from Exxon Mobil, Southern Company, the American Petroleum Institute (API) and a foundation run by the ultra-conservative Koch brothers, the documents obtained by Greenpeace through freedom of information filings show.”



QUADRENNIAL DEFENSE REVIEW 2014





SecurityAndClimate.cna.org

**NATIONAL SECURITY
AND THE THREAT OF
CLIMATE CHANGE**

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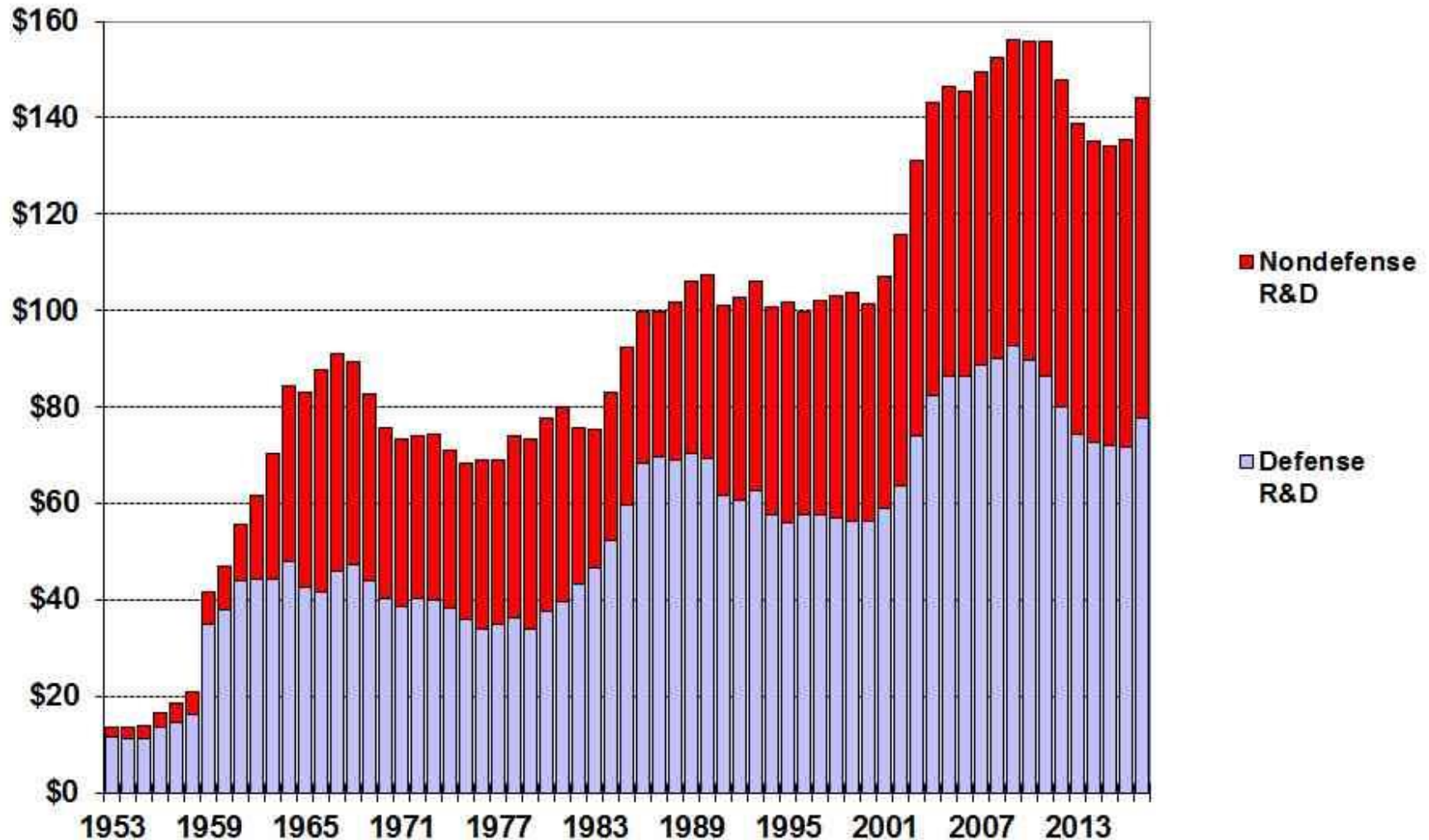
Former Commander-in-Chief of U.S. Central Command (CENTCOM)

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*Executive Director, Military Advisory Board
The CNA Corporation*

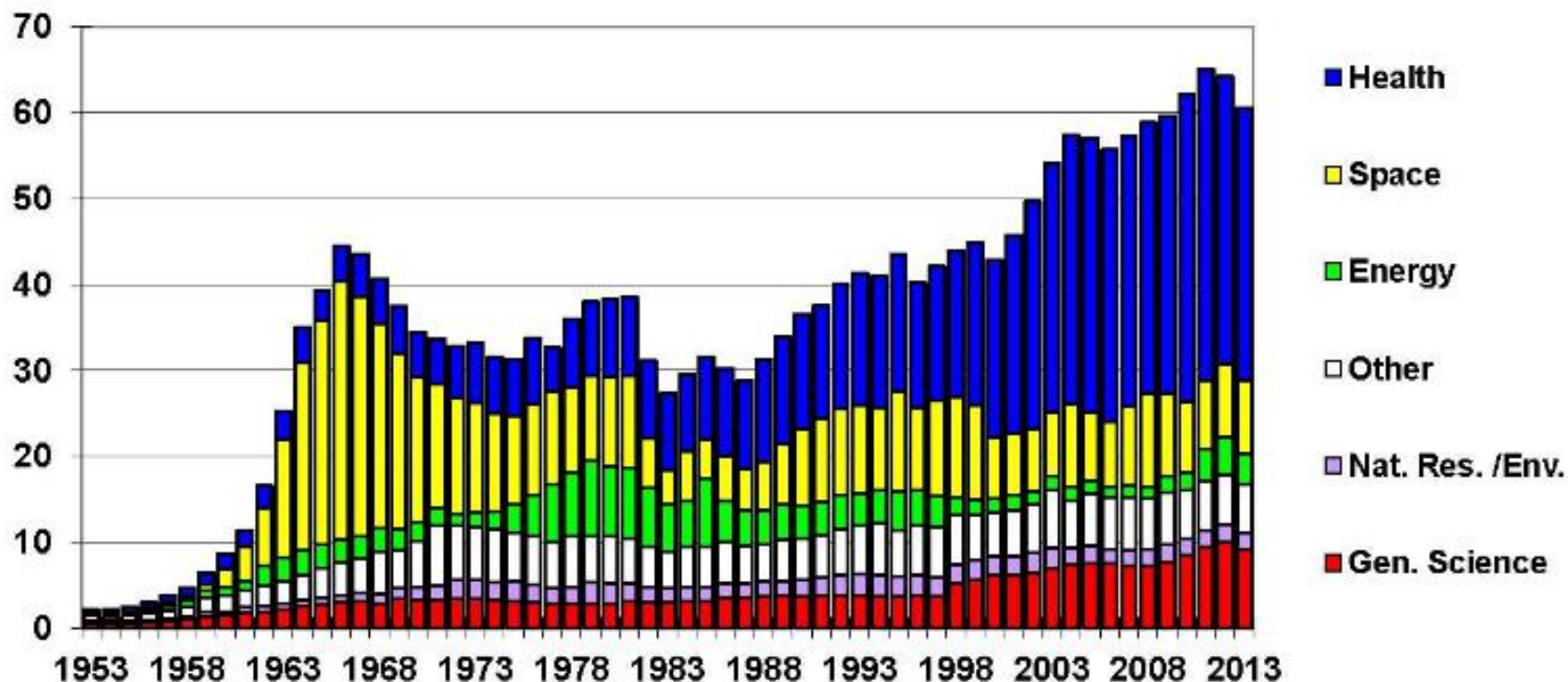
Federal Spending on Defense and Nondefense R&D

Outlays for the conduct of R&D, billions of FY 2016 dollars



Trends in Nondefense R&D by Function

outlays for the conduct of R&D, billions of constant FY 2012 dollars



Source: AAAS, based on OMB Historical Tables in *Budget of the United States Government FY 2013*. FY 2013 is the President's request.

Note: Some Energy programs shifted to General Science beginning in FY 1998.

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Vision Zero Hawaii

Pedestrians and cyclists share similar interests as vulnerable users. Streets safe for pedestrians are also streets safer for cyclists. 'Vision Zero' is a vision that aims to achieve zero traffic fatalities and serious injuries. To chip away at this goal, the Hawaii Cycling League holds Solutions Meetings, Memorial Rides, and Sign Waving events to honor the person, remind everyone that we each have a responsibility, and to see what education, enforcement, or engineering improvements could prevent future crashes.



Vision Zero

Find out more about Vision Zero Hawaii and the Vision Zero movement around the world!



Solutions Meetings

A meeting held to discuss engineering, education, and enforcement changes that will make the roadway safer for all users. Solutions Meetings are inclusive to all roadway stakeholders, avoid blame, and focus on what can be done in the future to prevent other deaths.



Crash NOT Accident

The vast majority of all fatal and non-fatal injuries in the United States, including traffic injuries, are not acts of fate but are predictable and preventable. Individual responsibility can prevent crashes.



Pedestrian Crossing Flags



Memorial Rides & Sign Waving



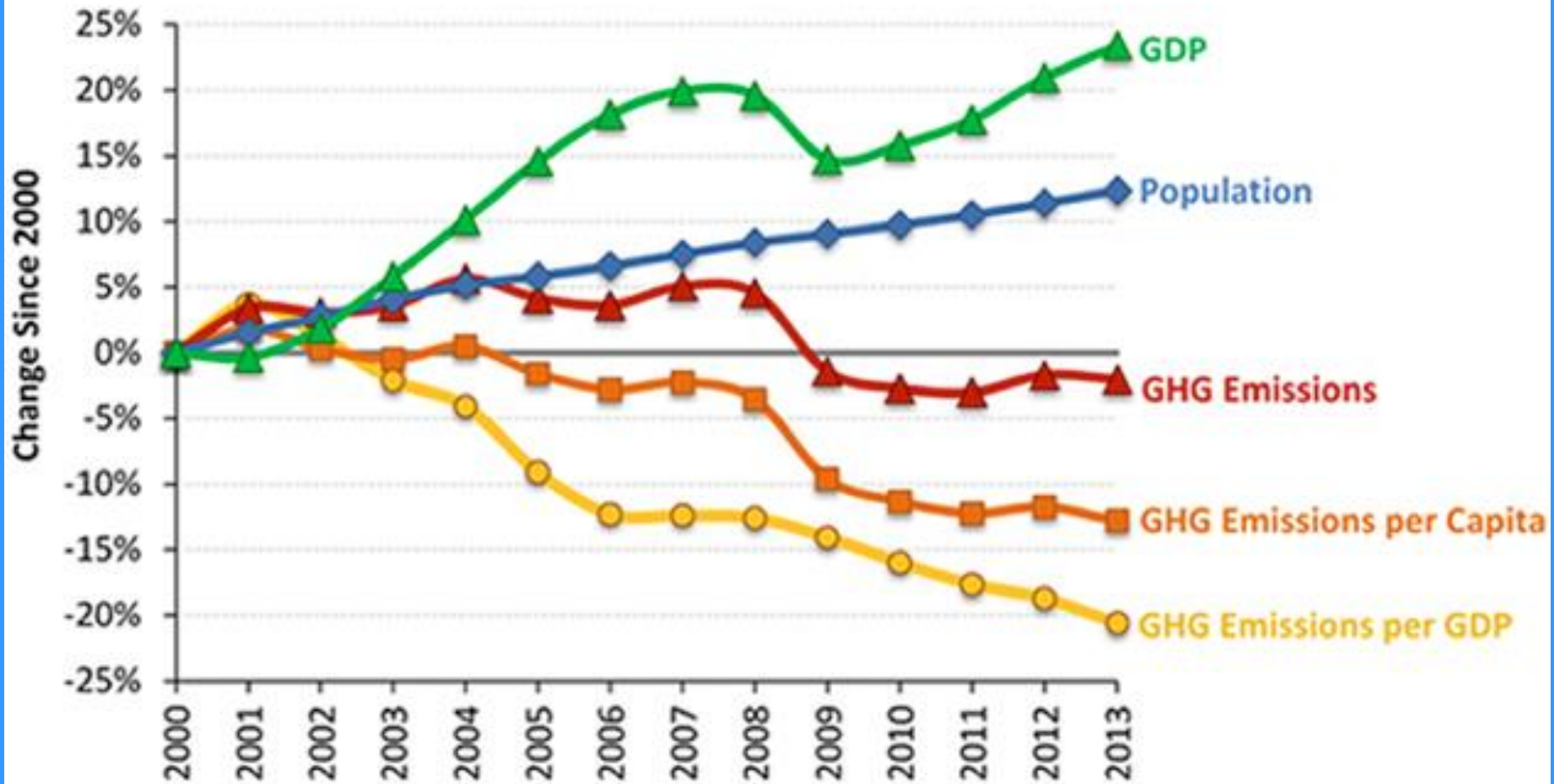
Learn More

East Side: Ke Ala Hele Makalae, Phases 1 - 3



Kauai East Side Bicycle Trail

Change in California GDP, Population and GHG Emissions since 2000





- Via Verde South Bronx NYC Nov, 2013

British Columbia's Carbon Tax

Revenue Neutral

- Implemented July, 2008
- Covers fuel use and carbon emissions.
- 2008: C\$10 per tonne of carbon dioxide
 - Increased by C\$5 p/y.
- In 2014 C\$30 per tonne (\$0.26/gal)
- "Revenue neutral" by law. BC has cut \$760 million more in income and other taxes than needed to offset carbon tax revenue.

Per capita consumption of Petroleum Products

Subject to BC carbon Tax (% change)

Per Capita Consumption of Petroleum Products Subject to the BC Carbon Tax (% change)

	2007/08- 2008/09	2008/09- 2009/10	2009/10- 2010/11	2010/11- 2011/12	2011/12- 2012/13	2007/08- 2012/13
BRITISH COLUMBIA	-3.5%	-6.7%	-1.3%	-6.2%	0.7%	-16.1%
REST OF CANADA	-2.5%	-1.5%	6.8%	-1.7%	2.2%	3.0%
DIFFERENCE	-1.0%	-5.2%	-8.1%	-4.5%	-1.5%	-19.1%

Source: Statistics Canada, Author Calculations

2007-2012

British Columbia -16.1%

Rest of Canada +3%

Symposium:
Alternative U.S. Climate Policy Instruments

Designing a Carbon Tax to Reduce U.S. Greenhouse Gas Emissions

Gilbert E. Metcalf*

Introduction

Public sentiment and political opinion have recently shifted dramatically in favor of the United States taking action on climate change. As illustration, the Democratic and Republican nominees for presidency last year supported imposing limits on U.S. carbon emissions. This would complement European actions on carbon emissions through the European Union's (EU) Emission Trading Scheme (ETS), which recently finished the first year of its second phase of emission limits. With the United States poised to take the major policy step of initiating limits on carbon emissions, this article, which is part of a broader symposium on Alternative U.S. Climate Policy Instruments,¹ makes the economic and political case for using a carbon tax as the policy instrument for curtailing domestic greenhouse gas (GHG) emissions.

Conventional wisdom holds that a carbon tax is not a politically viable option for controlling carbon emissions because the tax makes overly explicit the costs associated with

Social Cost Estimates for CO₂ Marginal Damages Per Metric Ton

- IPCC II ~\$12 (\$3-95)
- Stern (2007) \$85
- MIT \$18 (going up by 4%/year)

Short-run Fossil Fuel Costs with a Carbon Tax of \$15/ton CO₂e

Would add to:

Gasoline: 13 cents/ gallon

Natural Gas: 54 cents/ 1000 ft³

Short-run Emissions Reductions with a Carbon Tax of \$15/ton CO₂e

Coal	14.7%
Petroleum Products	5.6%
Natural Gas	3.4%

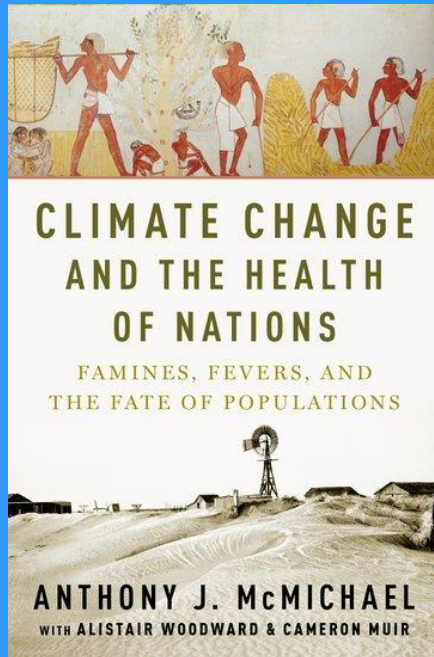
Would generate about \$90billion per year
About \$560/per American

Children's Environmental Health

Built Environment, Climate Change and Governance

Honolulu, Hawaii

March 11, 2017



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