America's Climate Choices versus Americans' Attitudes and Understanding

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First, a little background info about me

NOAA is mandated by Congress to deliver climate services to society

- National Weather Service Organic Act of 1890
- Marine Mammal Protection Act of 1972
- National Marine Sanctuaries Act of 1972
- Coastal Zone Management Act of 1972
- Endangered Species Act of 1973
- Magnuson-Stevens Fishery Conservation & Management Act of 1976 (Amended 1996)
- National Climate Program Act of 1978
- Global Change Research Act of 1990
- Hydrographic Services Improvement Act of 1998
- Coral Reef Conservation Act of 2000
- National Integrated Drought Information Services Act of 2006
- America Competes Act of 2007

Presentation overview

I. Brief recap of state of the climate today

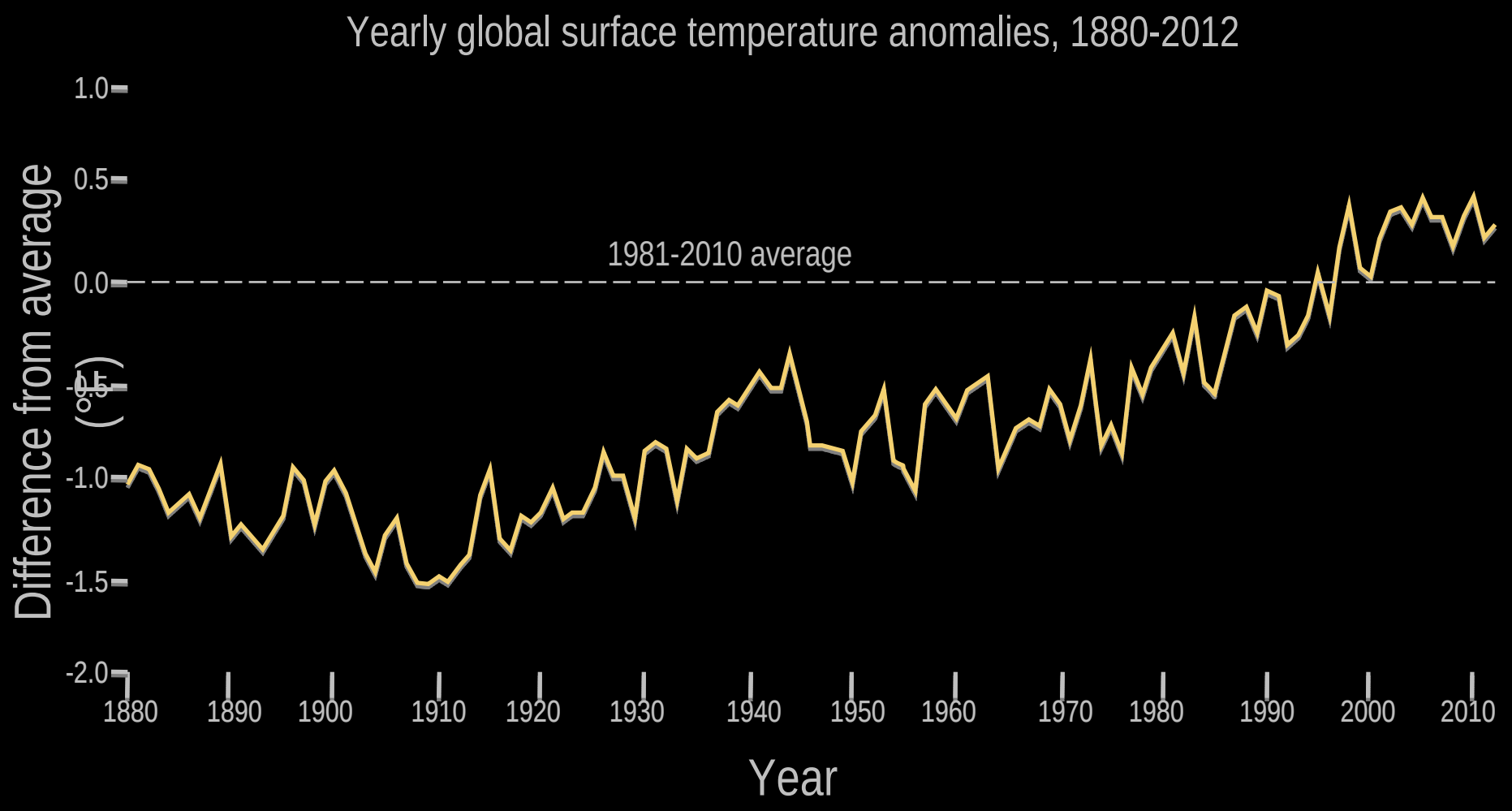
I. “America’s Climate Choices” reports

I. Lessons learned from social science

- Can we improve public science literacy?
- Global warming’s 6 Americas
- Cultural cognition and the roots of denialism

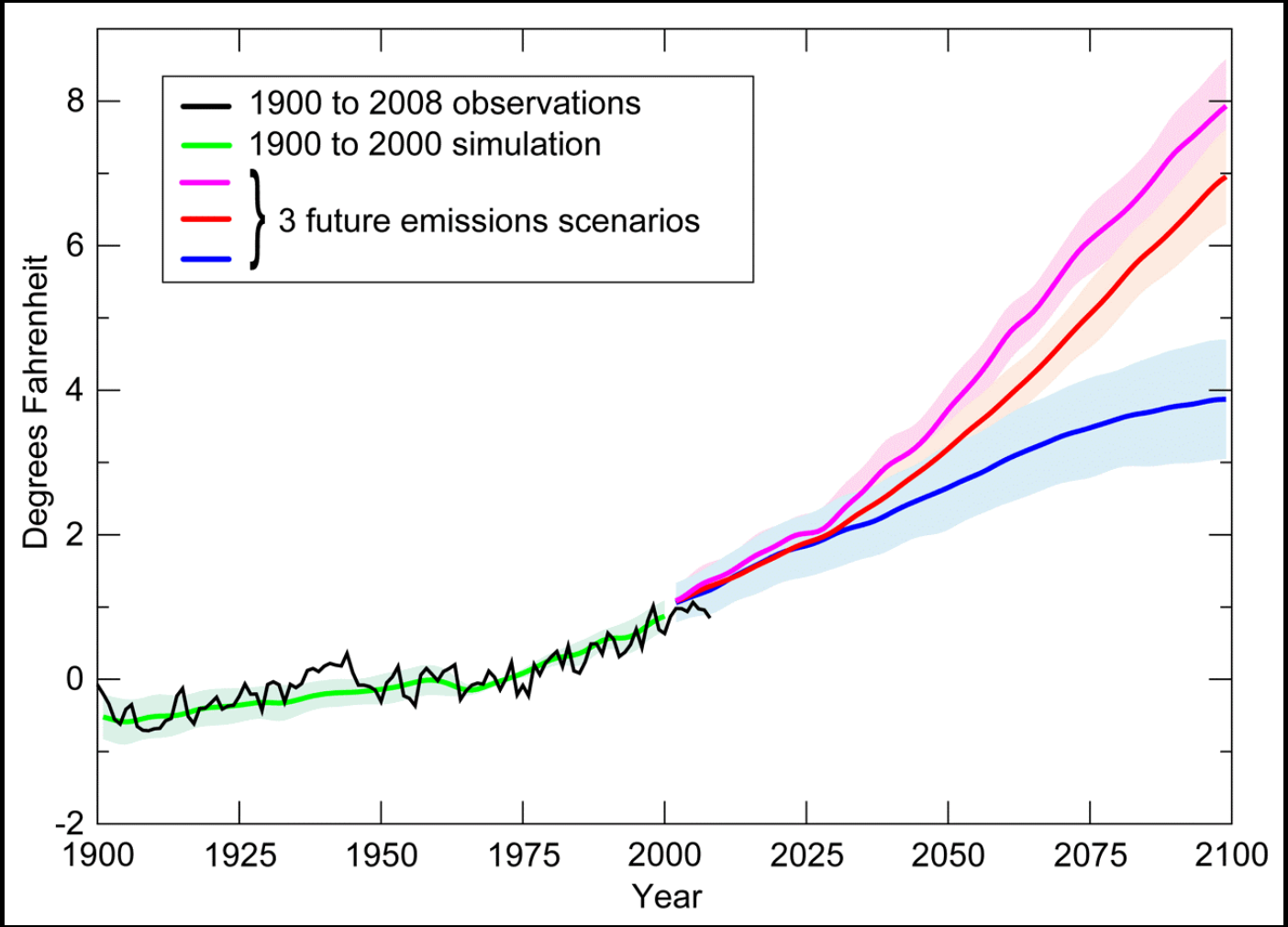
IV. Discussion questions

Globally averaged annual temperature has risen by 1.3°F since 1880



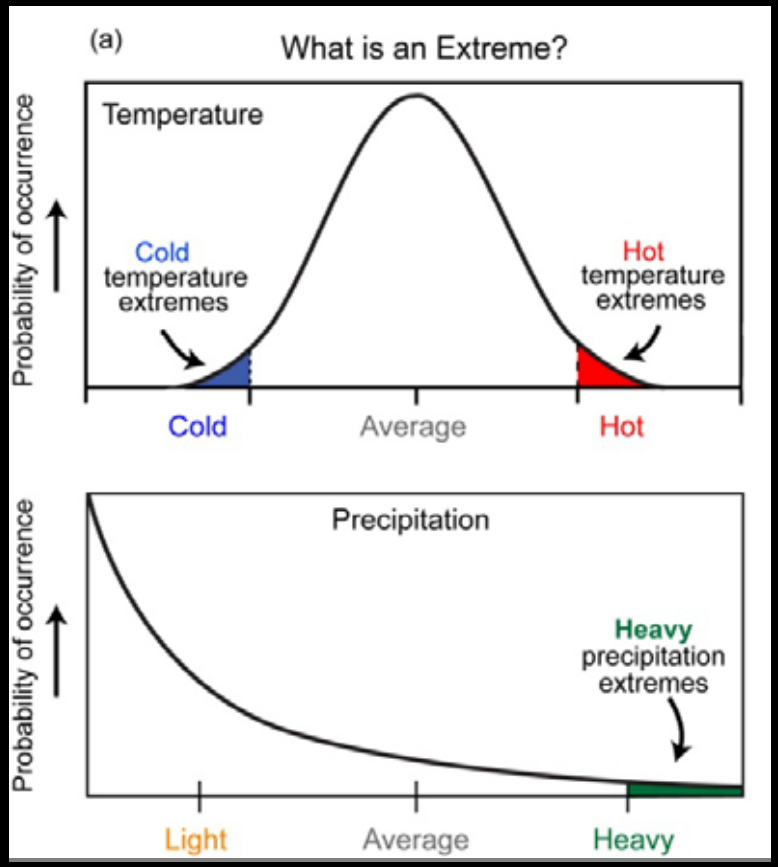
Scientists project another 2 to 9°F (1.1 to 5.4°C) global warming by 2100 due mainly to GHGs

Projected Global Average Temperature, 1900 to 2100



What is an ‘extreme event’?

An ‘extreme event’ is a time and place in which weather, climate or environmental conditions — such as temperature, precipitation, prolonged drought, or coastal flooding — rank among the highest or lowest of historical measurements.



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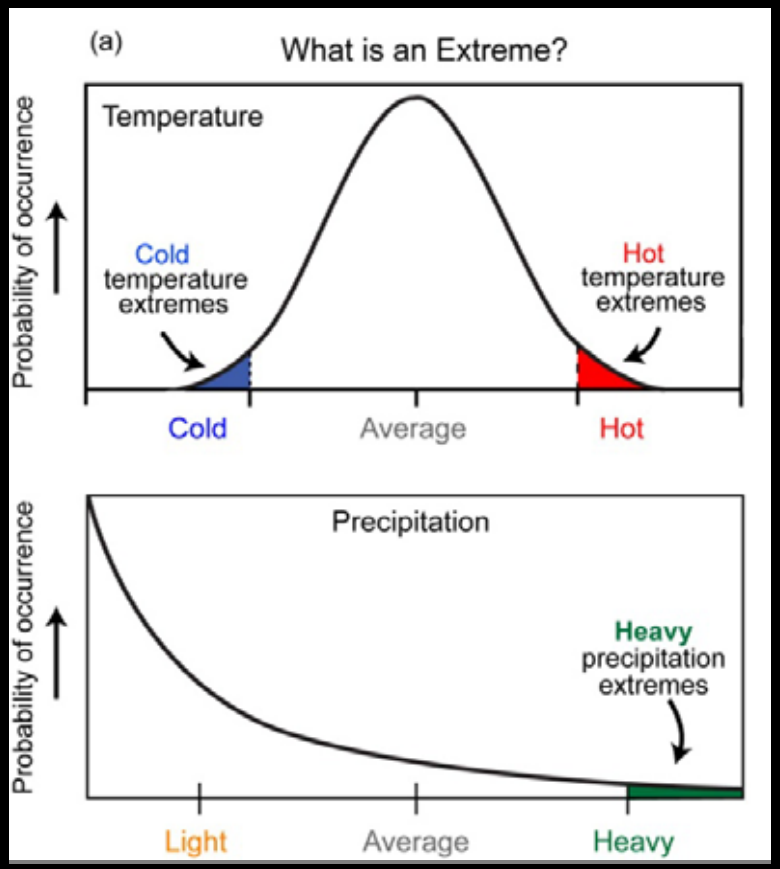
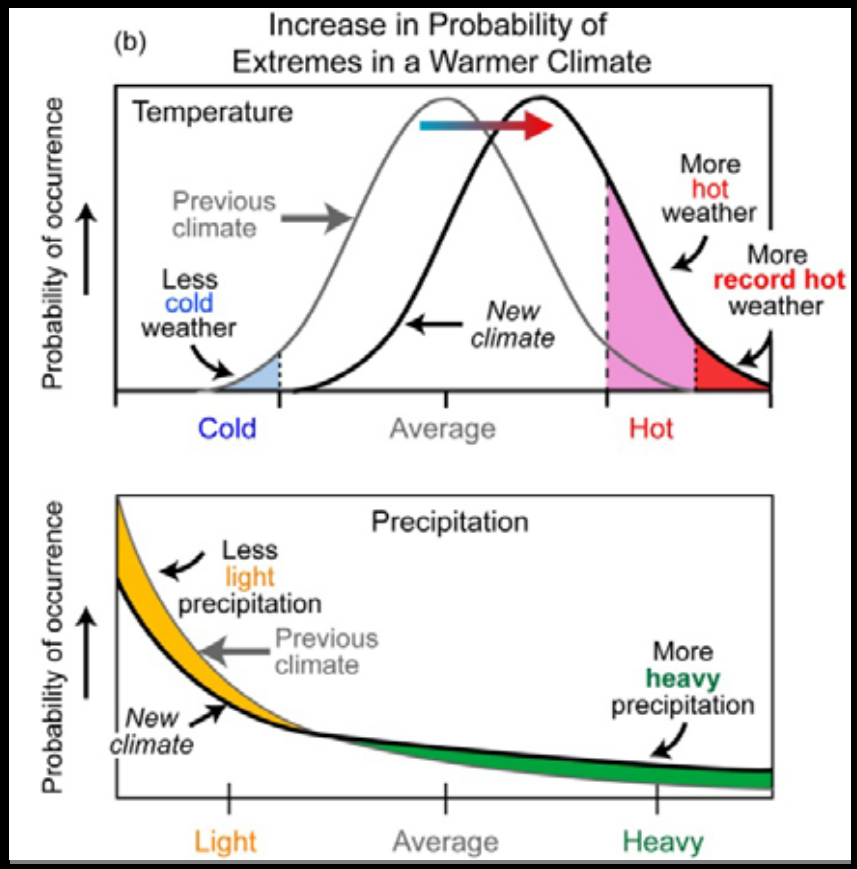


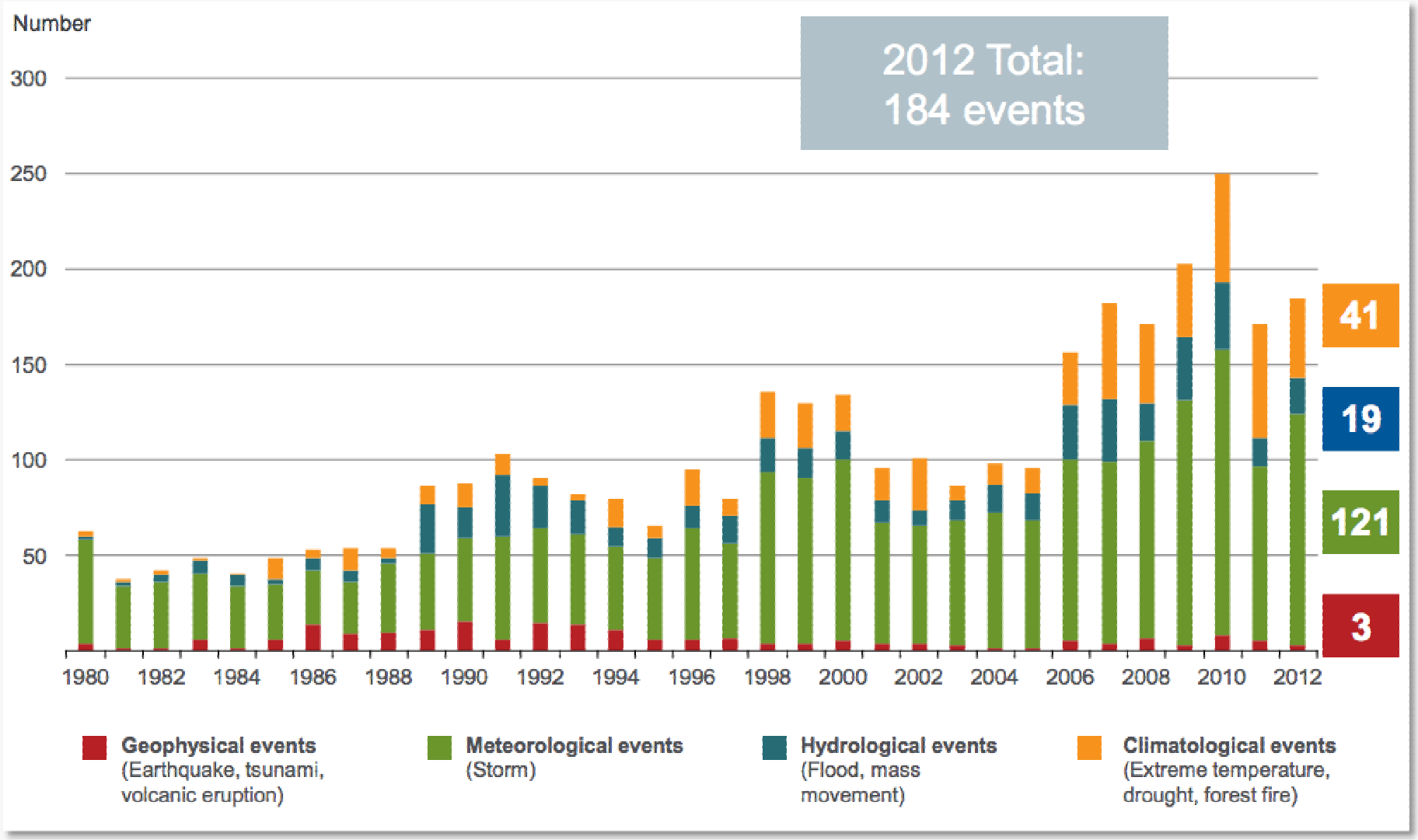


US Natural Catastrophe Update

Natural Catastrophes in the USA 1980 – 2012

Number of events

Munich RE



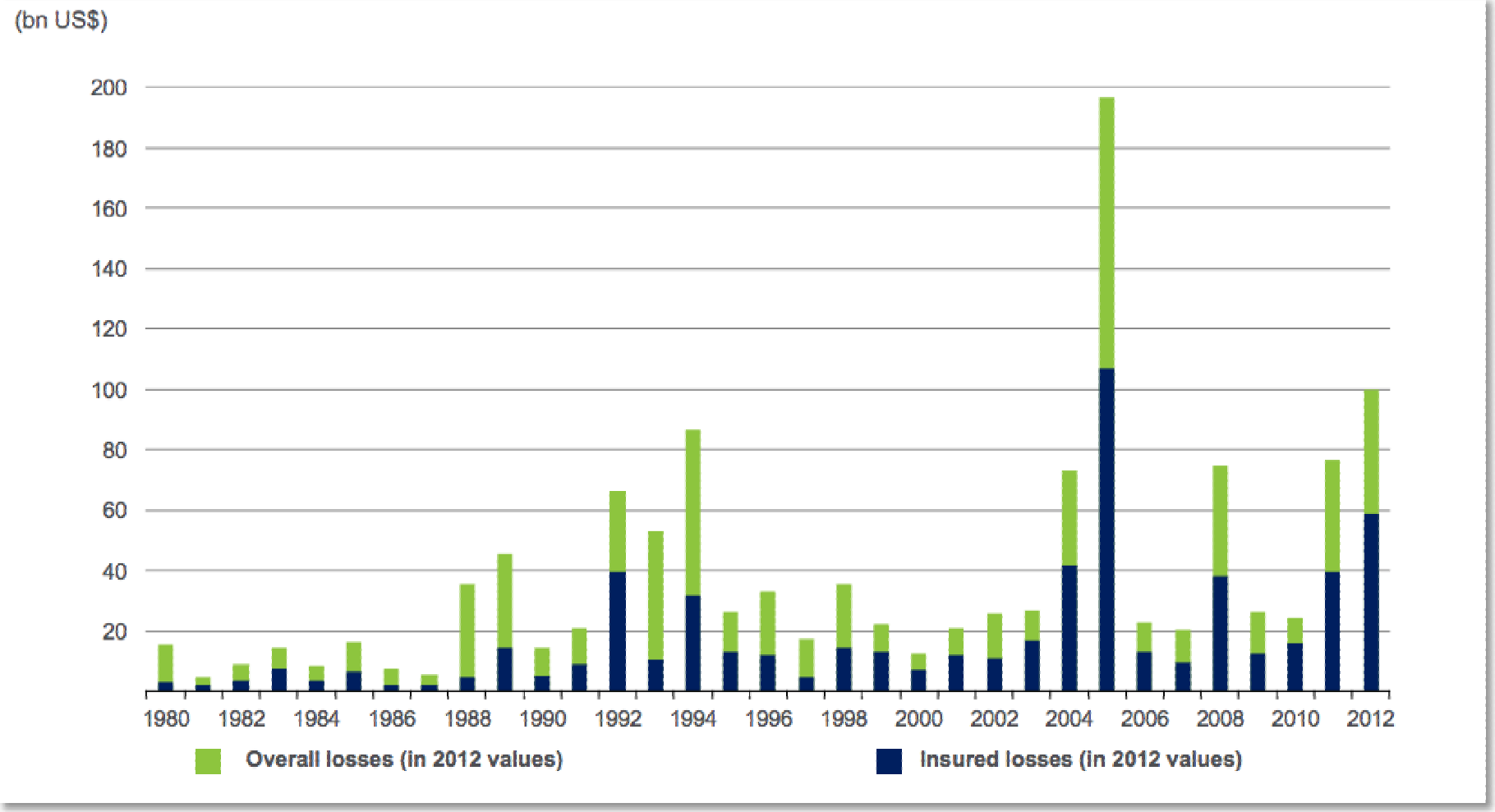
US Natural Catastrophe Update

Natural catastrophes in the USA 1980 – 2012

Overall and insured losses

Munich RE

Insured losses in the U.S. In 2012 were the second highest on record.




sample movie

Part II:

America's Climate Choices

Report series by the U.S. National Academy of Science

http://nas-sites.org/americasclimatechoices

1. Advancing the Science of Climate Change
2. Limiting the Magnitude of Climate Change
3. Adapting to the Impacts of Climate Change
4. Informing an Effective Response to Climate Change
5. America's Climate Choices

Two types of response strategies

Mitigation – limiting the magnitude of global warming by reducing emissions of heat-trapping gases, or removing them from the atmosphere.

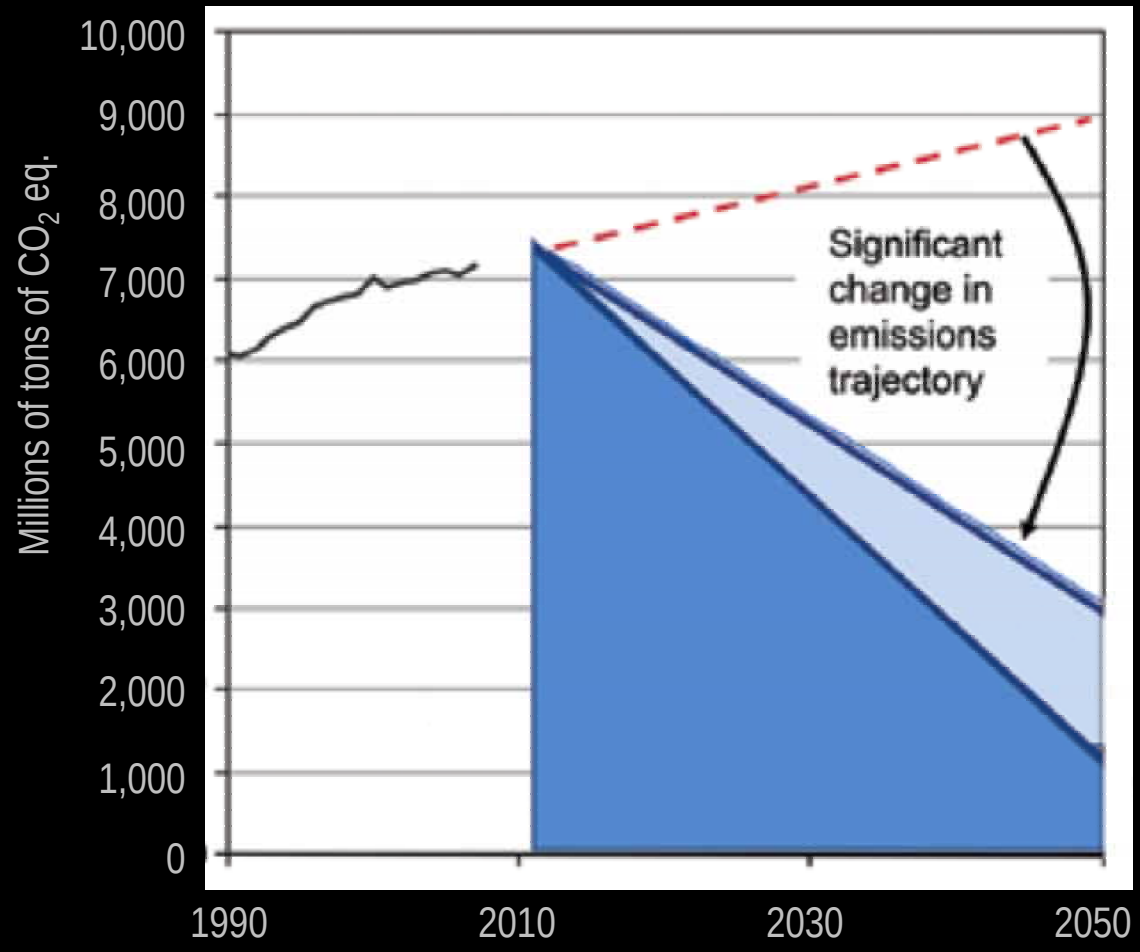
Adaptation – actions to improve our ability to cope with or avoid harmful climate-related impacts, or to take advantage of newly favorable conditions

Both will be needed.

“Meeting internationally discussed targets for limiting atmospheric greenhouse gas concentrations and associated increases in global average temperatures will require a major departure from business as usual in how the world uses and produces energy.”

—NAS, *America’s Climate Choices*

Set a goal to reduce CO_2 emission to 170 gigatons by 2050



*SOURCE: U.S. National Academy of Sciences

Opportunities for reducing emissions:

» Reduce underlying demand for goods & services that require energy thru education & incentive programs to influence consumer behavior & preferences; curtail housing 'sprawl'

» Improve energy efficiency thru better insulation, more efficient appliances and lights, more fuel-efficient cars, etc.

» Expand use of low- and zero-carbon energy sources by switching from coal and oil to natural gas, nuclear, wind, solar, geothermal, and biomass sources. Capture & sequester carbon at the source.

» Capture and sequester carbon directly from the atmosphere thru managed forests & soils, and thru mechanical methods.

*SOURCE: U.S. National Academy of Sciences

Mitigation: limiting the magnitude of global warming

NAS recommendations:

» Adopt an economy-wide carbon pricing system, through cap-and-trade, or taxes, or some hybrid of the two

» Complement the carbon pricing system with other initiatives, such as R&D incentives into alternative energy sources and incentives to retire or retrofit older systems

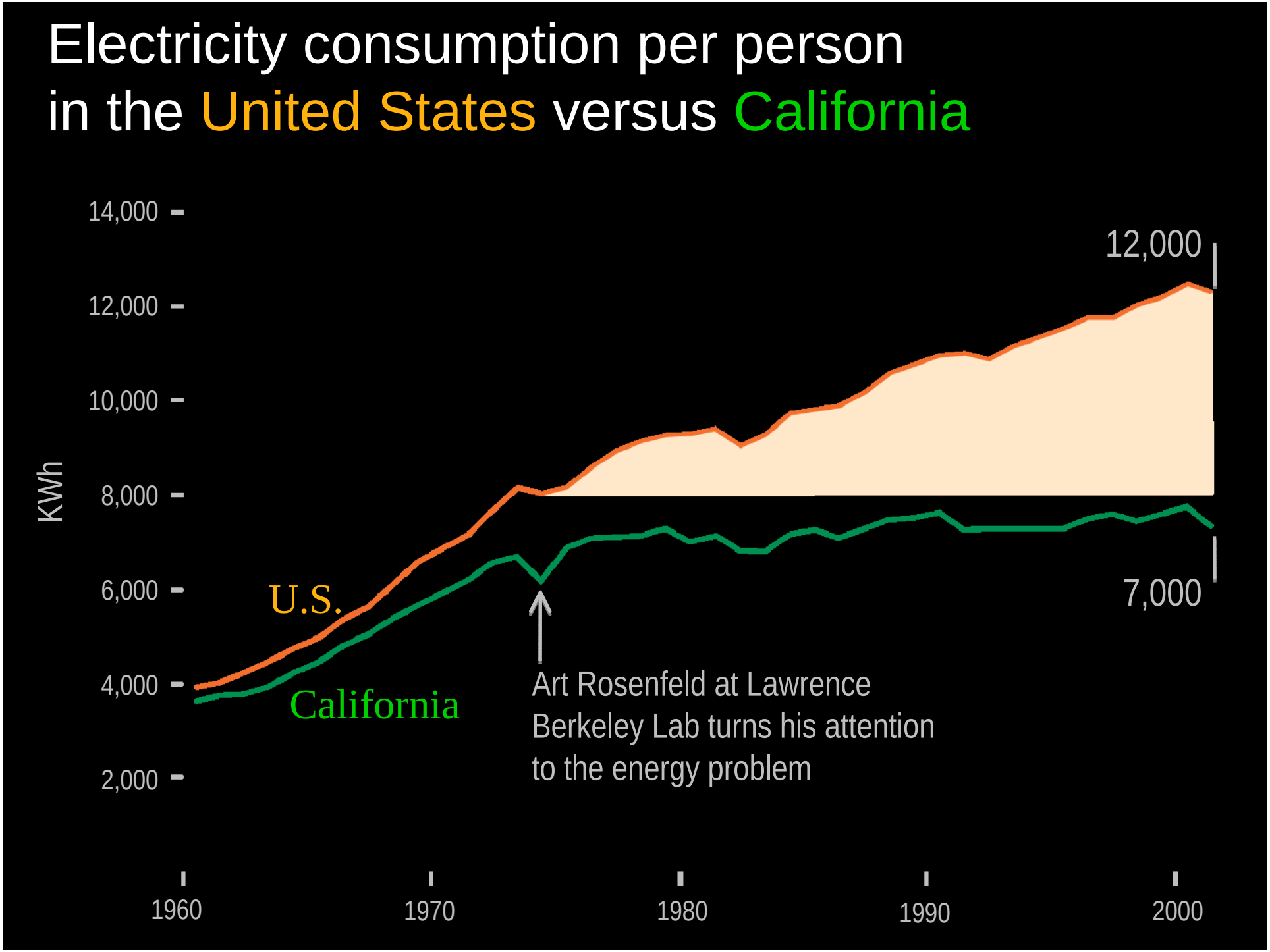
» Create new technology choices by investing in R&D to stimulate innovation

» Consider potential equity implications when developing policies and technologies to give entrée to disadvantaged populations

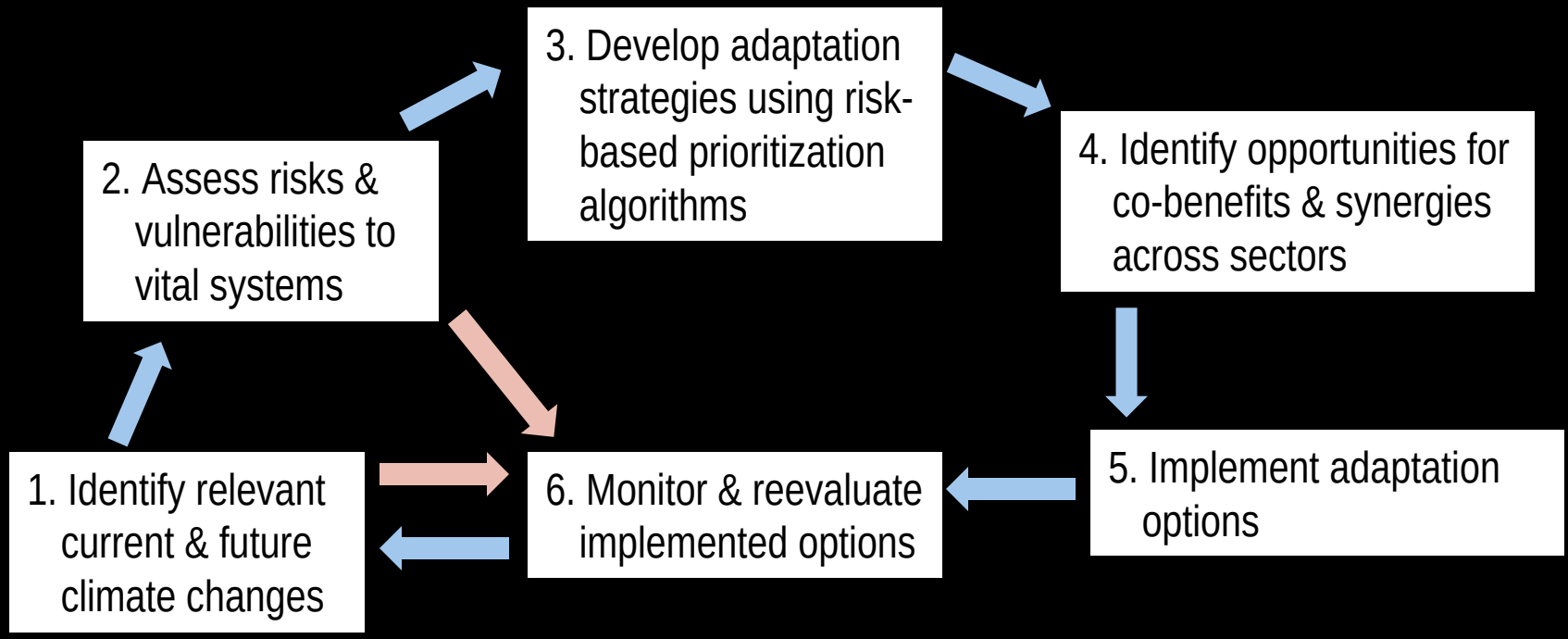
» Establish the U.S. as a world leader in these initiatives; allow for flexibility and experimentation at local, state and regional levels

*SOURCE: U.S. National Academy of Sciences

Electricity consumption per person in the United States versus California



Adaptation: reducing vulnerabilities, coping with impacts, & exploiting opportunities



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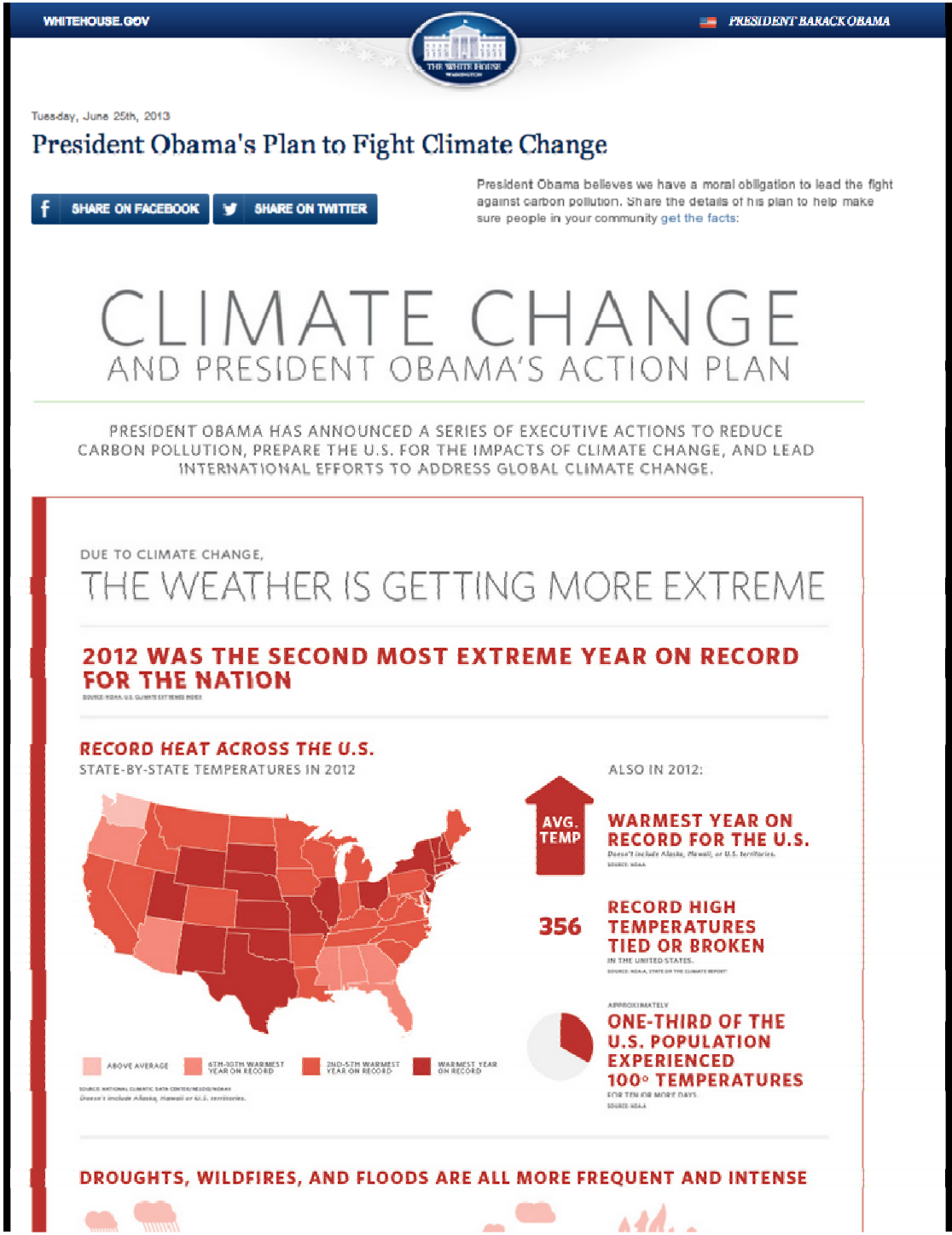

The President's 2013 Climate Action Plan

www.whitehouse.gov/share/climate-action-plan

Part III:

Lessons learned from social science

"We often can't just 'educate' our way out of science-society tension. The problem is not just lack of under-standing. People do understand much of what we're saying or want to do. They don't like it. The conflict with their core values trumps their view of societal benefits."

— Alan Leshner

AAAS CEO and *Science* Publisher

Pew Research: Americans' priorities in 2013

Priority Items	2009	2012	2013	4-yr △
1.Strengthening economy	85%	86%	86%	+1
2.Improving job situation	82%	82%	79%	-3
3.Reducing budget deficit	53%	69%	72%	+19
4.Defending against terrorism 76%	69%	71%	-5	
5.Making Social Security sound 63%	68%	70%	+7	
6.Improving education	61%	65%	70%	+9
7.Making Medicare financially sound	60%	61%	65%	+5
8.Reducing health care costs	59%	60%	63%	+4
9.Helping the poor and needy 50%	52%	57%	+7	
10.Reducing crime	46%	48%	55%	+9
11.Reforming tax system	--	--	52%	--
12.Protecting the environment 41%	43%	52%	+11	
13.Dealing with the energy problem	60%	52%	45%	-15
14.Reducing influence of lobbyists	36%	40%	44%	+8
15.Strengthening the military	44%	39%	41%	-3
16.Dealing with moral breakdown	45%	44%	40%	-5
17.Dealing with illegal immigration	41%	39%	39%	-2
18.Strengthening gun laws	--	--	37%	--
19.Dealing with global trade	31%	38%	31%	0
20.Improving infrastructure	--	30%	30%	--
21.Dealing with global warming	30%	25%	28%	-2

Win-win opportunities to 'connect the dots'

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What Obama said in June…* (to paraphrase)

1. Earth is warming with resulting climate changes.
2. Human emission of heat-trapping gases — mainly carbon dioxide — is the main reason Earth is warming.
3. There have been, are, and will be harmful consequences for the economy, human health and welfare, and the environment.
4. The science is settled—97% of climate scientists are in agreement with those first 3 statements.
5. We can and must pursue win-win strategies in which we address the root causes of global warming ***and*** grow the economy ***and*** create jobs.

*The President's Climate Action Plan: www.whitehouse.gov/share/climate-action-plan

Dynamics of vision: positive aspects of his speech*

To be adopted, visions must reflect the larger culture in which they operate.

When asked to judge between two competing arguments in which they have little or no expertise, people will default to the more compelling vision.

American culture has always been future focused. In the past, similar visions that succeeded aligned with the following factors and conditions:

- A core belief that the future should be better than the past

-A strong moral imperative to better the lot of the individual

-An individualistic ethic that celebrates and rewards innovators and inventors

-Mass media can bring the vision to the public

-Business interests that promote the vision of a better world in which their products play a key role

-Popularizers—recognized experts who promote vision as factual & achievable

-A driving external force or event that makes the vision the optimal or necessary

*SOURCE: Center for Cultural Studies and Analysis

Nevertheless, what they heard was…

Lamar Smith, R-Texas

"…the President has once again signaled his intent to move forward with new rules that will make energy more expensive for hardworking American families. … The President plans to use executive orders to bypass Congress and create more red tape that will increase the price of electricity and gasoline."

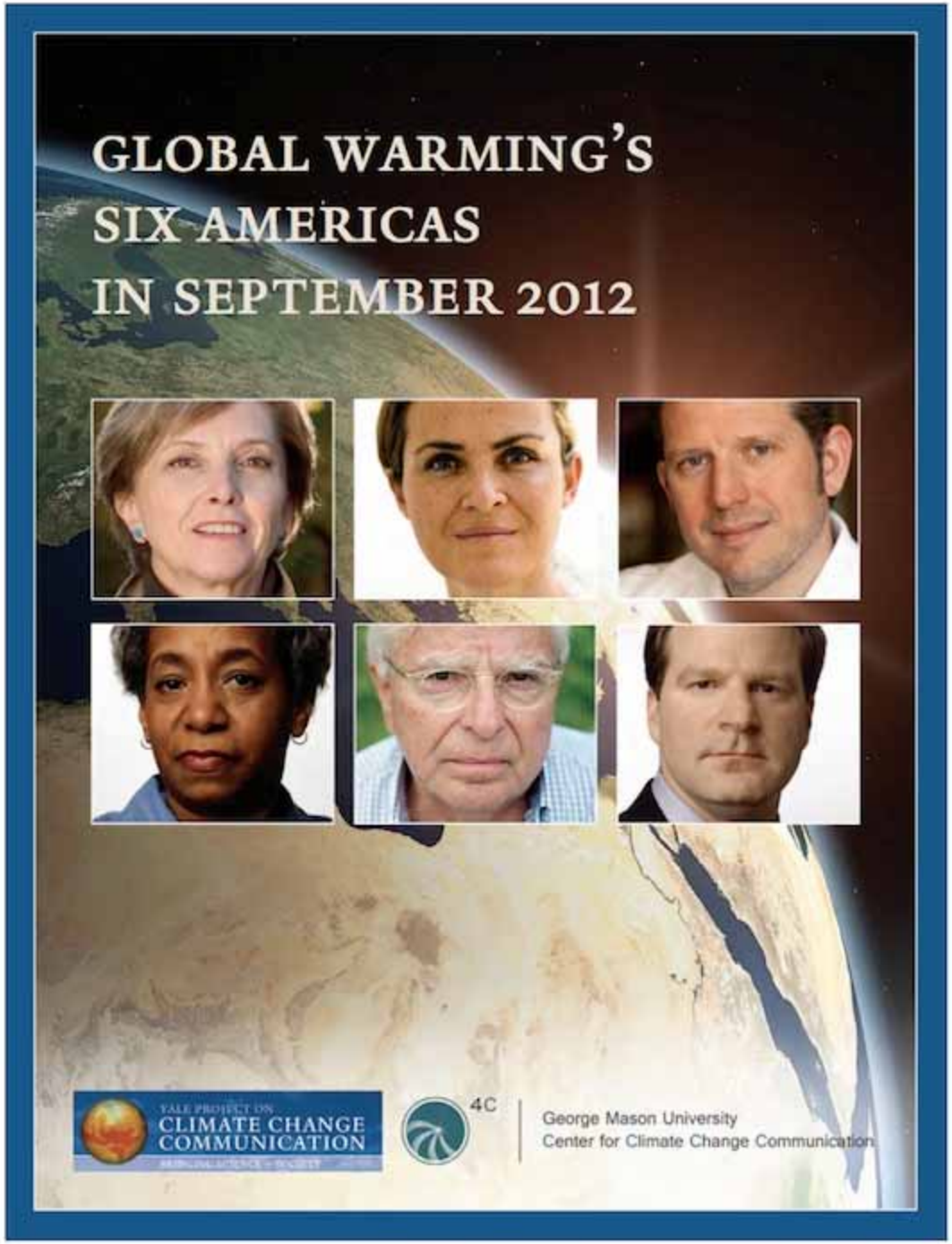
— Congressman Lamar Smith, R-TX

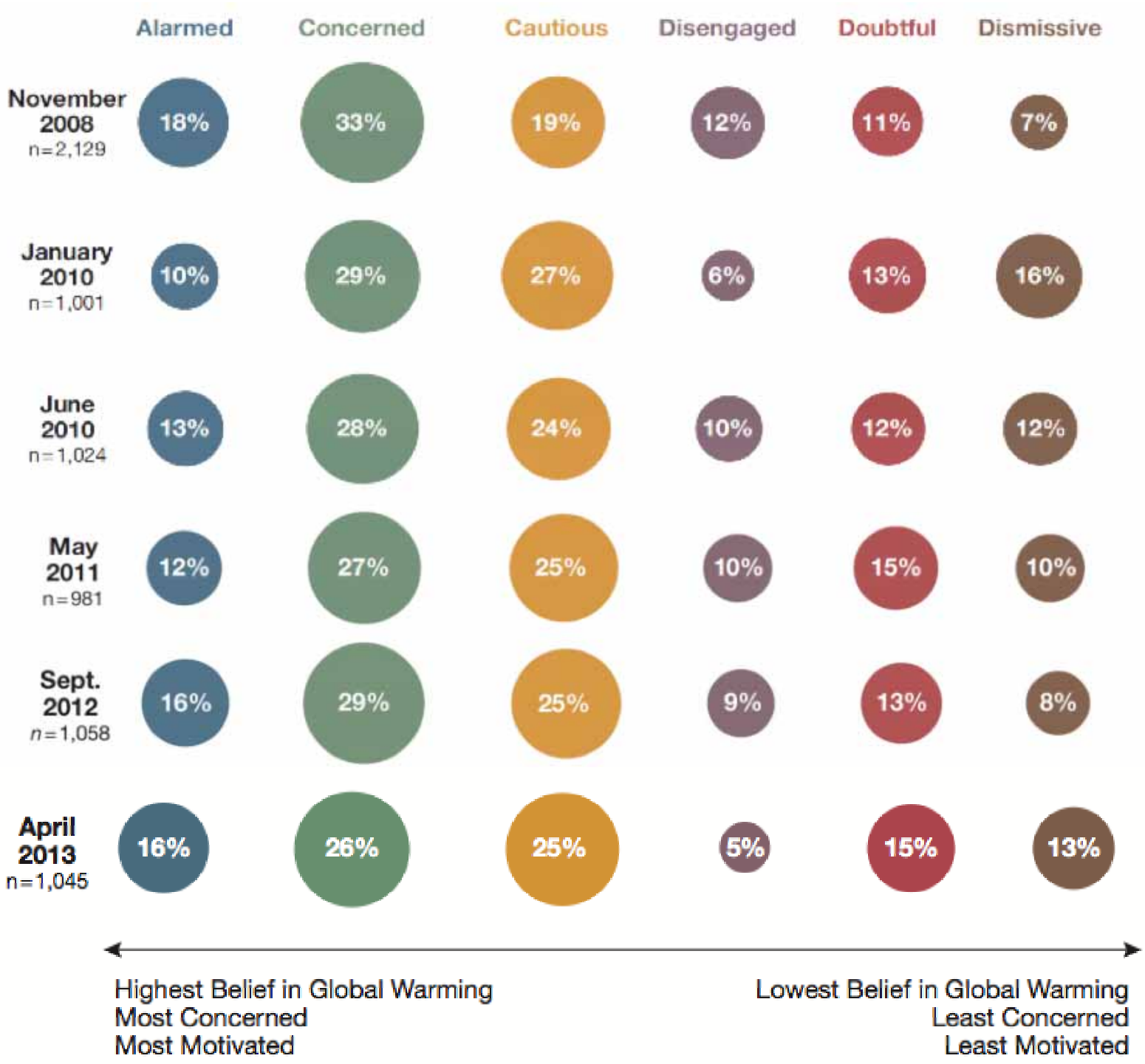
Chris Stewart, R-Utah

"The President's announcement today makes clear that with his final election behind him, he is free to abandon his campaign promise to the nation of an 'all of the above' approach to meet our energy needs."

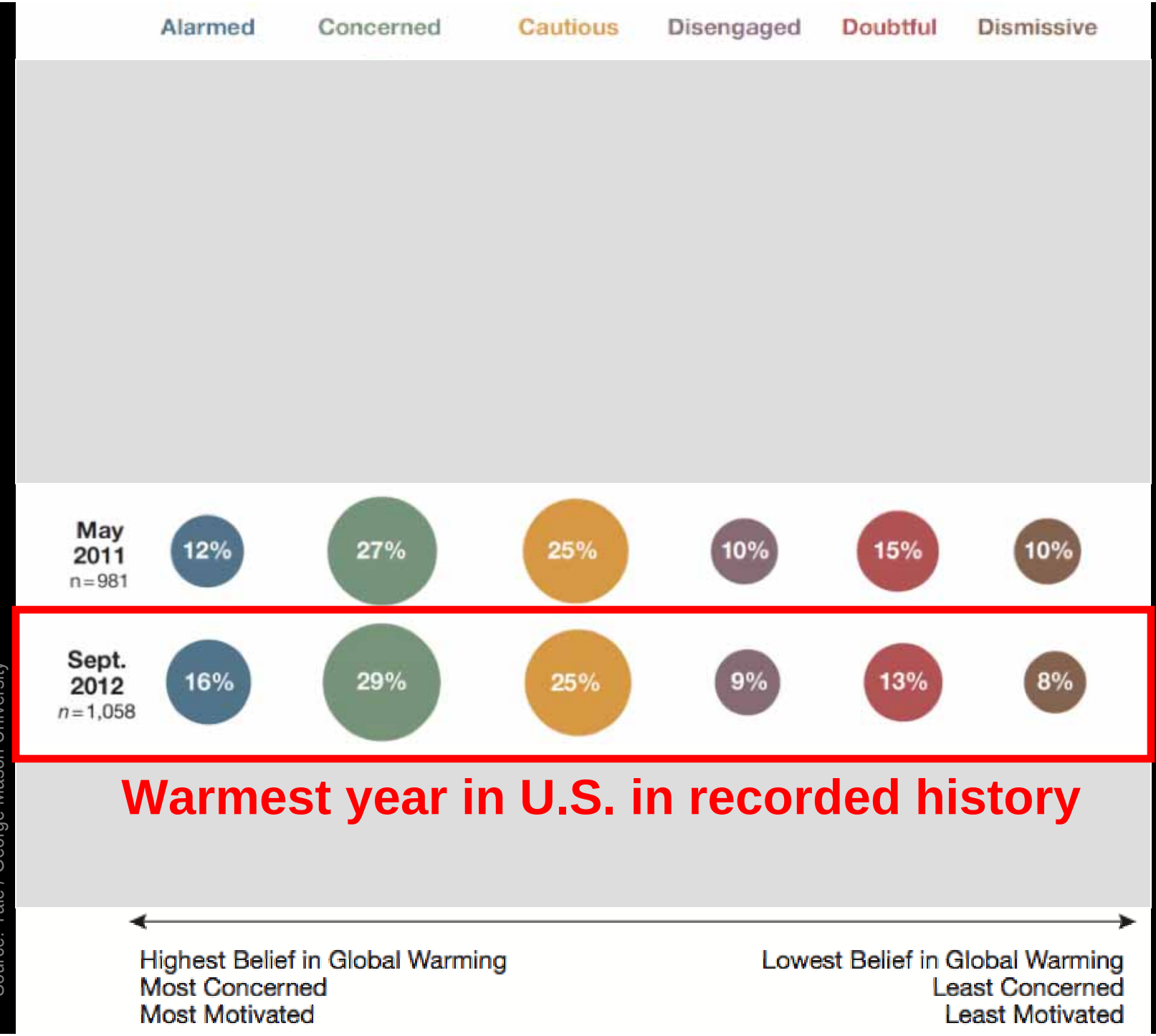
— Congressman Chris Stewart, R-UT

Is this typical partisan politics
or different cultural cognition?


GLOBAL WARMING'S
SIX AMERICAS
IN SEPTEMBER 2012
YALE PROJECT ON
CLIMATE CHANGE
COMMUNICATION
4C
George Mason University
Center for Climate Change Communication



Source: Yale / George Mason University



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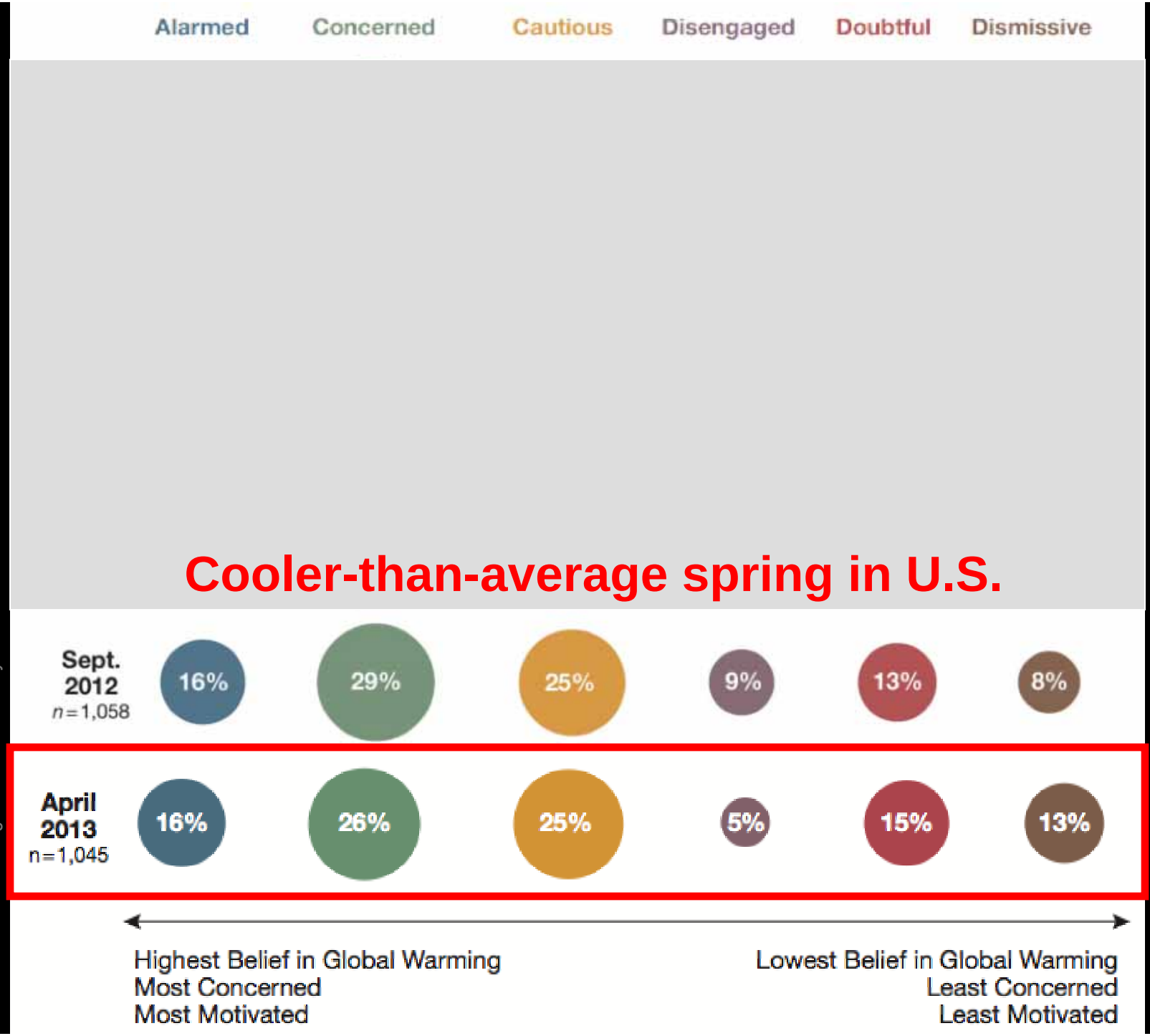
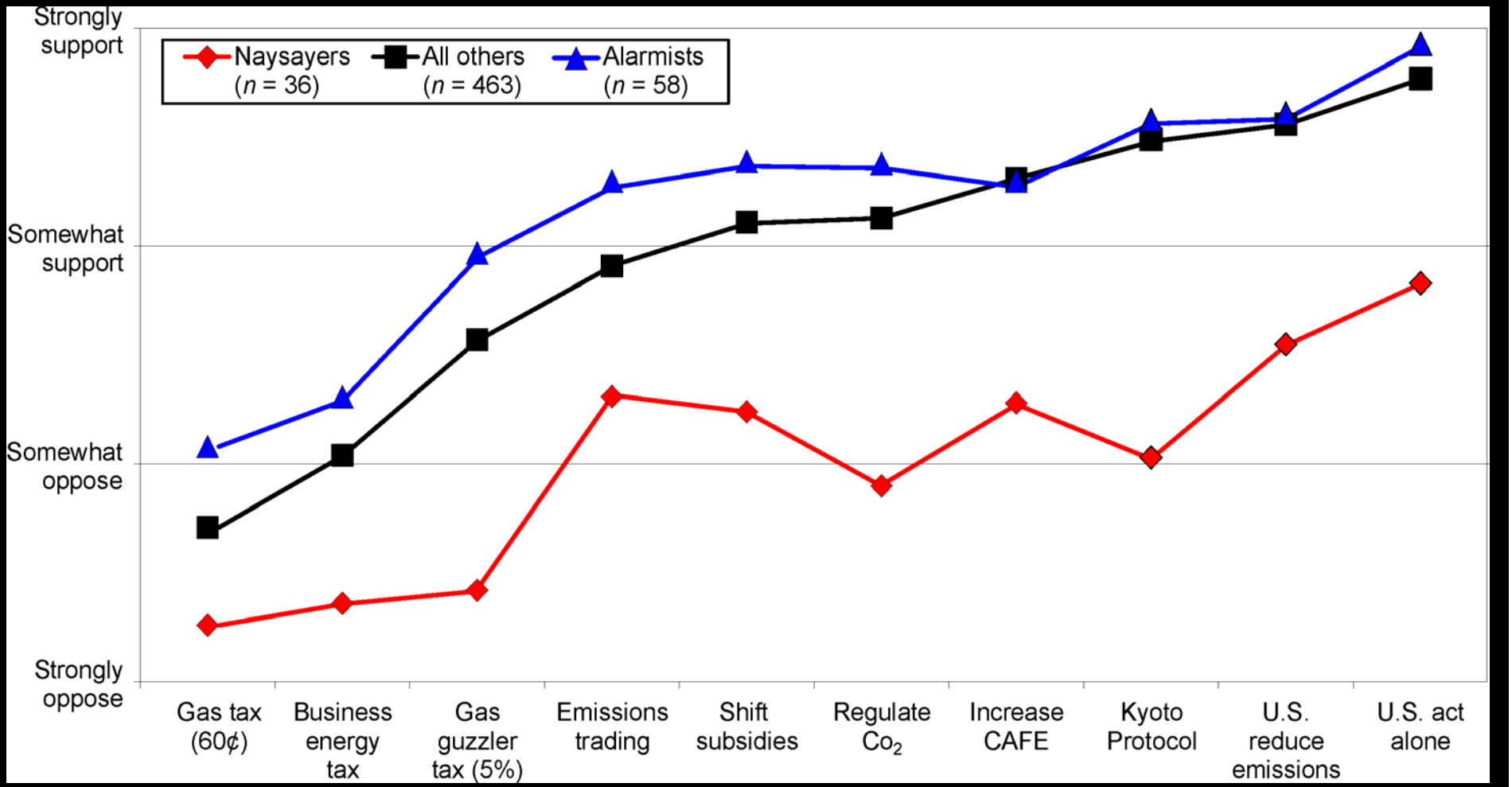


Source: Yale / George Mason University

Key point:

People habitually confuse weather and climate.

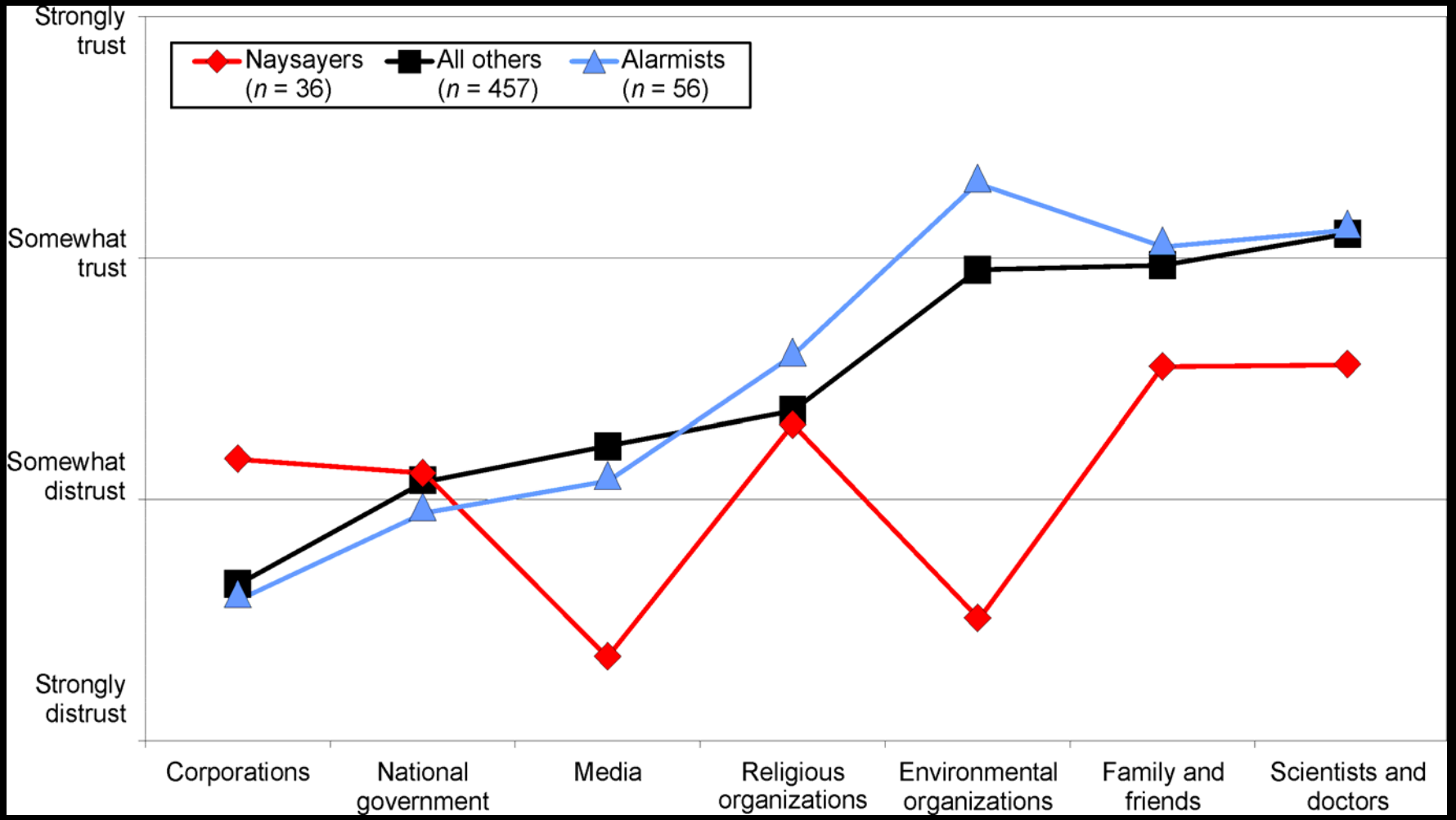
Comparing the 6 Americas: support for policies*



*Source: A. Leiserowitz, Yale U., October 2003 (*n* = 2,189)

Comparing the 6 Americas: trust in sources*

How much do you trust the following groups to tell you the truth about global warming?



*Source: A. Leiserowitz, Yale U., October 2003 (*n* = 2,189)

Comparing the 6 Americas: risk perceptions*

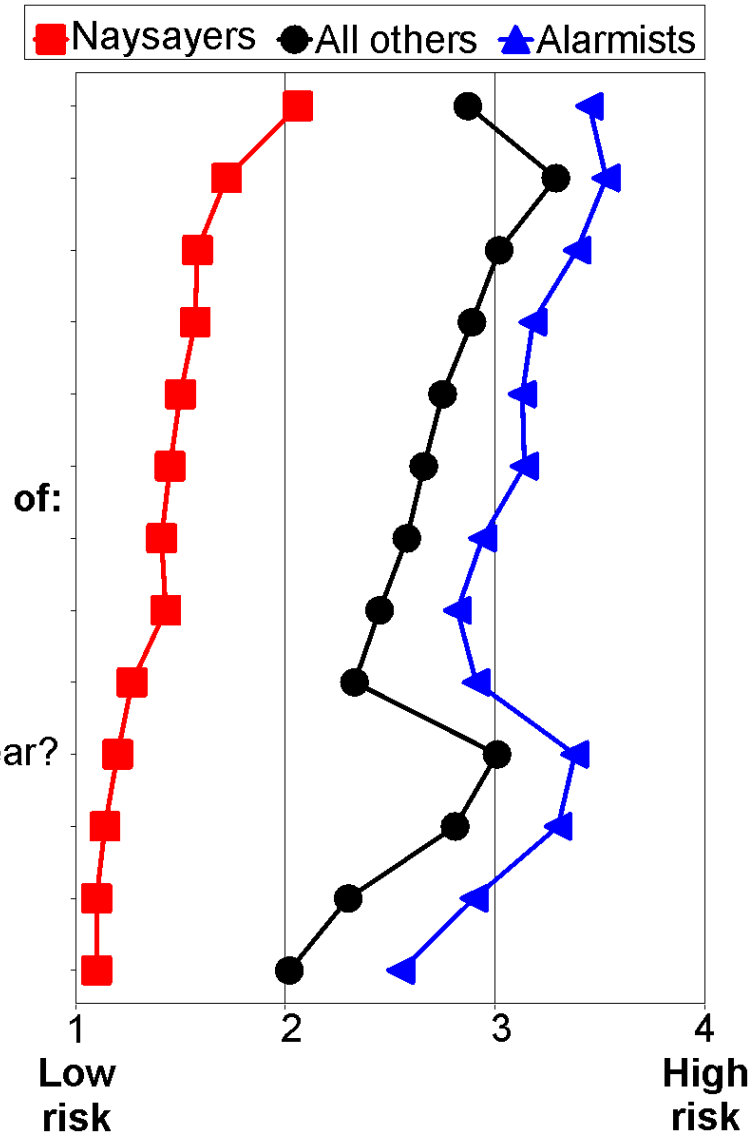
Global warming:
- seriousness of current impacts
- threat to non-human nature
- how concerned are you?

Likelihood, worldwide, next 50 yrs of:
- water shortages
- increased rate of disease
- decreased standards of living

Likelihood, where I live, next 50 years, of:
- water shortage
- increased chance of disease
- decreased standard of living

How many, worldwide, next 50 yrs:
- will be injured/made ill each year?
- will die each year?

How many, worldwide, currently:
- injured or ill each year?
- die each year?



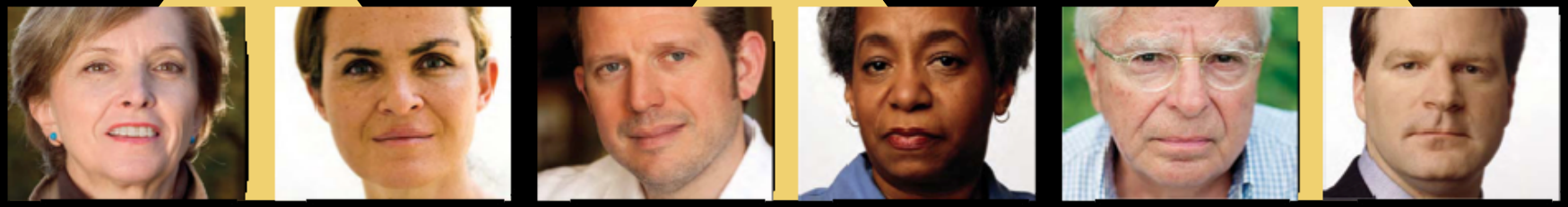
*Source: A. Leiserowitz, Yale U., October 2003 (*n* = 2,189)

If you could ask a climate expert one question…

What can the U.S. do to reduce global warming?

What harm will global warming cause?

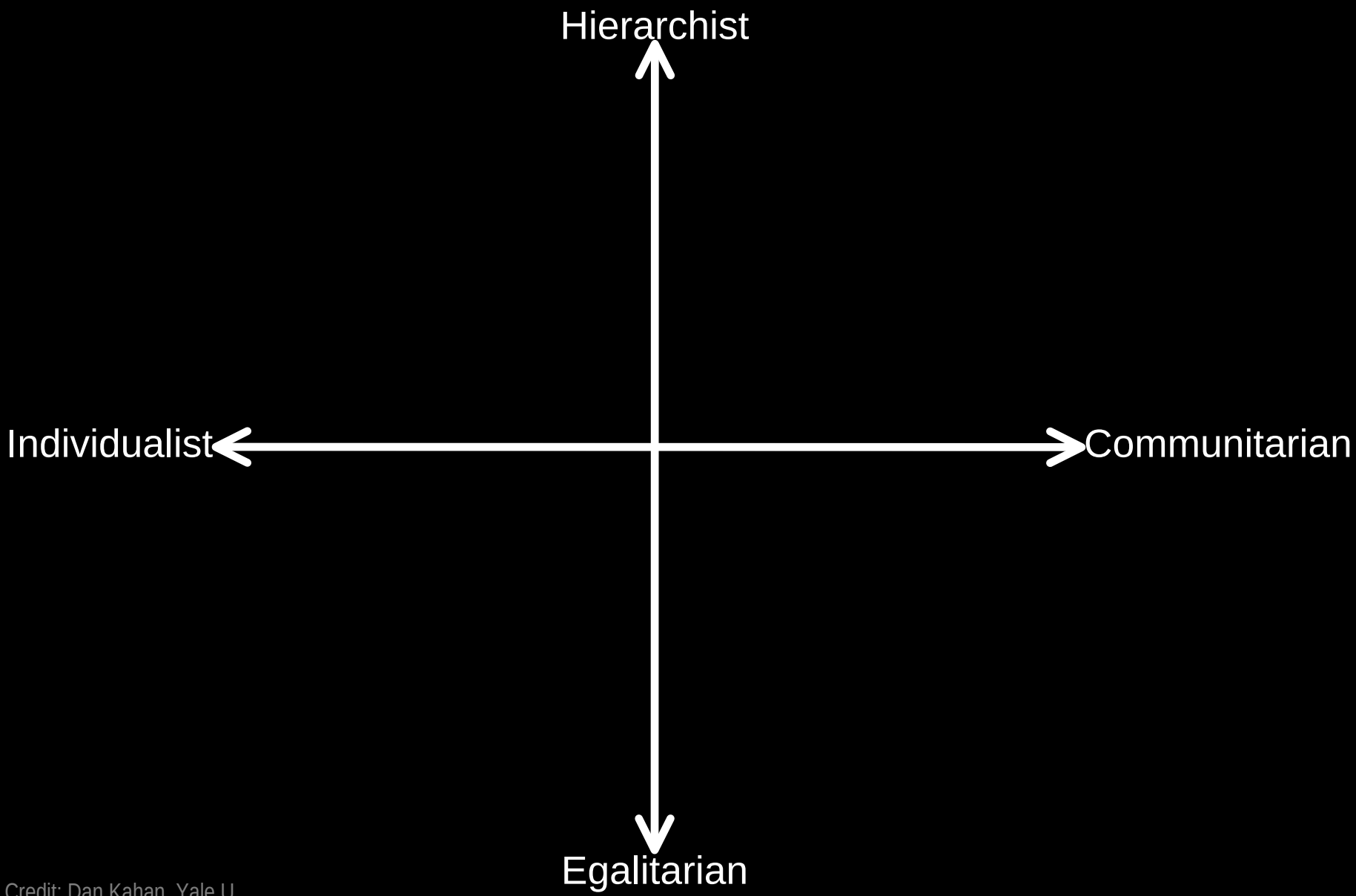
How do you know that global warming is occurring?



Alarmed	Concerned	Cautious	Disengaged	Doubtful	Dismissive
16%	29%	25%	9%	13%	8%

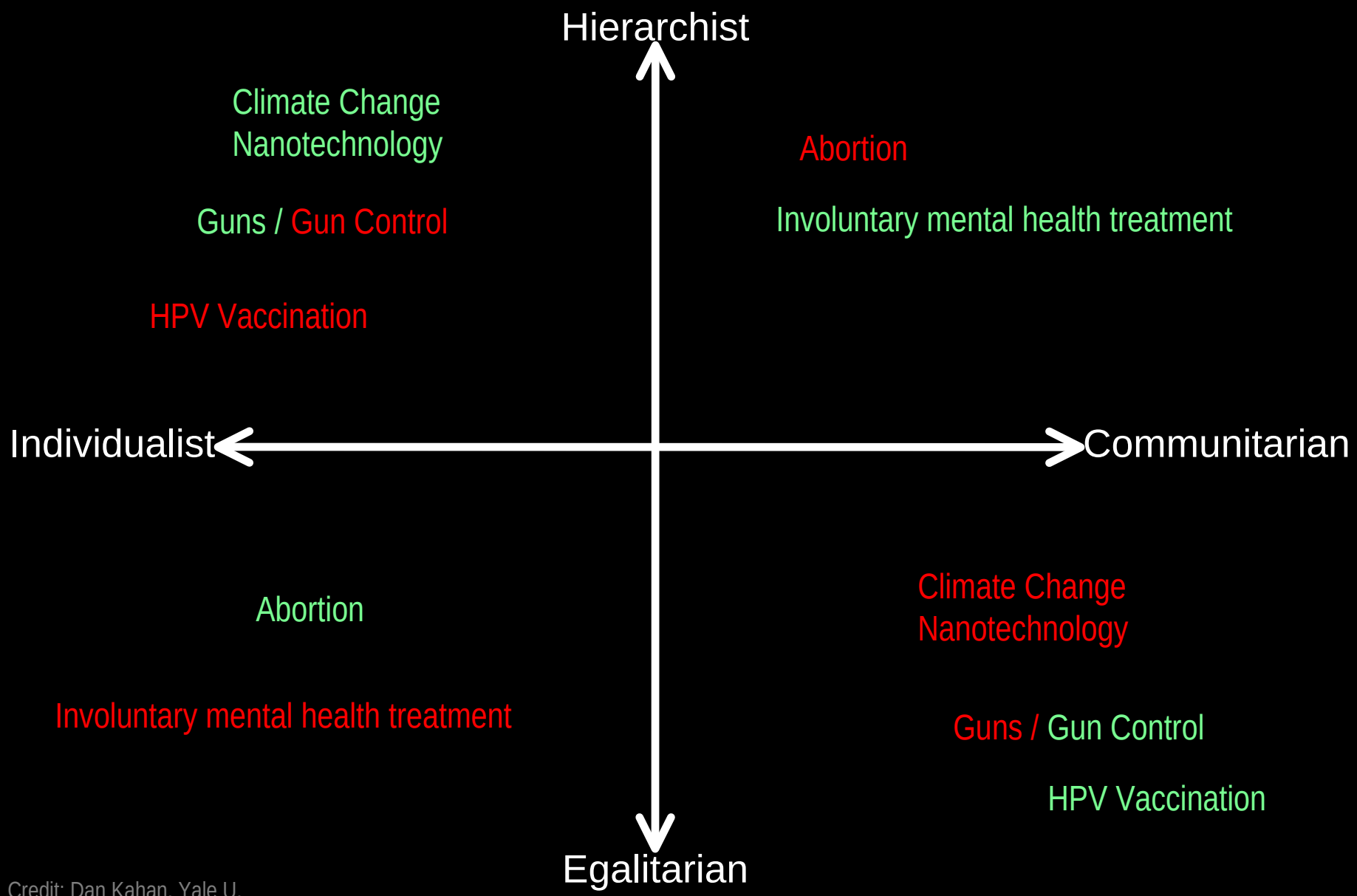
Source: Yale / George Mason University

Cultural worldviews



Credit: Dan Kahan, Yale U.

Cultural worldviews: perception of low vs high risk



Credit: Dan Kahan, Yale U.

Key point:

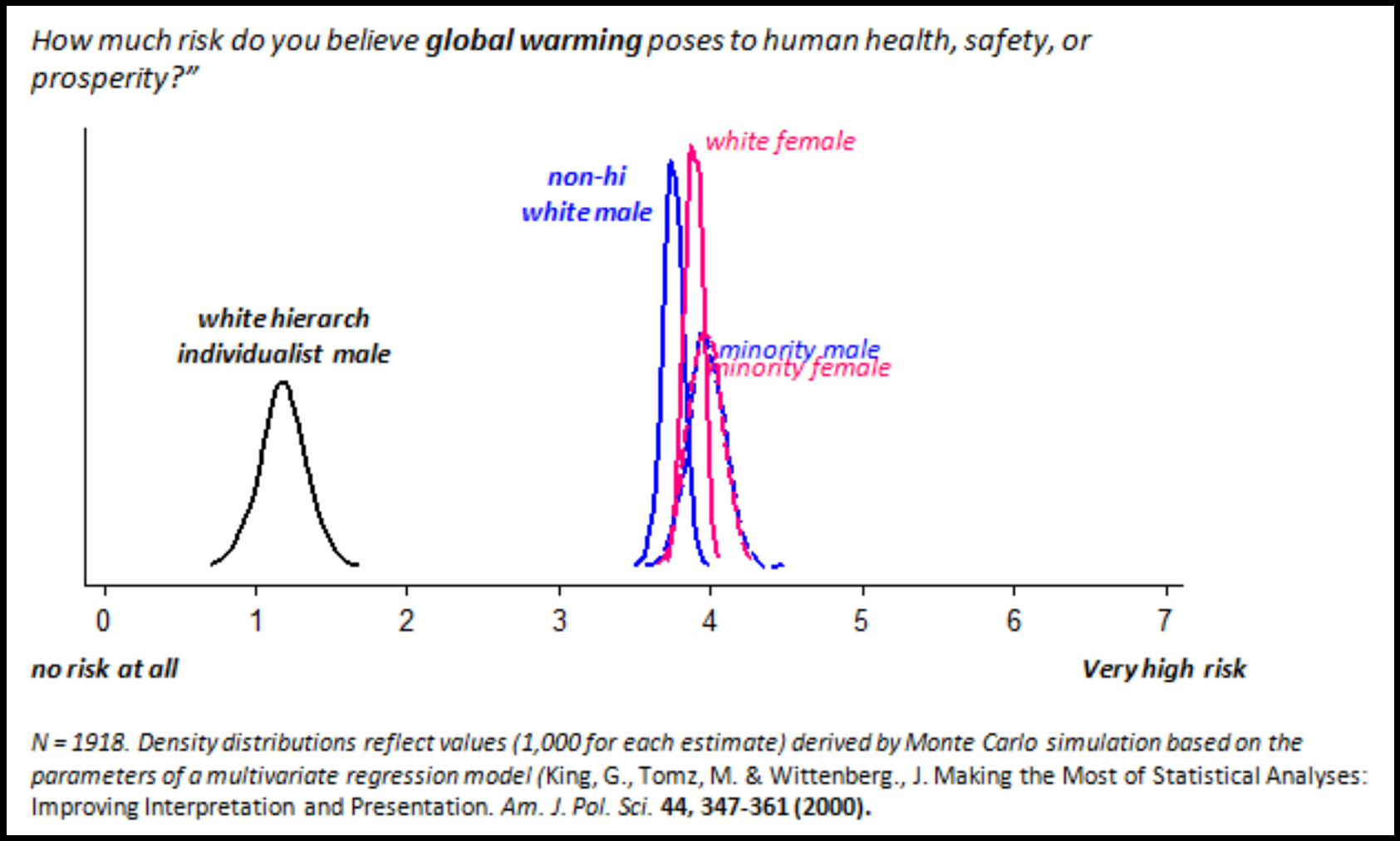
Successful communications are those in which the recipient is predisposed to accept the core assumptions.

Or, to put it another way…

Worldview matters!

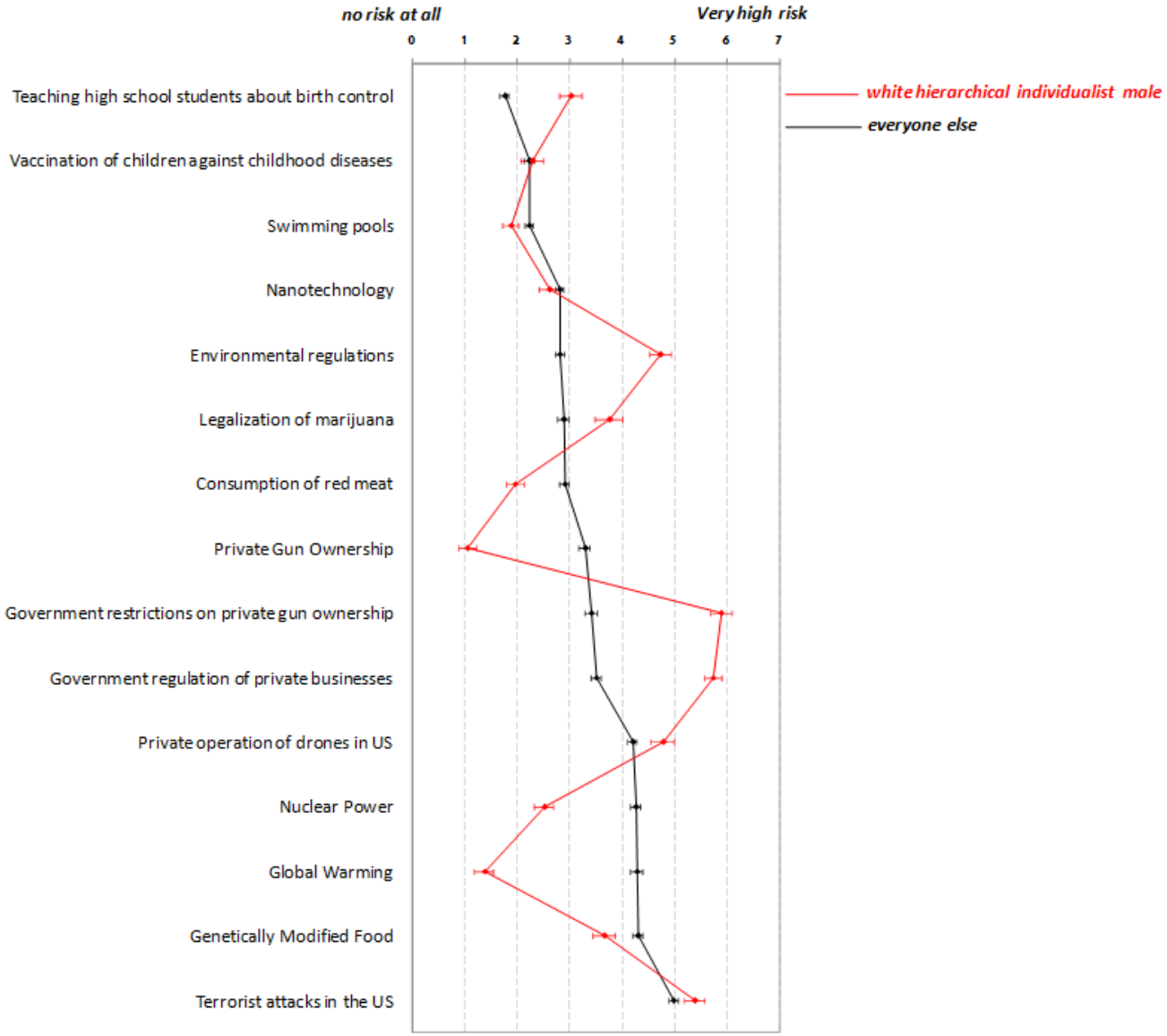
People preferentially seek out information that validates their worldview, and reject information that seems threatening or risky to their cultural identity.

The white hierarch individualist male vs all others



Credit: Dan Kahan, Yale U.

"As individuals and as a society, we face a number of possible hazards. Some threaten people's health, safety, or financial well-being directly. Others threaten health, safety, or financial well-being indirectly through the damage they can impose on the environment or the economy. How much risk do you believe each of the following poses to human health, safety, or prosperity?" **[rotate order; display one at a time]**



N ≈ 2000. Stratified US general population sample. Simple means. CIs reflect 0.95 level of confidence for "true" subsample mean. Data collected April-May 2013.

Credit: Dan Kahan, Yale U.

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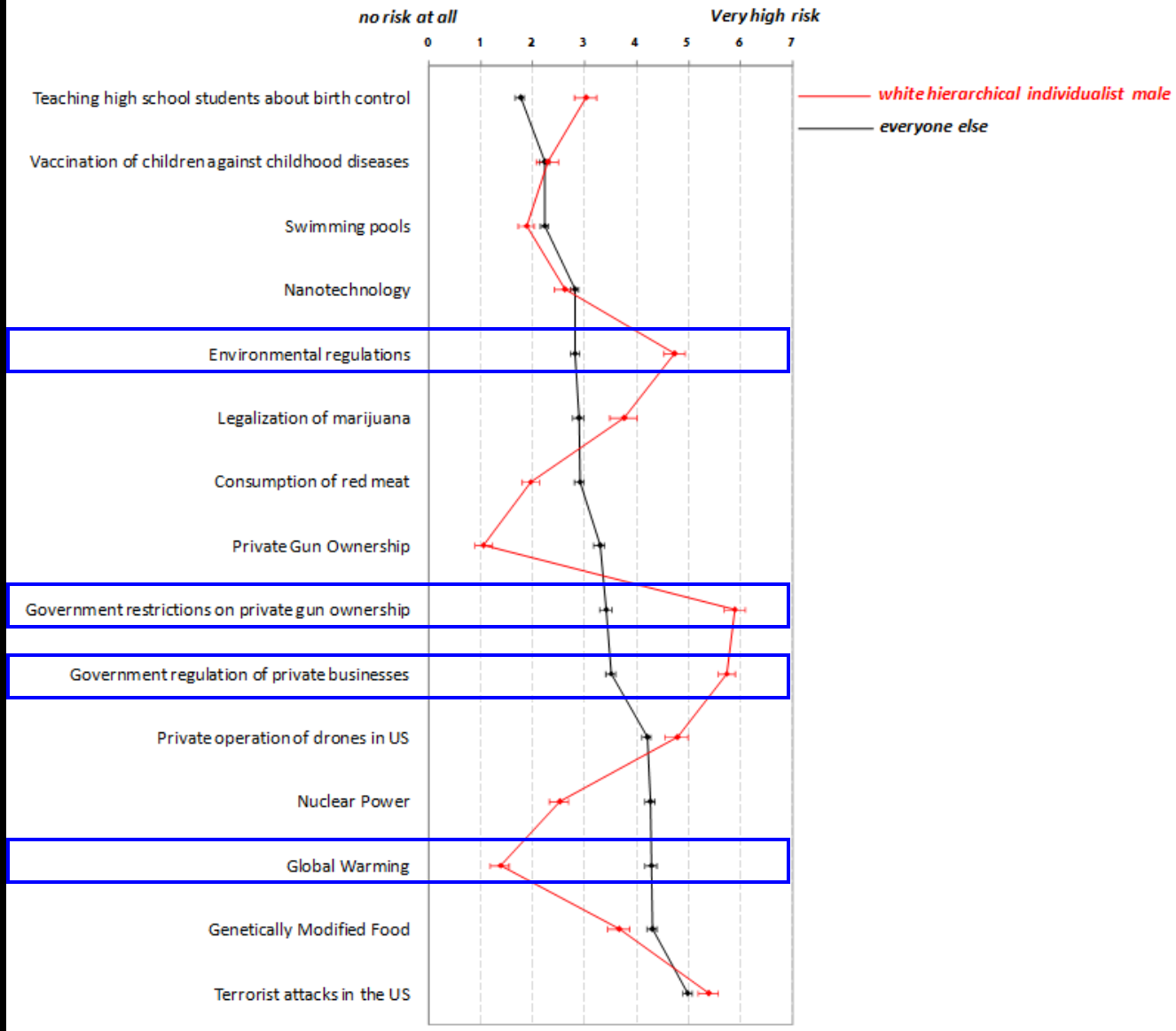

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Credit: Dan Kahan, Yale U.

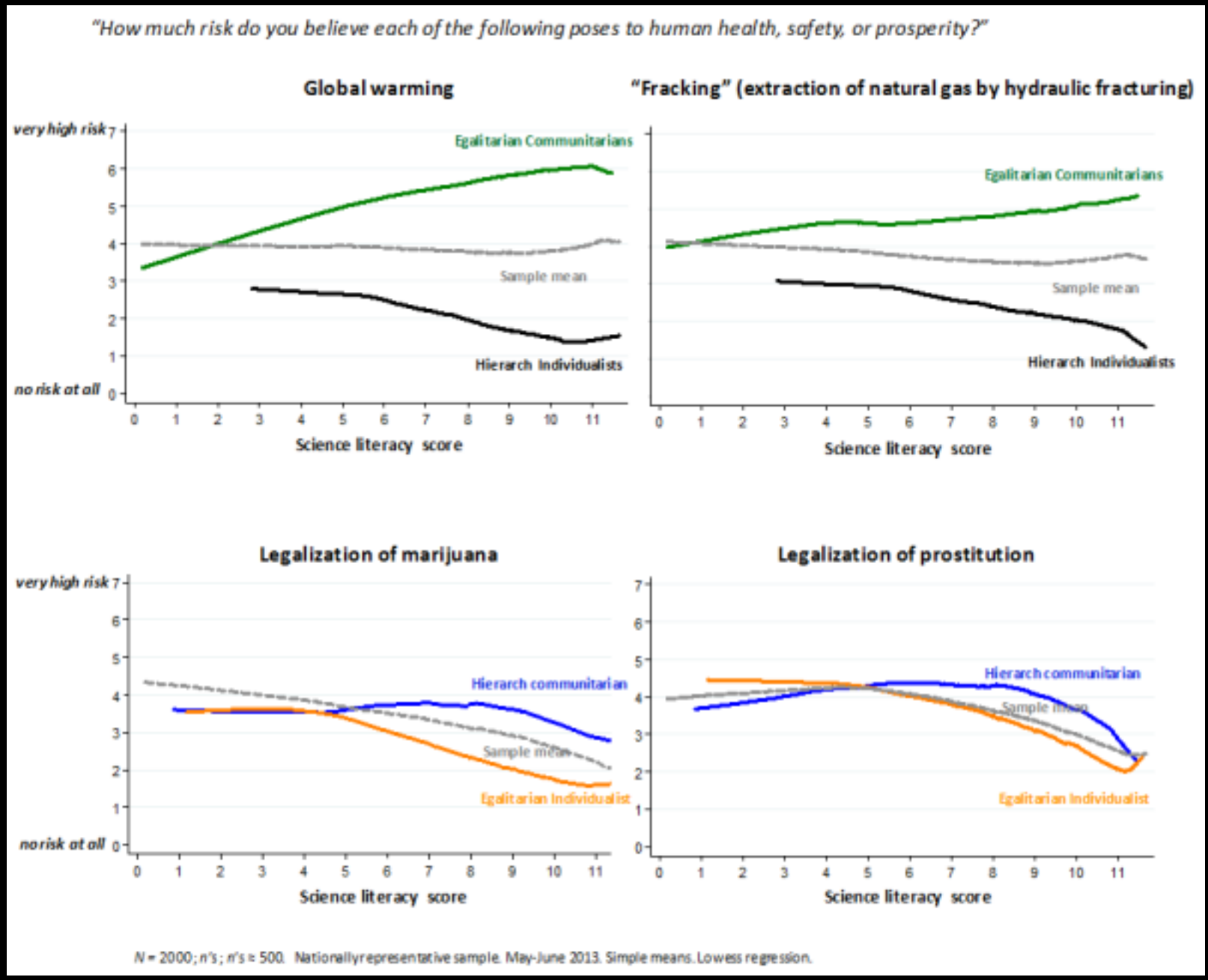
Key point:

Disagreements with denialists are a clash of values, rather than a clash of scientific ideas.

Key point:

The polarization in attitudes and perceptions about global warming is not due to an information deficit.

Improving climate literacy alone is not enough.



Source: Dan Kahan, Yale University

Science is under attack.

Why?

How?

Special interest groups' "FUD" campaigns

Industry groups are fighting government regulation by fomenting scientific uncertainty

DOUBT Is Their Product

By David Michaels
Photographs by Mindy Jones

Few scientific challenges are more complex than understanding the health risks of a chemical or drug. Investigators cannot feed toxic compounds to people to see what doses cause cancer. Instead laboratory researchers rely on animal tests, and epidemiologists examine the human exposures that have already happened in the field. Both types of studies have many uncertainties, and scientists must extrapolate from the evidence to make causal inferences and recommend protective measures. Because absolute certainty is rarely an option, regulatory programs would not be effective if such proof were required. Government officials have to use the best available evidence to set limits for harmful chemicals and determine the safety of pharmaceuticals.

Uncertainty is an inherent problem of science, but manufactured uncertainty is another matter entirely. Over the past three decades, industry groups have frequently become involved in the investigative process when their interests are threatened. If, for example, studies show that a company is exposing its workers to dangerous levels of a certain chemical, the business typically responds by hiring its own researchers to cast doubt on the studies. Or if a pharmaceutical firm faces questions about the safety of one of its drugs, its executives trumpet company-sponsored trials that show no significant health risks while ignoring or hiding other studies that are much less reassuring. The vilification of threatening research as "junk science" and the corresponding sanctification of industry-commissioned vinyl chloride, chromium, benzene, benzidine, nickel, and a long list of other toxic chemicals and medications. What is more, Congress and the administration of President George W. Bush have encouraged such tactics by making it easier for private groups to challenge government-funded research. Although in some cases, companies may be raising legitimate arguments, the overall result is disturbing: many corporations have successfully avoided expense and inconvenience by blocking and stalling much needed protections for public health.

The Taxicab Standard

A GOOD EXAMPLE of the current battles between industry and science is the controversy over beryllium. This lightweight metal is vital to the production of nuclear warheads because it increases the yield of the explosions; throughout the cold war, the U.S. nuclear weapons complex was the nation's largest consumer of the substance. Beryllium and its alloys are now used to make electronics equipment and even golf clubs. But the metal is also extremely toxic—breathing in tiny amounts can cause chronic beryllium disease (CBD), a debilitating ailment that scars the lungs. Victims have included not just the machinists who worked directly with the metal but others simply in the vicinity of the milling and grinding processes, often for very short periods. One accountant developed CBD after working for a few weeks each year in an office near where beryllium was being processed. CBD has also been diagnosed in people living near beryllium factories.

Michaels, David: "Doubt is Their Product." *Scientific American.* June 2005, page 96.

The art and science of ‘spin’ has evolved

Frank Luntz

The art and science of ‘spin’ has evolved

“The scientific debate is closing [against us] but not yet closed. There is still a window of opportunity to challenge the science… Voters believe that there is no consensus about global warming within the scientific community. Should the public come to believe that the scientific issues are settled, their views about global warming will change accordingly.”

—Frank Luntz
2002 memo to President George W. Bush
“The Environment: A Cleaner, Healthier, Safer America”

Frank Luntz

Key point:

97% of scientists agree that Earth is warming and that the main reason is human activities are driving up heat-trapping gases in the atmosphere.

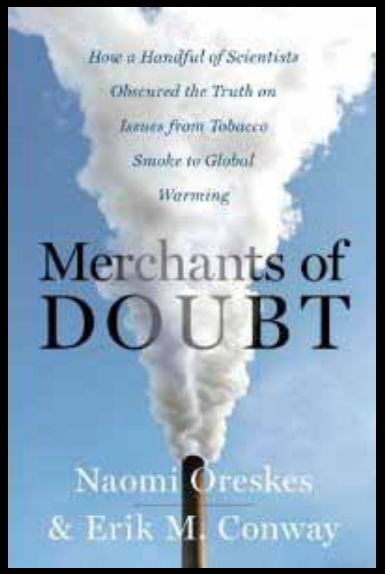
References:

Cook, John, *et al.* (2013): “Quantifying the consensus on anthropogenic global warming in the scientific literature.” *Environmental Research Letters.* 15 May 2013.

Doran, Peter and Maggie Kendall Zimmerman (2009): “Examining the Scientific Consensus on Climate Change.” *Eos,* v90, no. 3; 20 Jan 2009.

Oreskes, Naomi (2004): “The Scientific Consensus on Climate Change.” *Science,* v306. 3 Dec 2004. p1686.

Scientific information competes with . . .



…intentional disinformation

Key point:

People will throw science under a bus before they will give up their values or their cultural identity.

To put it another way:

People seek information to validate their worldviews and to reinforce their cultural identity.

In the absence of truth, people will settle for truisms.

Truth:

The body of real things, events, and facts. A statement that is in accord with factual evidence or self-evident reality.

vs

Truisms:

A statement that is obviously true and says nothing new or interesting. A proposition that states nothing beyond what is implied by any of its terms.

Truth:

The body of real things, events, and facts; a statement that is in accord with factual evidence or self-evident reality.

Carbon dioxide is a heat-trapping gas and humans have increased its abundance in the atmosphere by about 40%.

vs

Truisms:

A statement that is obviously true and says nothing new or interesting. A proposition that states nothing beyond what is implied by any of its terms.

“Every time we exhale, we exhale carbon dioxide. Every cow in the world, you know, when they do what they do you’ve got more carbon dioxide.” [Rep. John Boehner, R-Ohio]

Key point:

The quickest way to gain someone’s trust is to listen to them and then address their chief complaint first.

Know your target audience's values before you engage

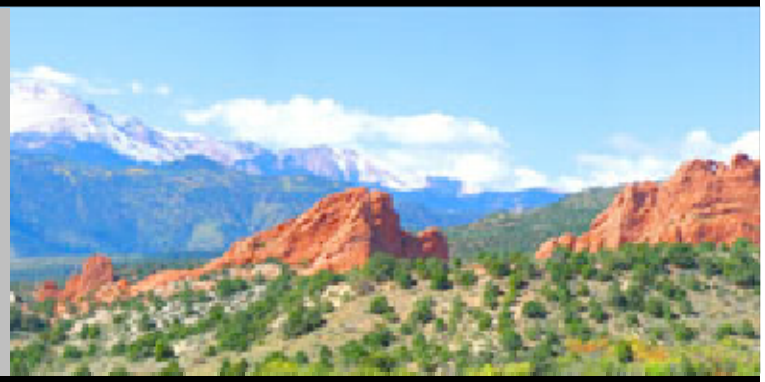
Anecdotal evidence:

"…the drought forecasts issued by the National Integrated Drought Information System, are very useful to farmers, water planners, and other state and local officials."

—Rep. Ralph Hall (R-Tex) (6-22-2011)

"We would cite the National Integrated Drought Information System (NIDIS) as an example of how federal agencies can work together and with states… it demonstrates key elements of how... to deliver actionable information to end users and decision-makers."

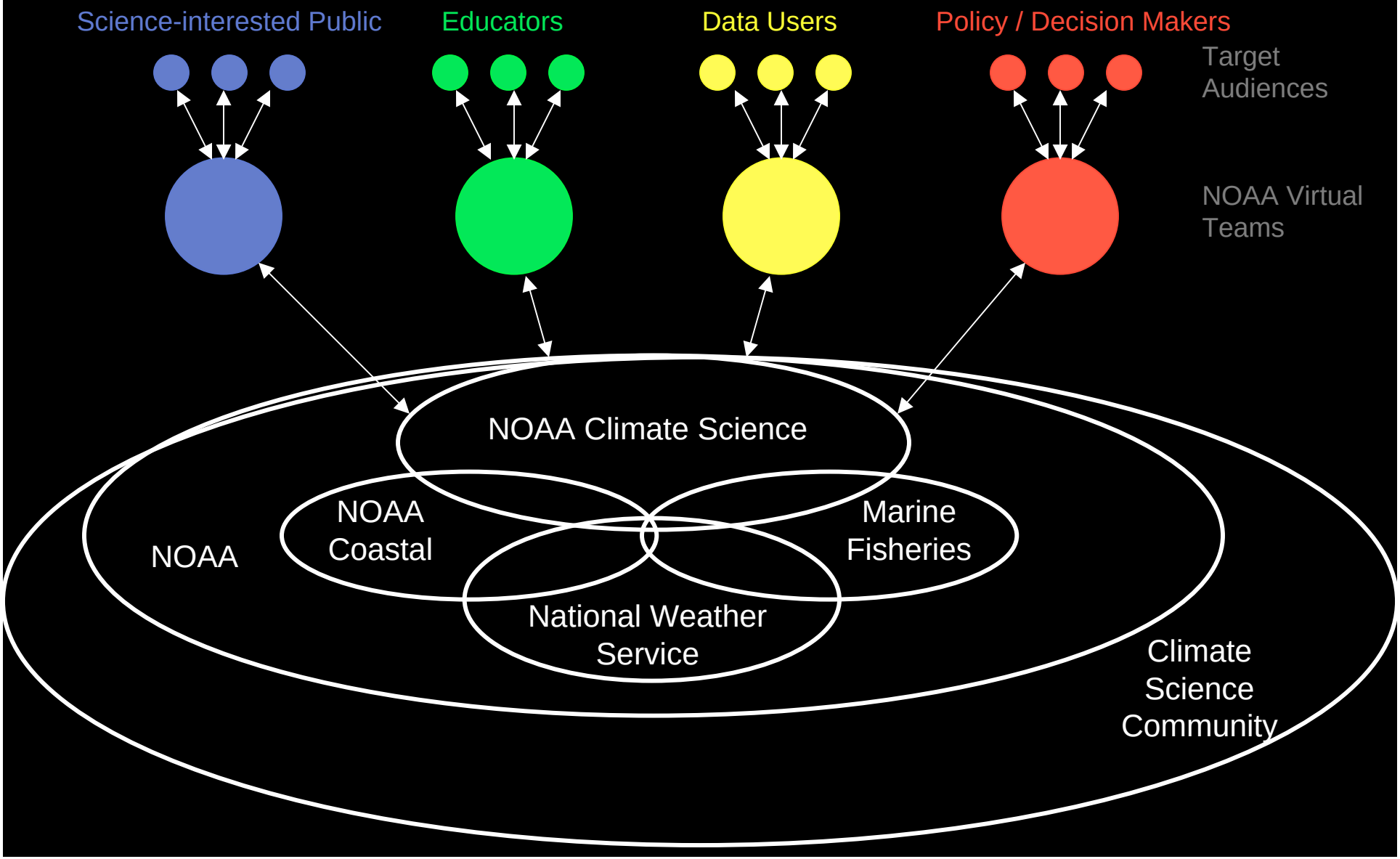
—Letter from the Western Governors to CEQ
(Response to CEQ Adaptation Interim Report), May 21, 2010



Part 3:

NOAA Climate.gov's strategic approach to communication, education, & engagement

Who and why: start at the audience interface and work backward into the agency

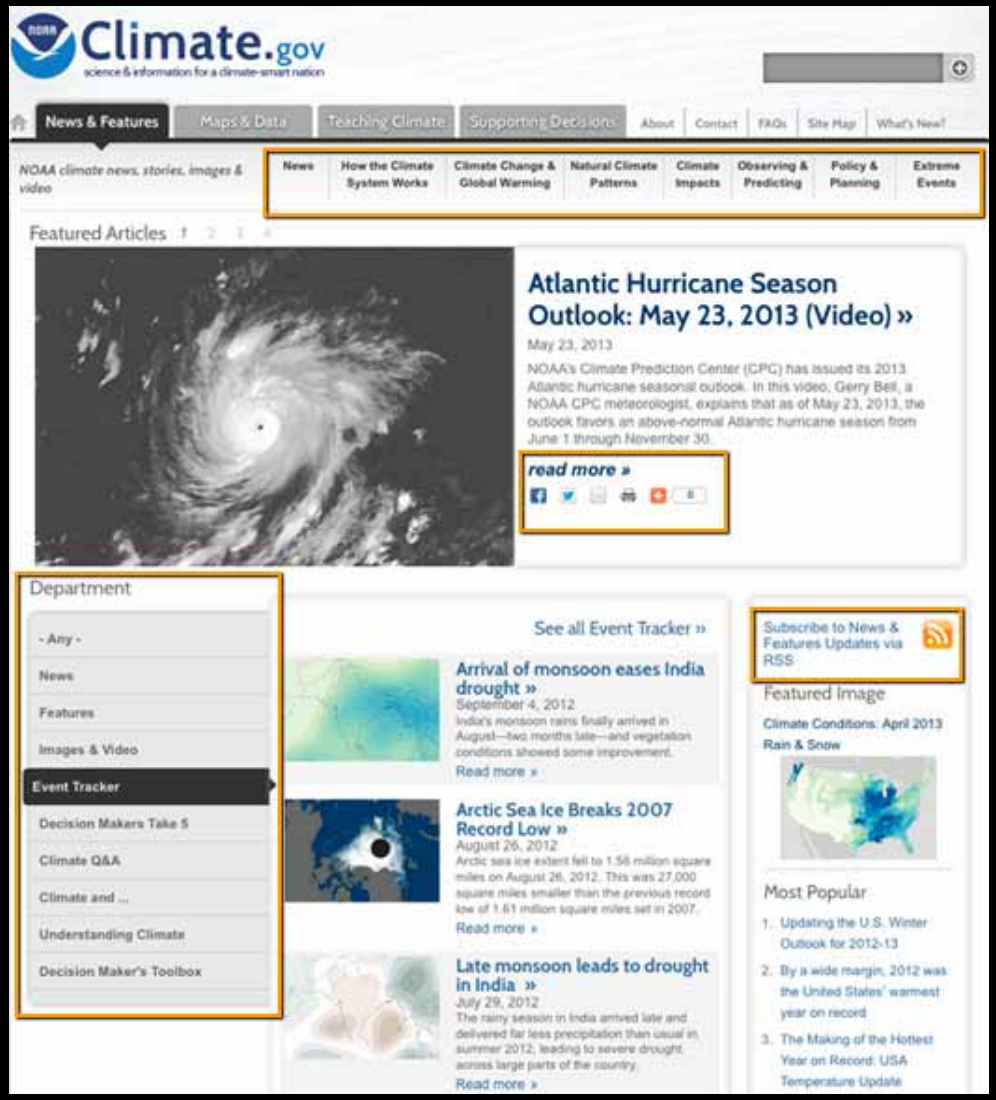


NOAA Climate.gov recently got a facelift

http://www.climate.gov

Climate.gov began as a rapid prototyping effort in February 2010. Based on user feedback, the site was entirely rebuilt and version 2.0 rolled out in May.

ClimateWatch Magazine renamed “News & Features”



Goals of re-design

- accommodate user feedback
- reflect the new, more magazine-like structure

Significant changes

- ClimateWatch Magazine name retired
- Primary navigation now based on plain-language categories instead of content type
- Expanded list of departments, with a wider variety of styles
- Greater prominence of social media & syndication options.

Video Production

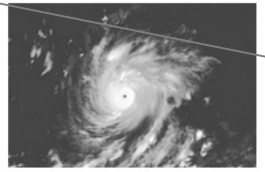
Featured Images | Videos

Sources and Cycles: Balancing Water Needs

June 10, 2013

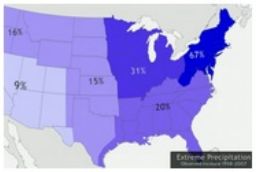
Worried about Water? Tracking Climate Assures Supply (Video)

June 10, 2013



Atlantic Hurricane Season Outlook: May 23, 2013 (Video)

May 23, 2013



(Video) To Escape Drought, Slow and Steady Wins the Race

May 20, 2013

(Video) Local Is Everything: Climate Divisions Tell Your Story

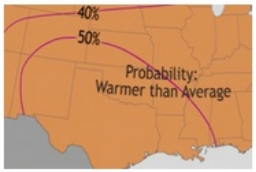
May 20, 2013

Local Is Not Global: Pockets of Cold in a Warming World

April 19, 2013

March: Out Like a Lion

April 18, 2013



Spring 2013: Little Relief from Drought

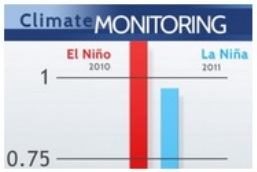
April 1, 2013

Winter 2012-2013 In Review, Western Snowpack and Water Supply (VIDEO)

March 11, 2013

Extreme Events of 2012: Global to Local Responses

Extreme Events of 2012



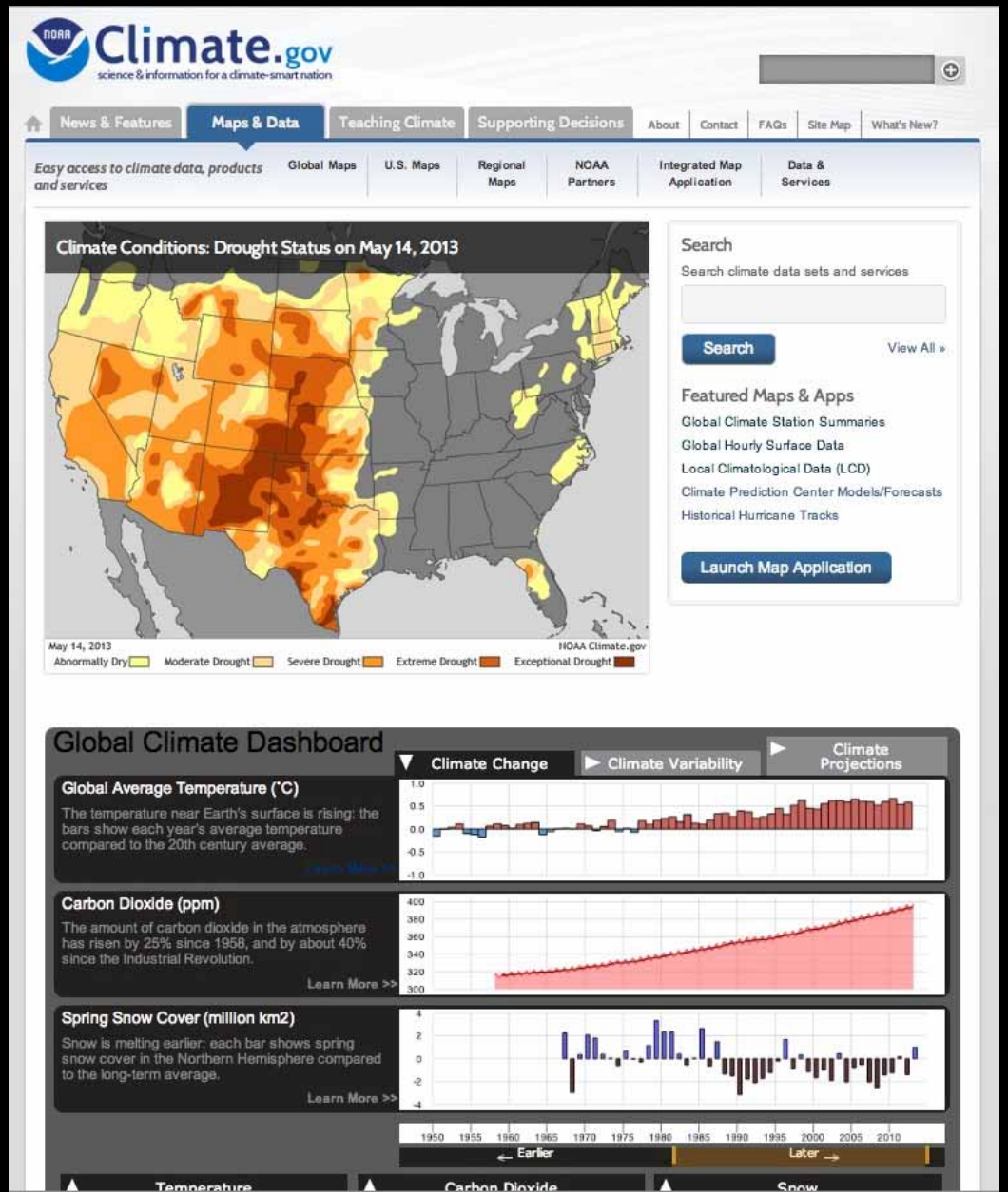
The Pushy Pacific: Variability and Change in Global Temperature

Featuring…

- NOAA scientists providing context, narration & explanation about climate conditions as well as our information services

- Stakeholders and decision makers sharing details about climate impacts, ways they use NOAA products, interesting case studies, lessons learned, etc.

Data & Services renamed “Maps & Data”



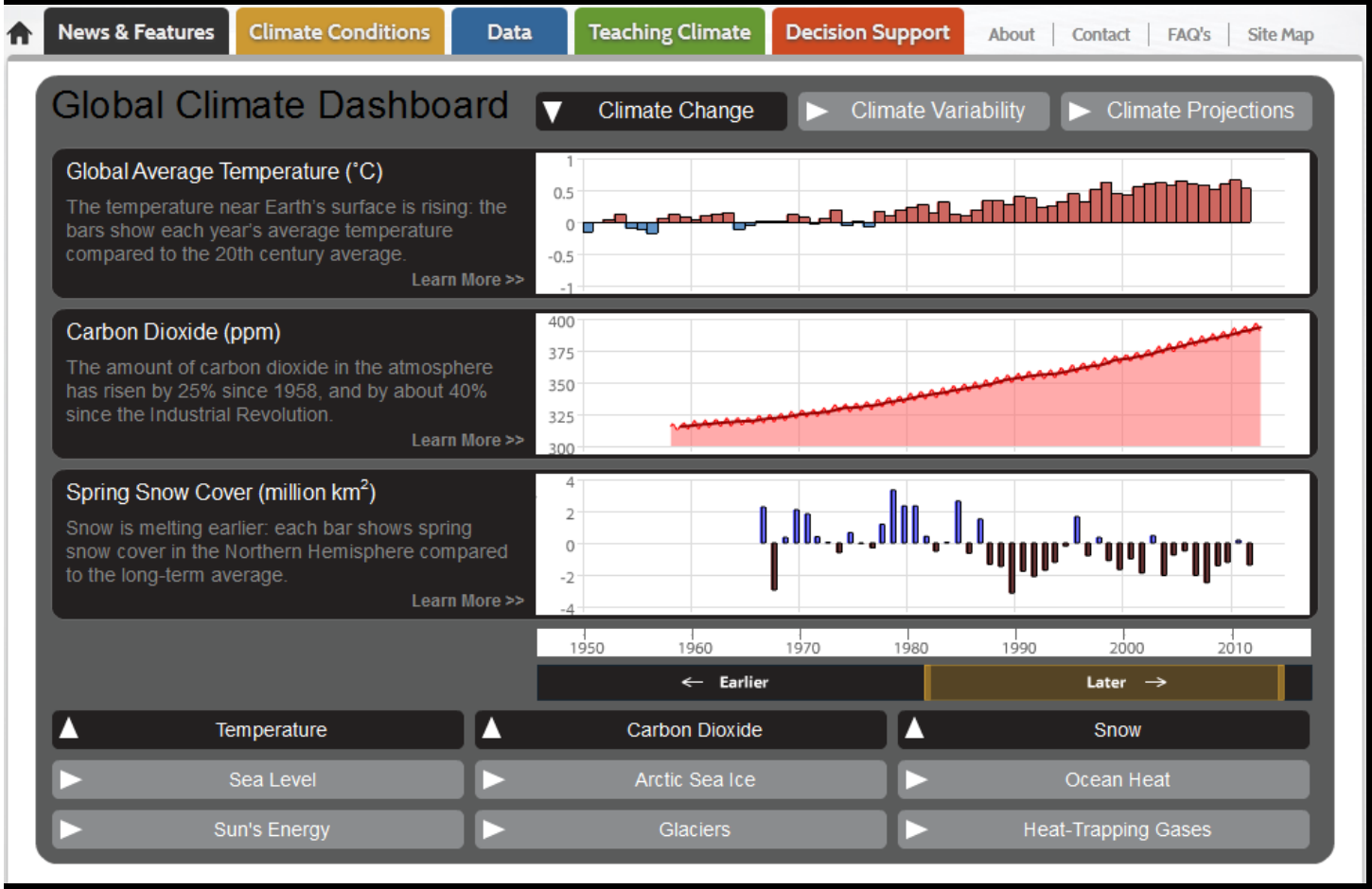
Content sortable by categories:

- Global Maps
- Regional Maps
- United States Maps
- Global Climate Dashboard

Search types:

- Integrated Maps Application
- Text Search for data sets and services
- Browse Library

Global Climate Dashboard



Now accessible via portable devices (iPad, iPhone, etc.)

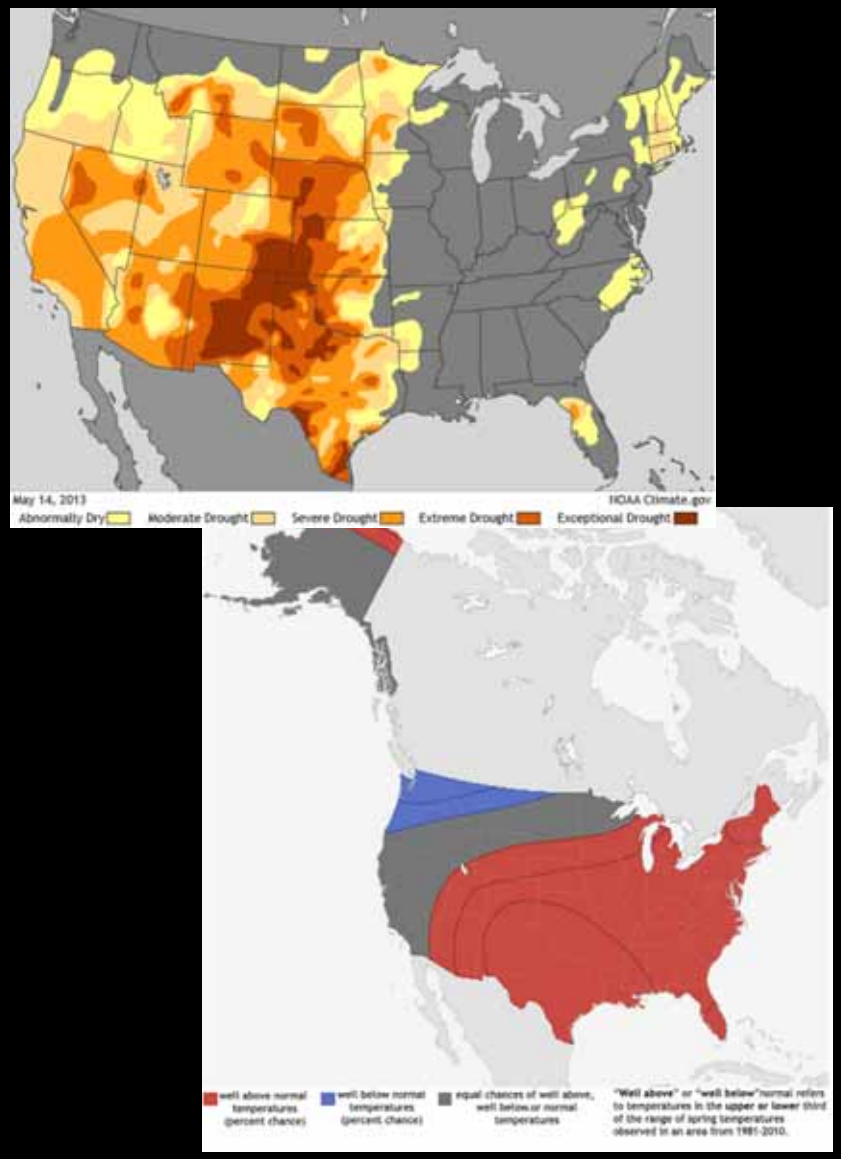
Just as a dashboard gives instant information on the status of a vehicle's various systems, NOAA's Global Climate Dashboard presents an overview of the current state of Earth's climate system in historical context.

Adjustable sliders allow users to focus on the time period of interest.

Hover cursor over graphs to see specific values for each data point .

Click on "Learn More" to jump to more detailed landing pages with more details produced in a popular style.

Data Snapshots to roll out later this year



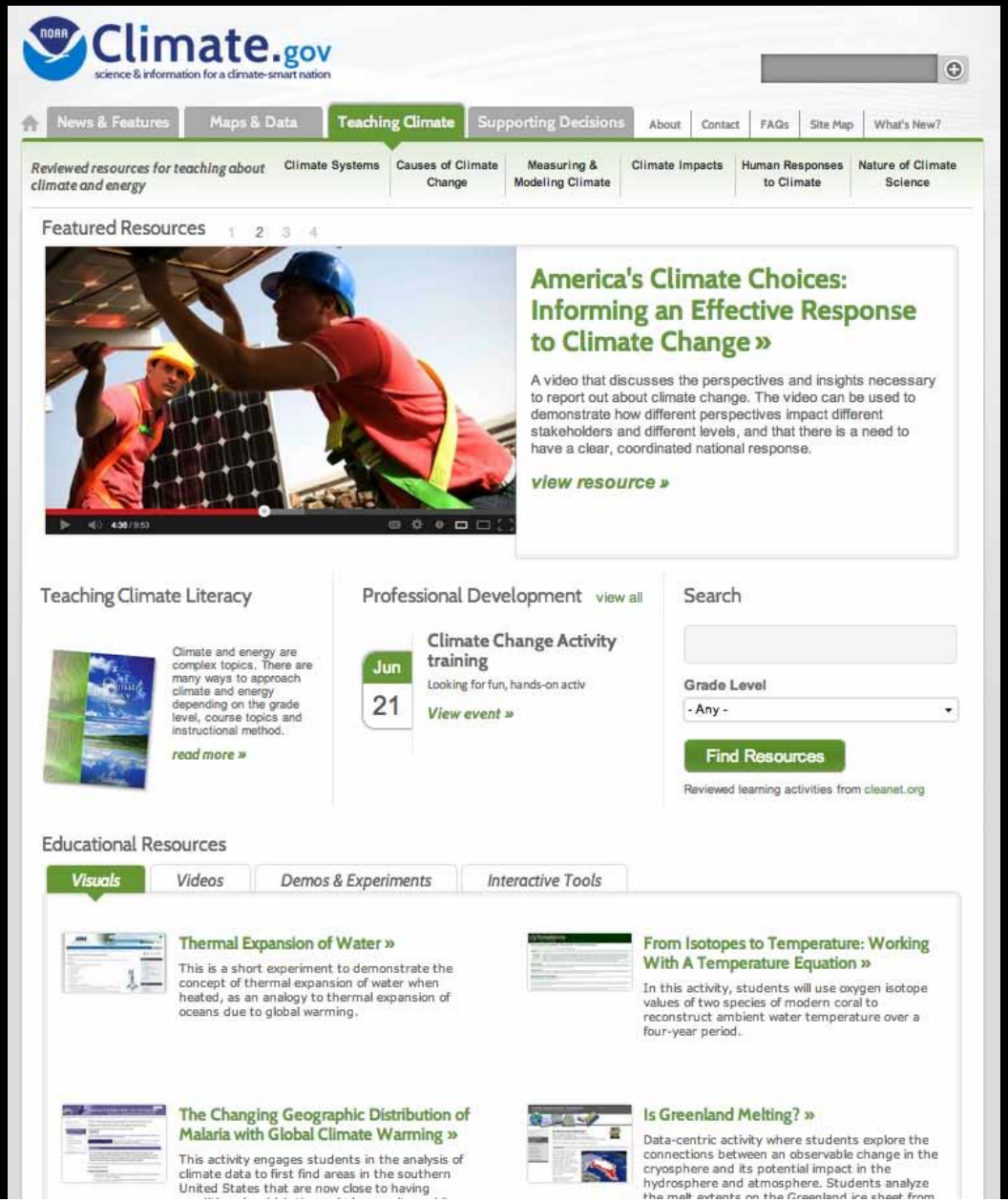
A public-friendly gallery of attractive maps of recent conditions and near-term outlooks

Designed for intuitive visual perception and accompanied by plain English descriptions

We partner with data providers to generate accurate depictions of their validated data products, and link directly to their data

Download options include graphics for presentations or blogs, print, TV broadcasts, or analysis

Education renamed “Teaching Climate”

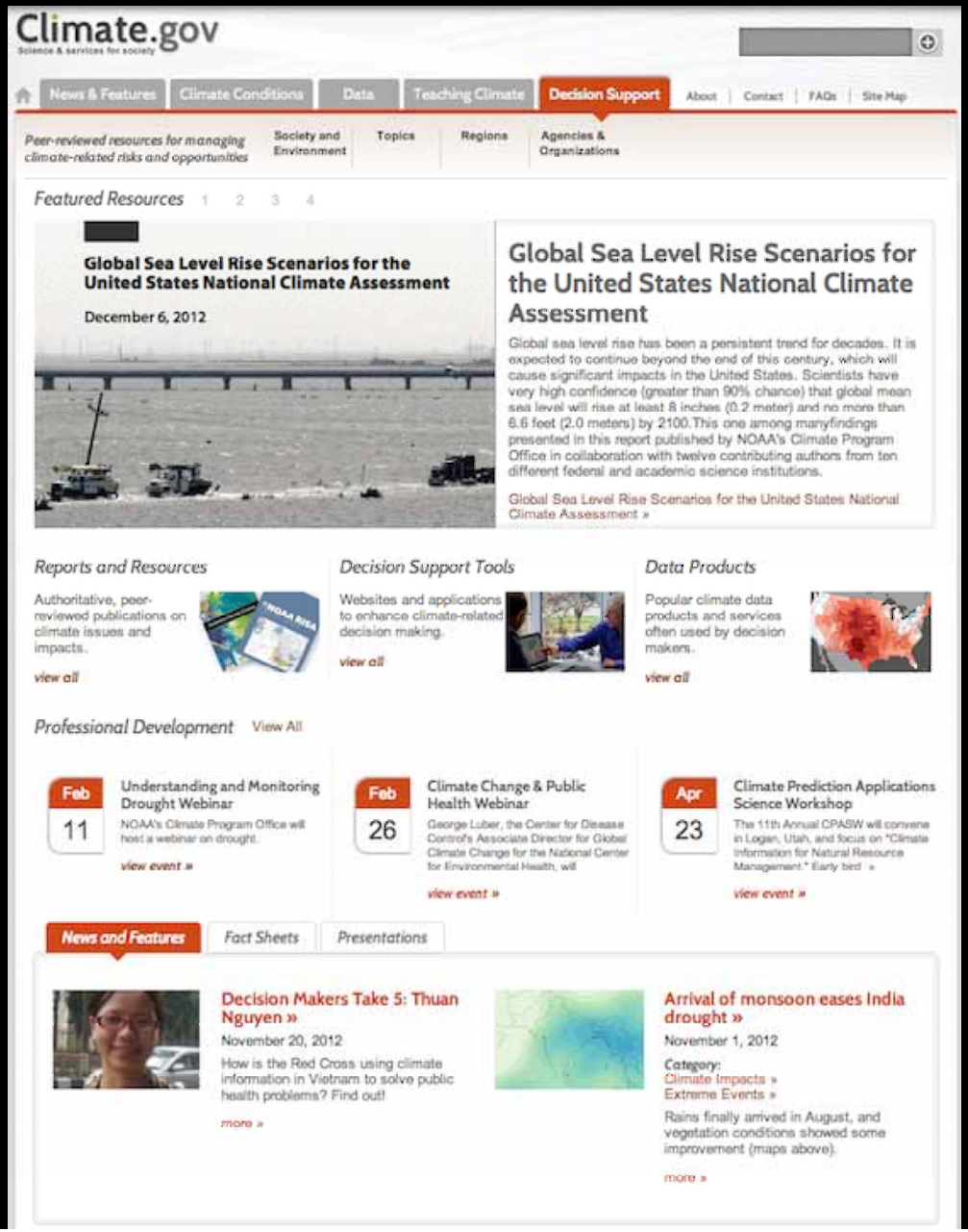


Teaching Climate provides syndication of the CLEAN collection (cleanet.org) along with other sections’ content

The section features educator-focused resources:

- Teaching Climate Literacy guide provides educators detailed discussions & strategies
- Curriculum Maps of Climate Concepts for grades 3 to 16
- Professional development resources and opportunities for educators
- Rigorously reviewed educational resources on climate and energy topics from the CLEAN Collection
  - Scientific accuracy
  - Pedagogical soundness
  - Usability

Understanding Climate renamed ‘Decision Support’



Peer-reviewed resources for policy leaders & decision makers to help them manage their climate-related risks & opportunities

Content aggregated into categories:

- Society & Environment (i.e., sectors)
- Topics
- Regions
- Agencies & Organizations

Content types:

- Reports & Assessments
- Decision Support Tools
- Datasets
- Fact Sheets & Presentations
- Professional Development Opportunities

Our 3-pronged strategy for building relationships with target audiences