

The psychology of the climate crisis

Adam Aron

Dept Psychology and Neuroscience Graduate Program

Co-Chair; [Senate Task Force on Climate Crisis](#)

Faculty Mentor; [UCSD Green New Deal](#)

About me

Our predicament

The urgency

Why aren't we acting - and what can cogsci do?

The theory of change

What UCSD and the wider UC must do soon

About me

My research is in cognitive neuroscience - which has nothing to do with the climate crisis

Citations ~19K
H-index 51
Overall \$\$ ~8million



Psychology of Climate Crisis, March 2019



Petition to Society for Neuroscience, Oct 2019

Trends in Cognitive Sciences

Science & Society

The Climate Crisis Needs Attention from Cognitive Scientists

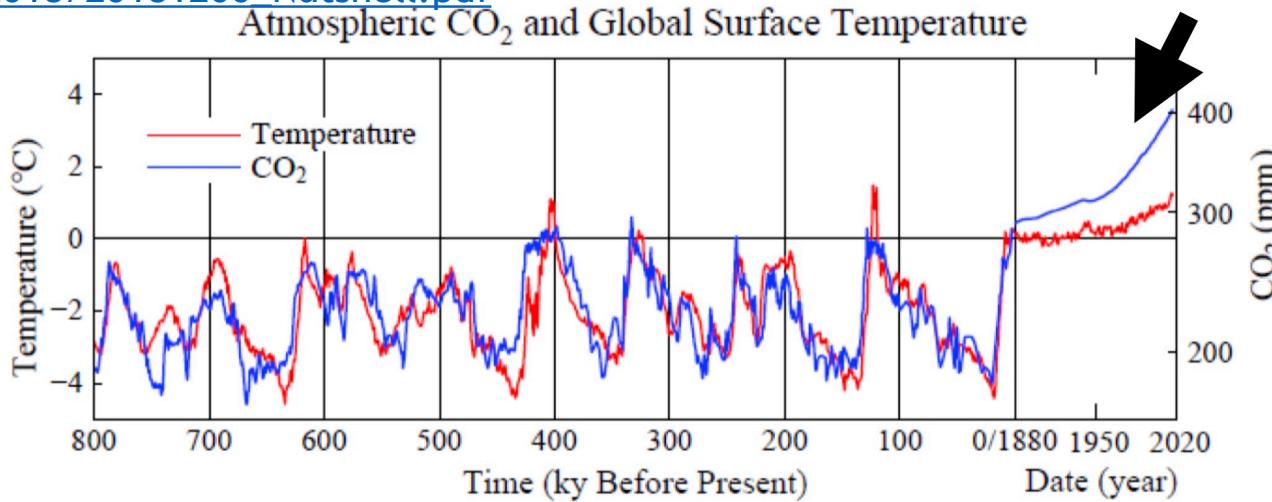
Adam R. Aron^{1,*}

To prevent the devastating consequences of anthropogenic global heating, immediate collective action is needed to reduce fossil fuel emissions. Cognitive scientists are in a special position to facilitate collective action by researching the factors underlying belief and action, and by teaching students how to think about the biggest problem of their lives.

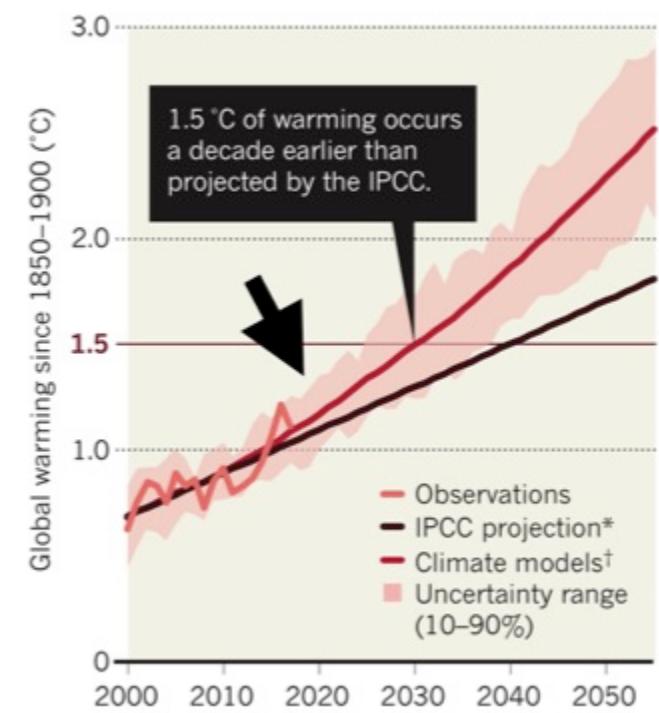
Our predicament

The 4th National Assessment (Trump administration) affirms we are on the worst pathway (RCP 8.5). We may have 1.5 degrees C by 2030.

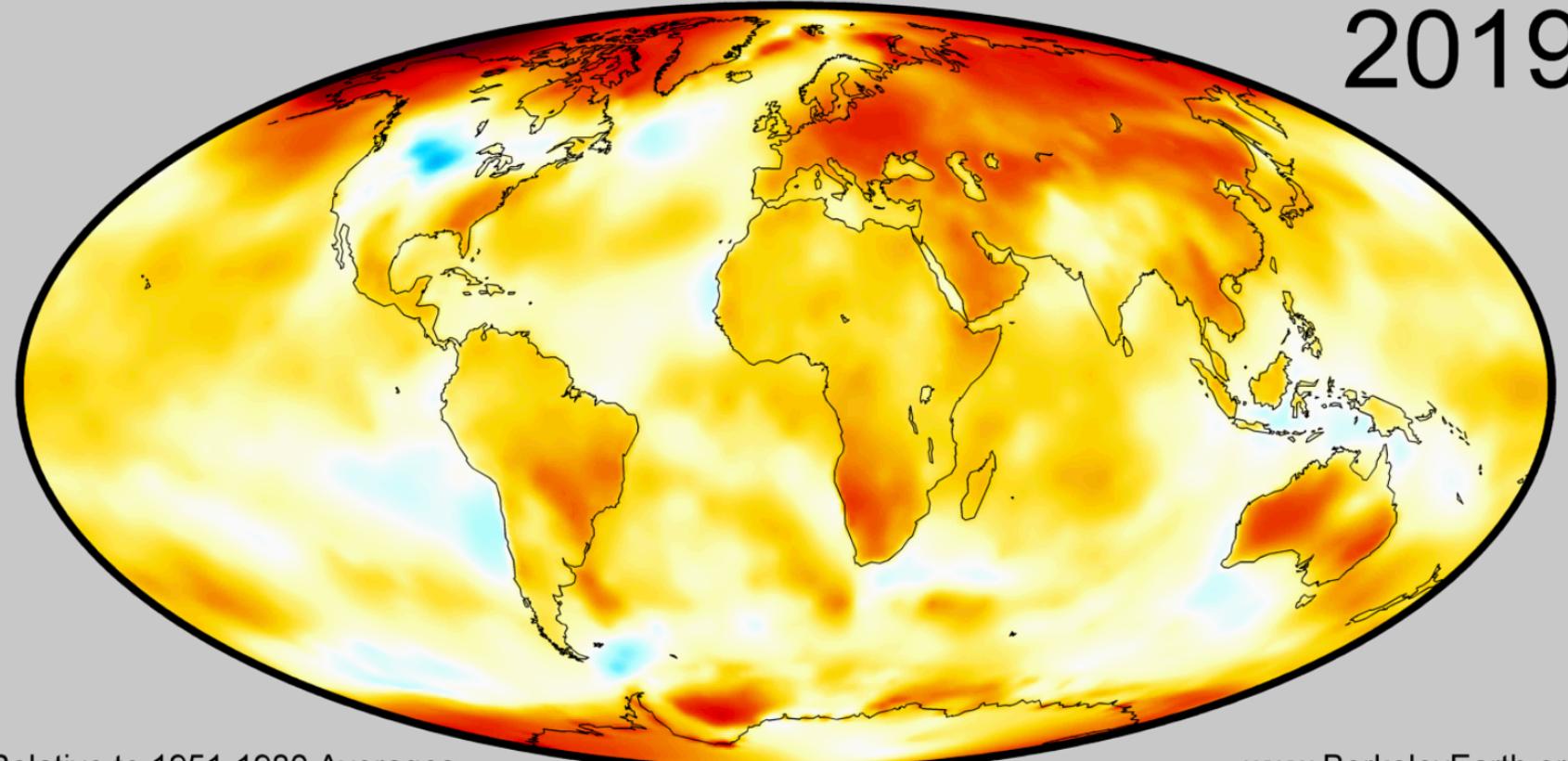
http://www.columbia.edu/~jeh1/mailings/2018/20181206_Nutshell.pdf



Going back 800 000 years, temperature and CO₂ have gone up and down in lockstep. Since the industrial revolution, CO₂ has skyrocketed. Temperature is going with it.

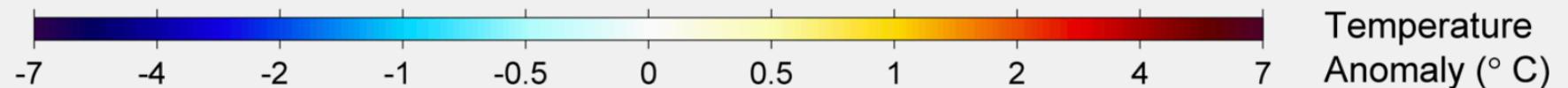


2019



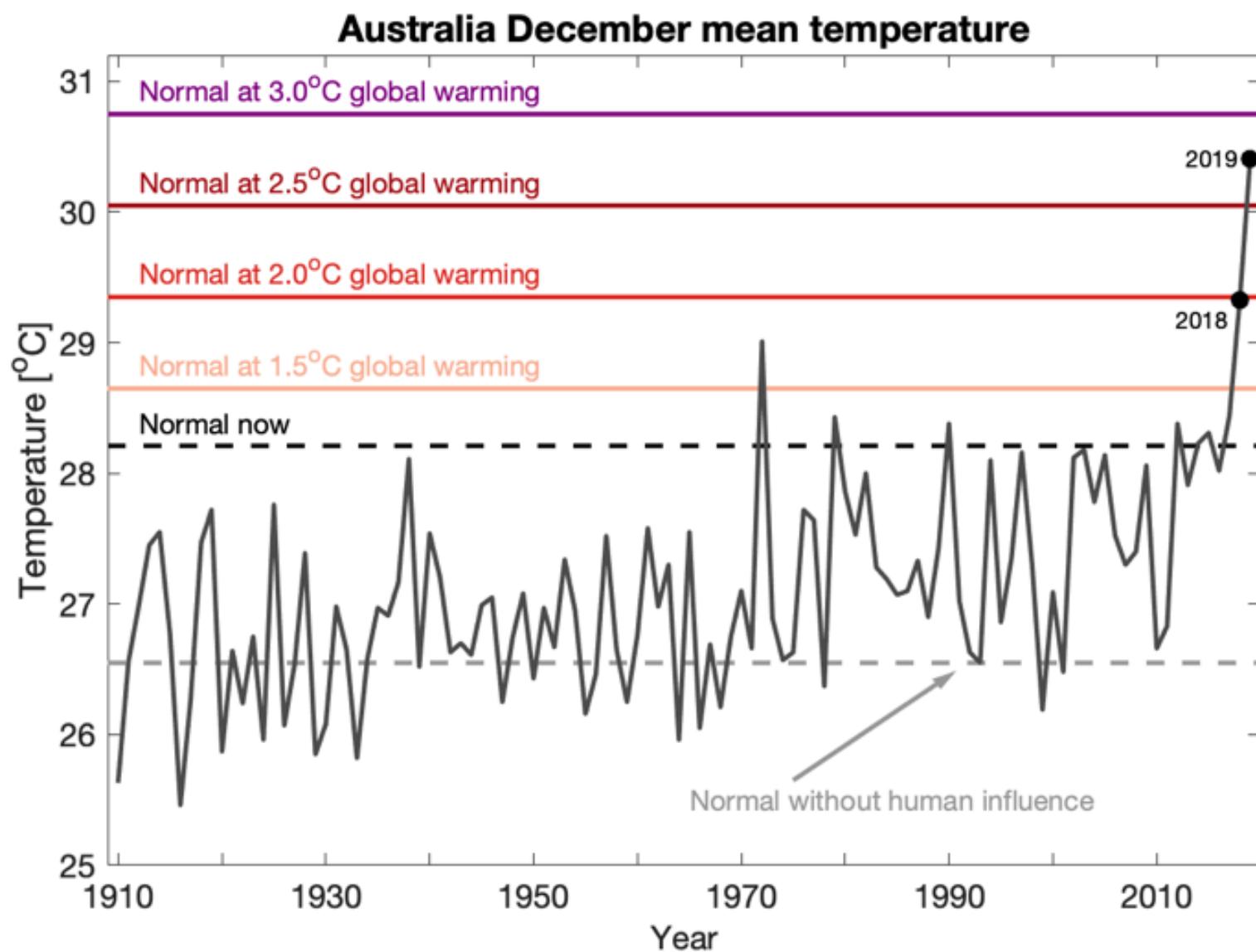
Relative to 1951-1980 Averages

www.BerkeleyEarth.org





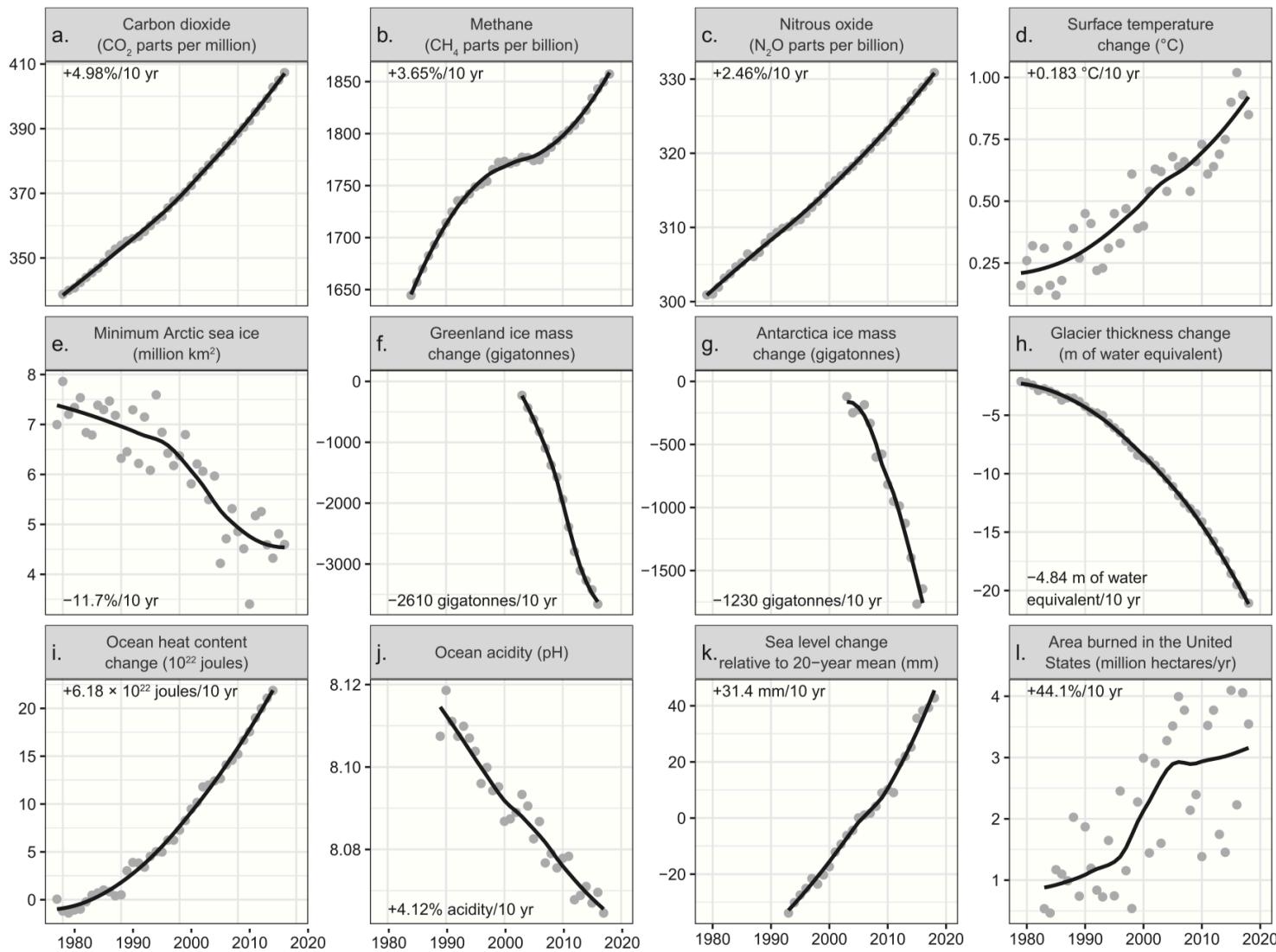




Recent publication by
11,263 climate scientists
shows that **the earth and
biosphere is blinking red**
on every indicator

<https://academic.oup.com/bioscience/advance-article/doi/10.1093/biosci/biz088/5610806>

Since 1979



California Impacts

Dec 5th 2019

VOTERS Dec 8th 2019



Hit by fires and droughts, California voters call climate change their top issue. Pummeled by the impacts of severe weather, California Democrats list climate change as the top issue they want their presidential nominee ... [latimes.com](#)

HOUSING INSURANCE WOES COMING

People at UC: if you live near a canyon or wilderness, get ready to lose your housing insurance or have escalating premiums. New research shows that the wildfires of 2017 and 2018 alone wiped out a full quarter-century of the industry's profits. [@nytimes tinyurl.com/rharv42](#)



DATA: In Sacramento, number of days extreme heat will quadruple by about 2035.
How will we recruit and retain faculty?

Average number of Extreme Heat Days. [i](#)

OBSERVED HISTORICAL 1961–1990	MODEL HISTORICAL 1961–1990	MODEL PROJECTIONS 2031–2041
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4	4	17
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1961 1990

1961 1990

2020 2041

<https://cal-adapt.org/tools/extreme-heat/>

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The theory of change

What UCSD and the wider UC must do soon

Time is running out to prevent an escalating catastrophe

IPCC 2018: a consensus report, ratified by the world's governments:

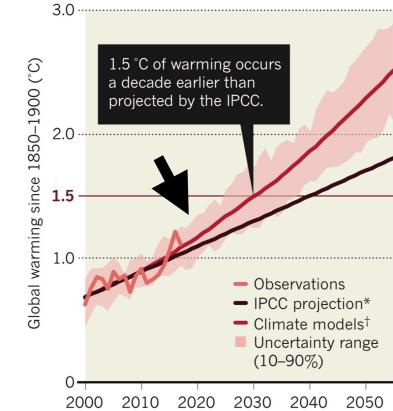
If we cut emissions about 50% by 2030 we have a 67% chance of limiting heating to 1.5 degree C

Any success will immediately show as reduced CO₂, not all heating that is baked into pipeline has to happen

Every ½ degree C we stave off is huge: 1.5 vs. 2 C is massive...

And then there is the very serious worry about tipping points ...

<https://www.nature.com/articles/d41586-019-03595-0>



RAISING THE ALARM

Evidence that tipping points are under way has mounted in the past decade. Domino effects have also been proposed.



A. Amazon rainforest
Frequent droughts

B. Arctic sea ice
Reduction in area

C. Atlantic circulation
In slowdown since
1950s

D. Boreal forest
Fires and pests
changing

F. Coral reefs
Large-scale die-offs

G. Greenland ice sheet
Ice loss accelerating

H. Permafrost
Thawing

I. West Antarctic
ice sheet
Ice loss accelerating

J. Wilkes Basin,
East Antarctica
Ice loss accelerating

©nature

Source: T. M. Lenton et al.

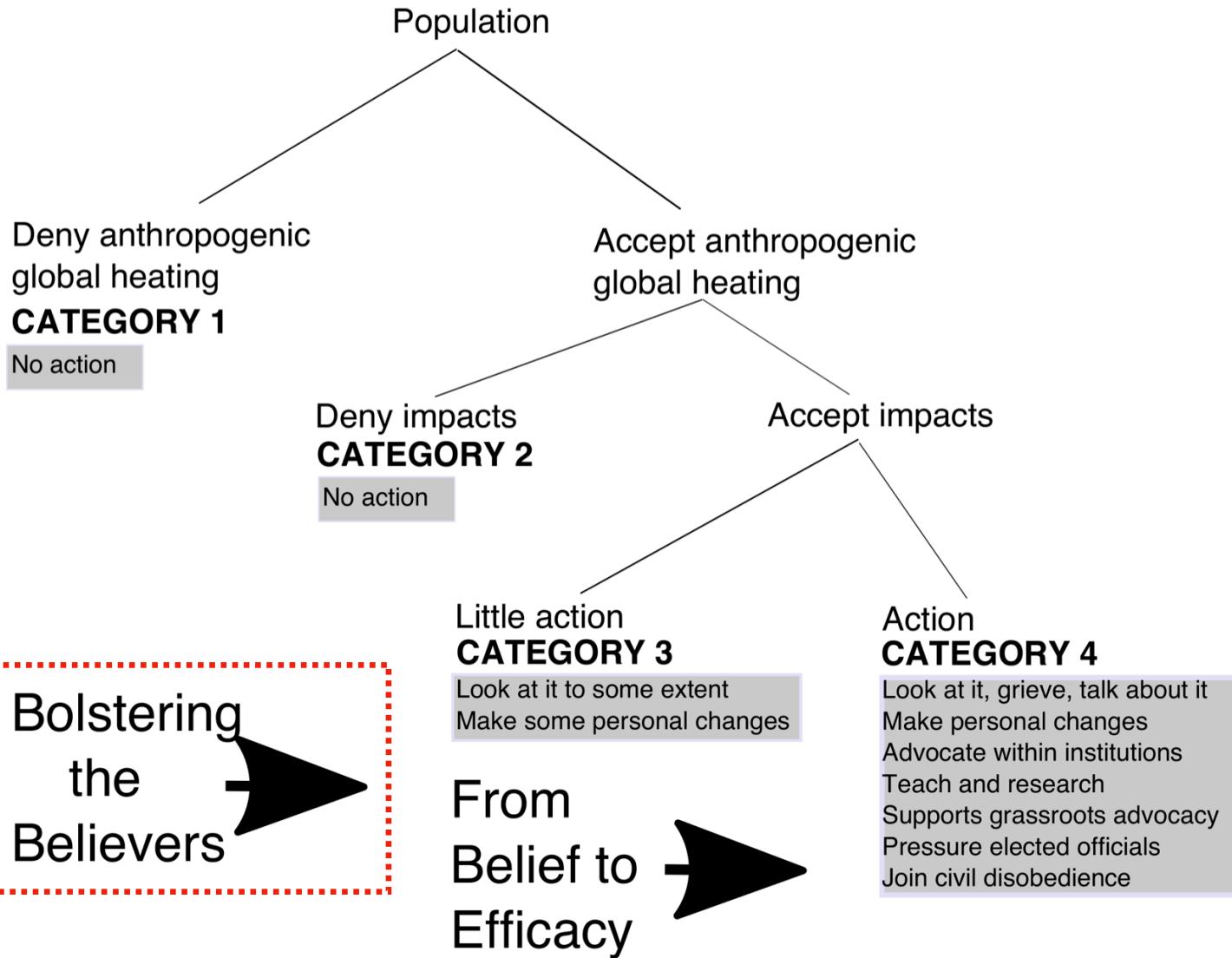
Dec 4th 2019

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Why aren't we acting?



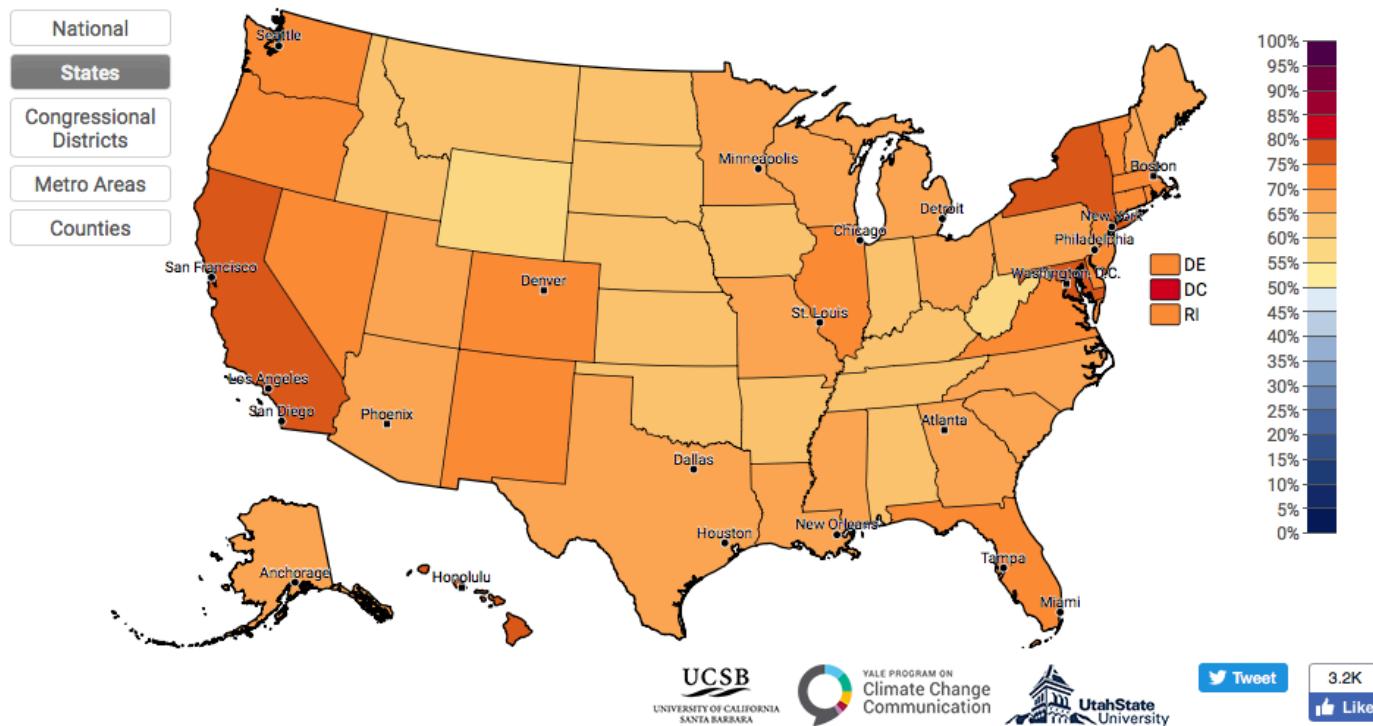
Outline

- **Climate change in the American mind**
- **Science Communication**
 - 1. Cultural cognition and the motivated rejection of science
 - 2. Communicating mechanism
 - 3. Communicating uncertainty
 - 4. Communicating threat/risk
 - a. Theoretical accounts
 - b. Practical research
 - c. Journalism/media
 - d. Cultural modes
- **Caveat: theory of change - budging belief may not be enough**

Estimated % of adults who think global warming is happening, 2018

Select Question: Global warming is happening
Click on map to select geography, or: Select a State

[Permalink](#)

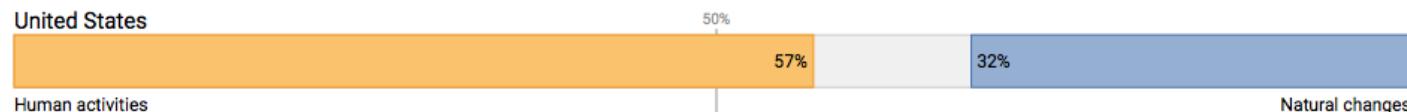
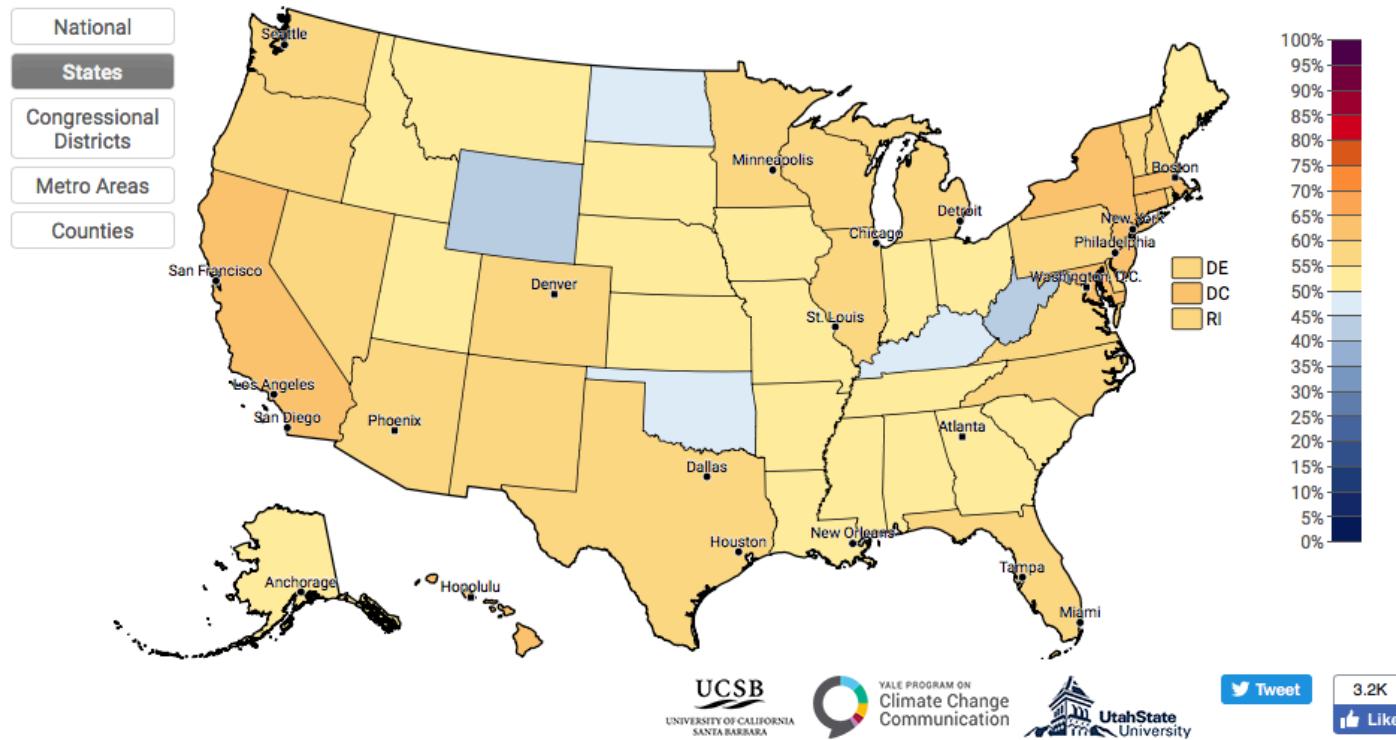


United States



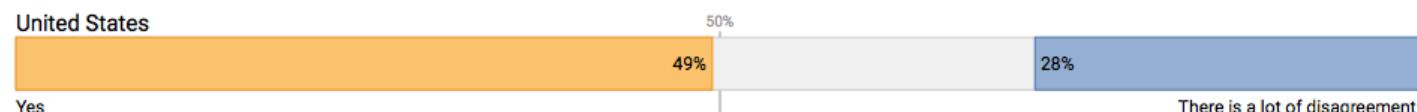
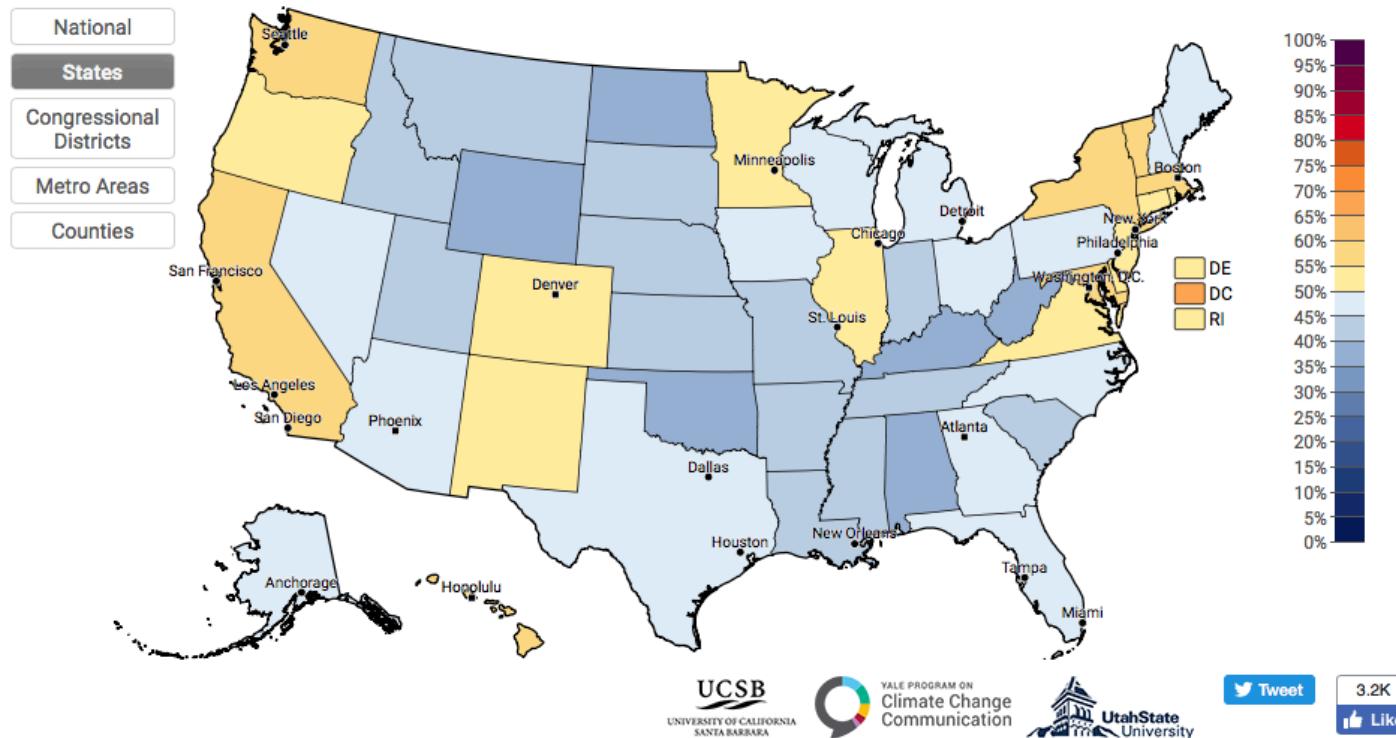
Estimated % of adults who think global warming is mostly caused by human activities, 2018

Select Question: Global warming is caused mostly by human activities Absolute Value [Permalink](#)
Click on map to select geography, or: [Select a State](#)



Estimated % of adults who believe most scientists think global warming is happening, 2018

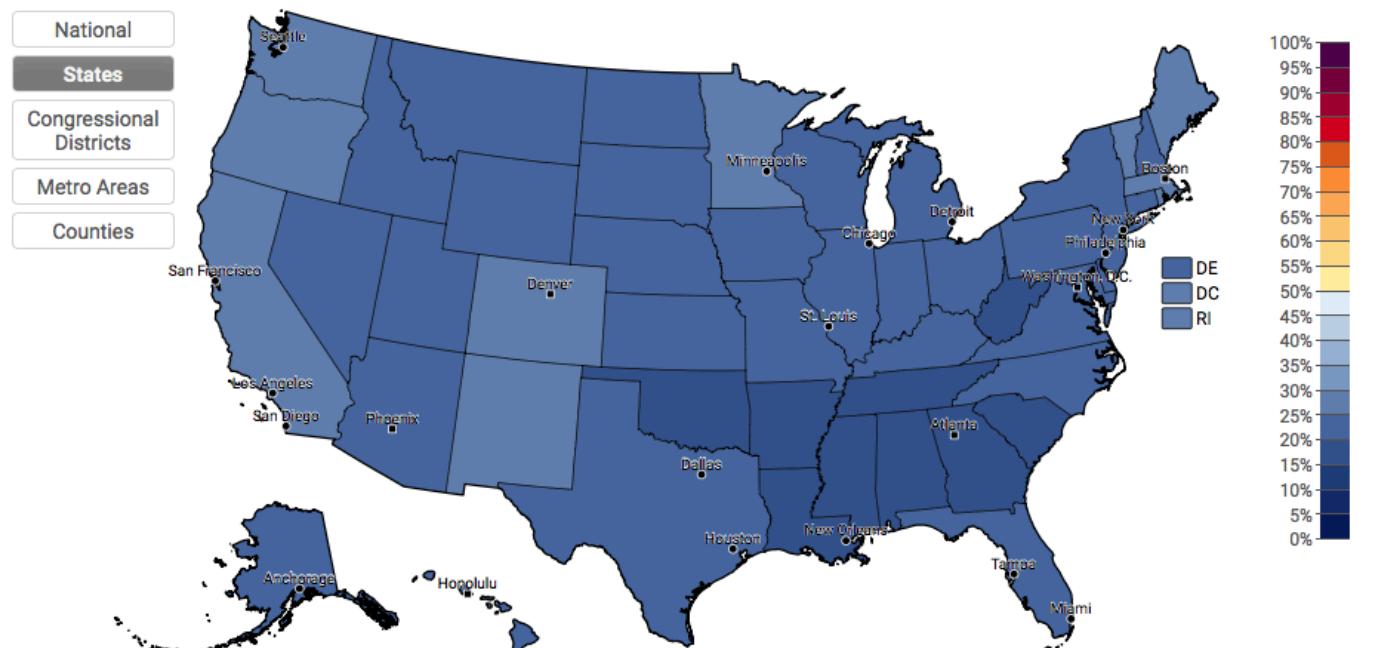
Select Question: Most scientists think global warming is happening Absolute Value Permalink
Click on map to select geography, or: Select a State



Estimated % of adults who hear about global warming in the media at least once a week, 2018

Select Question: Hear about global warming in the media at least once a week ▼ Absolute Value ▼ Permalink

Click on map to select geography, or: Select a State ▼



United States

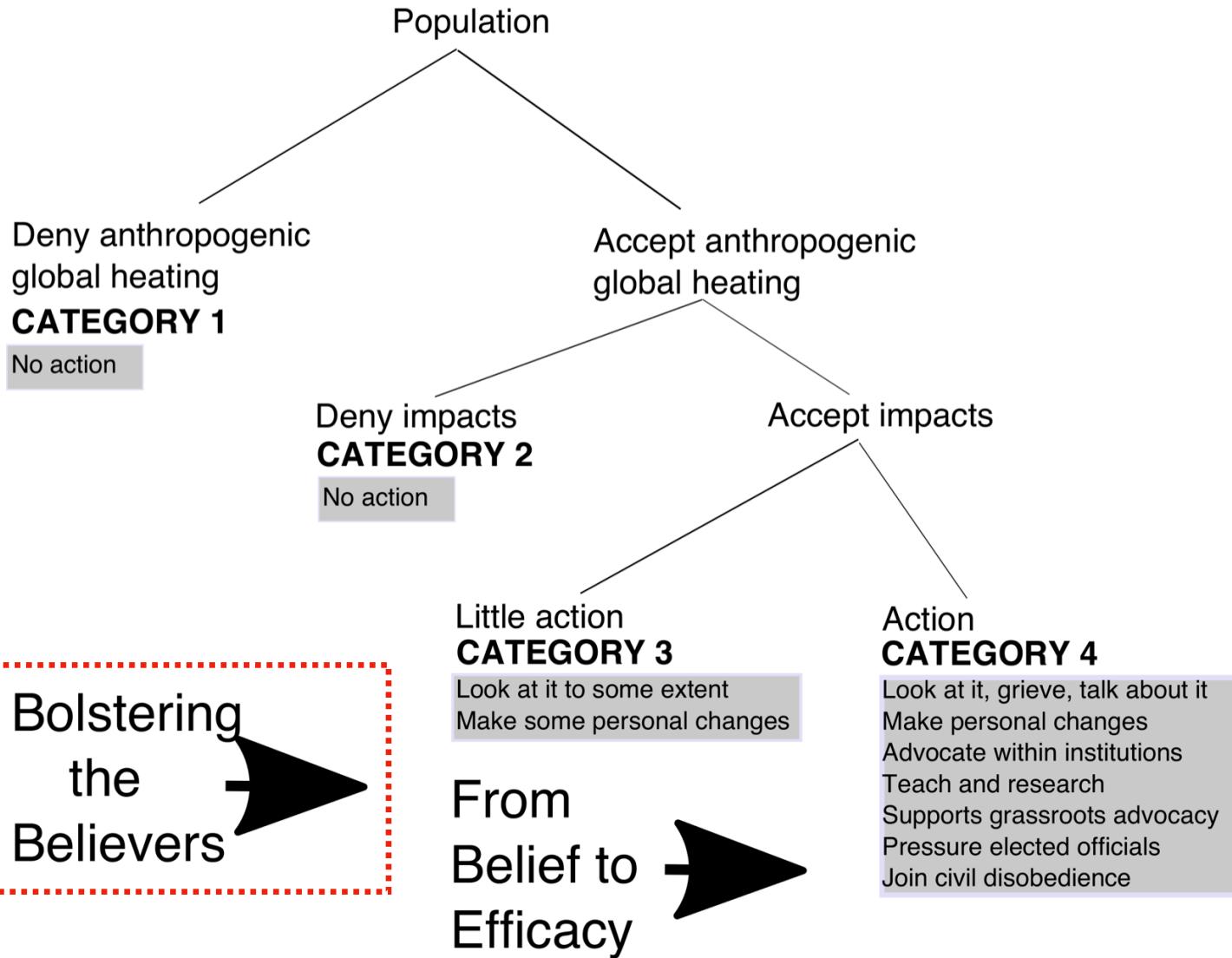
22%

77%

50%

At least weekly

Once a month or less often



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Attitude Roots and Jiu Jitsu Persuasion: Understanding and Overcoming the Motivated Rejection of Science

Matthew J. Hornsey and Kelly S. Fielding
University of Queensland, Australia

Fixing the communications failure

People's grasp of scientific debates can improve if communicators build on the fact that cultural values influence what and whom we believe, says **Dan Kahan**.

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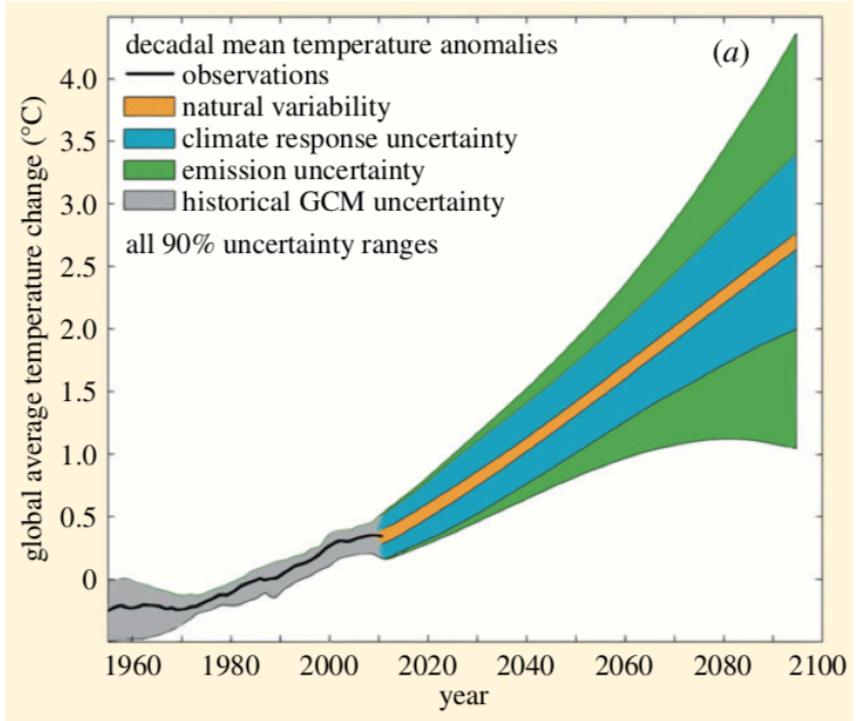
Climate Change Conceptual Change: Scientific Information Can Transform Attitudes

Michael Andrew Ranney,^a Dav Clark^b

Weisman, K., & Markman, E.M. (2017). Theory-based explanation as intervention.
Psychonomic Bulletin and Review, 24(5), 1555-1562.

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ROYAL SOCIETY OPEN SCIENCE

royalsocietypublishing.org/journal/rsos

Review



Cite this article: van der Bles AM, van der Linden S, Freeman ALJ, Mitchell J, Galvao AB, Zaval L, Spiegelhalter DJ. 2019 Communicating uncertainty about facts, numbers and science. *R. Soc. open sci.* **6**: 181870.

<http://dx.doi.org/10.1098/rsos.181870>

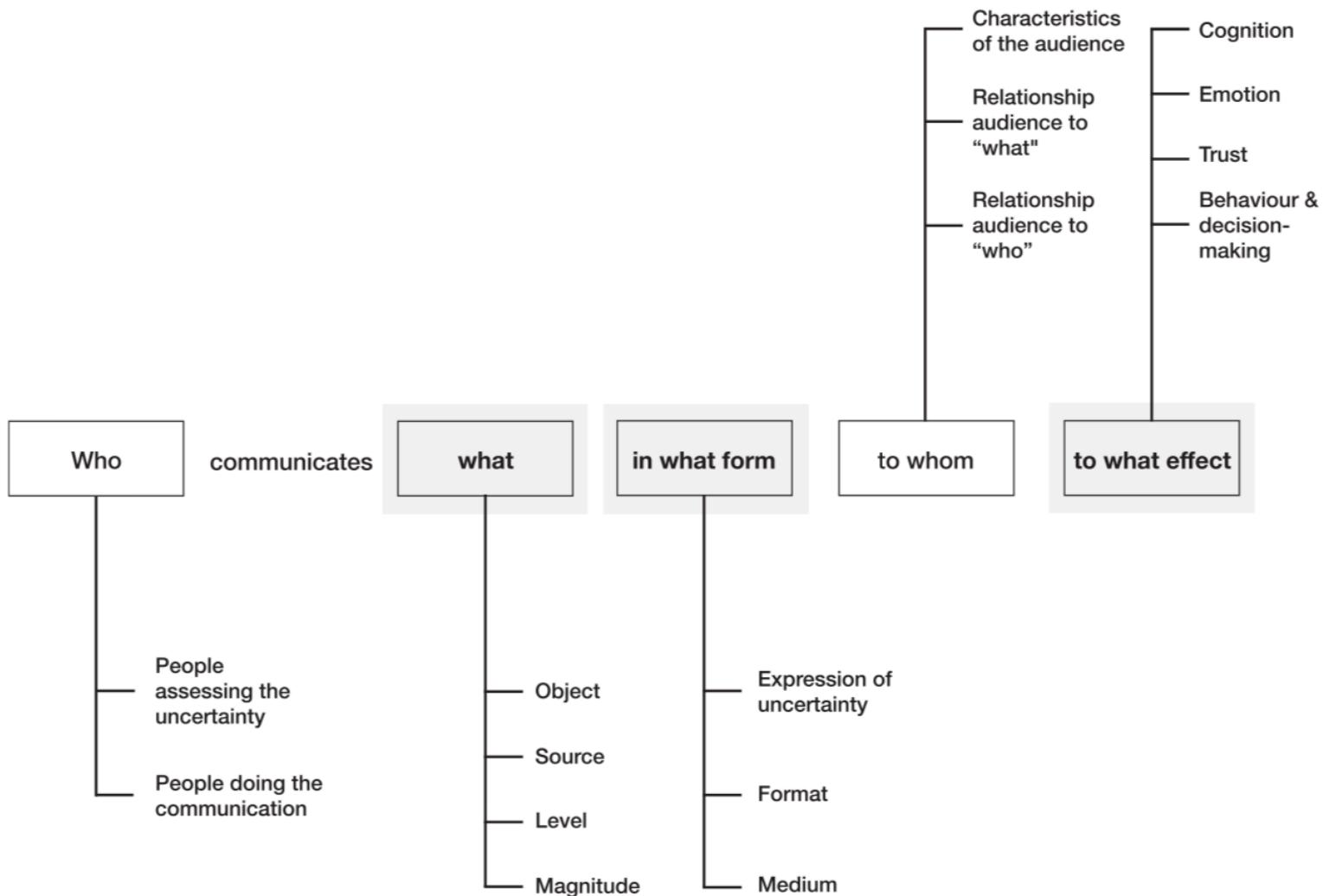
Communicating uncertainty about facts, numbers and science

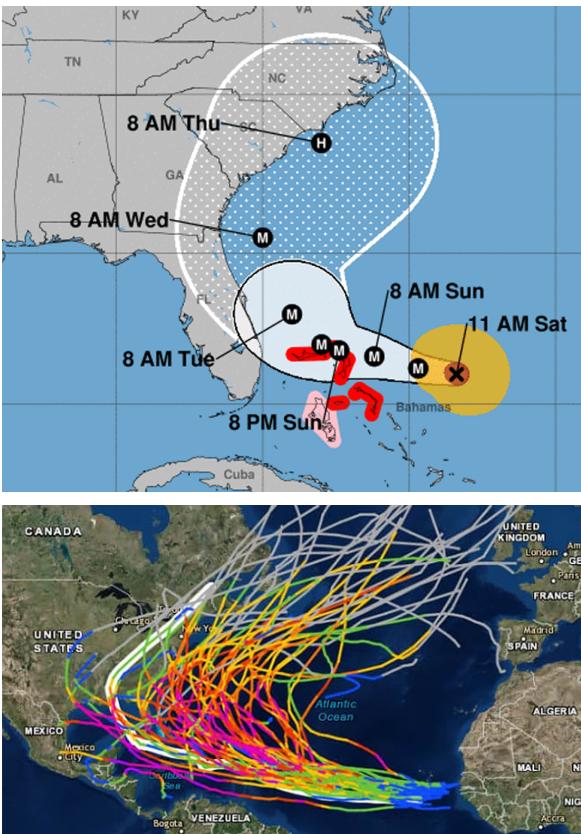
Anne Marthe van der Bles^{1,2}, Sander van der Linden^{1,2},
Alexandra L. J. Freeman¹, James Mitchell³,
Ana B. Galvao³, Lisa Zaval⁴ and David J. Spiegelhalter¹

¹Winton Centre for Risk and Evidence Communication, Department of Pure Mathematics and Mathematical Statistics, and ²Cambridge Social Decision-Making Lab, Department of Psychology, University of Cambridge, Cambridge, UK

³Warwick Business School, University of Warwick, Coventry, UK

⁴Department of Psychology, Columbia University, New York, NY, USA





A broader topic in cognitive psychology - visual representation

Visual Thinking Lab 

We study visual thinking: how it works, and how education + design can make it work better.

About

We study how leveraging the visual system - the largest single system in your brain - can help people think, remember, and communicate more efficiently. Our basic research is inspired by real-world problems, guiding our laboratory toward the most interesting basic research questions, while producing results that translate directly to science, education, business, & design.

News

Dr. Miriam Novack receives an NIH NRSA grant to study attention in infants. 



MATTHEW CRESLAD
DANIEL FREDRIKSSON
DR. MIRIAM NOVACK
JORDAN PEARCE
JULIA RUMBLE
KATHLEEN SCHAFFNER
KATIE SPERBER
MELISSA TAYLOR
NICHOLAS VITALE

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**EXPERIENCE-BASED AND DESCRIPTION-BASED PERCEPTIONS
OF LONG-TERM RISK: WHY GLOBAL WARMING DOES NOT
SCARE US (YET)**

ELKE U. WEBER

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When do extreme weather events generate attention to climate change?

Matthew R. Sisco¹ • Valentina Bosetti^{2,3} • Elke U. Weber⁴

Outline

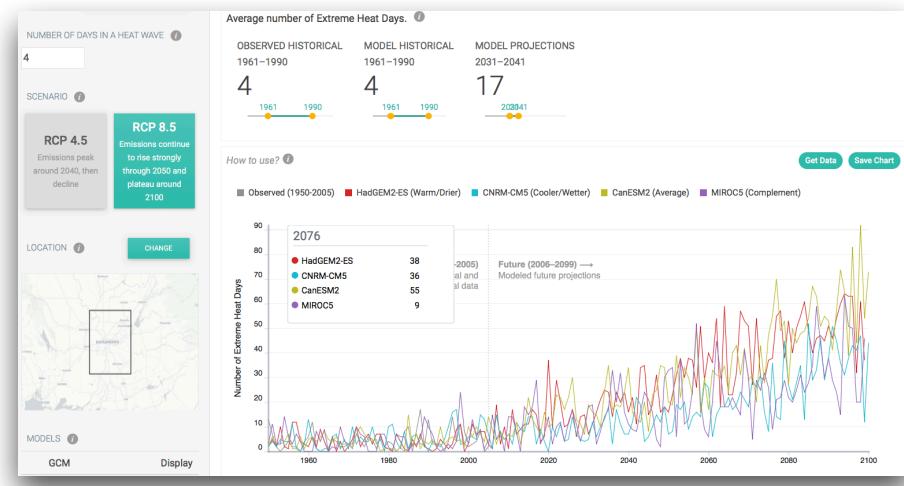
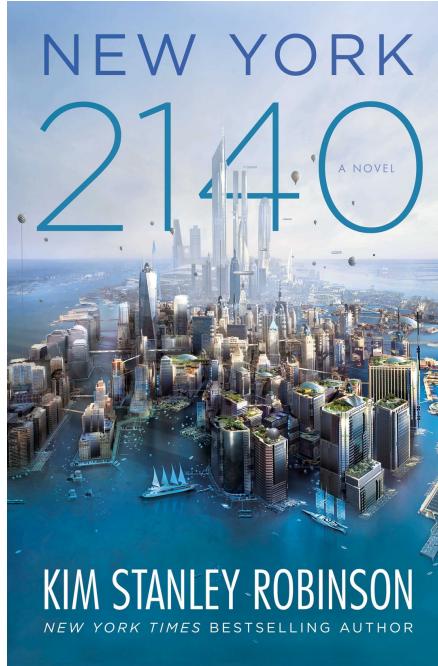
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The
Uninhabitable
Earth
Life After Warming
David
Wallace-Wells



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Table 2. Audience segments and the climate change-related dimensions.

	Alarmed activists	Concerned activists	Cautious	Disengaged	Doubtful
N (% of sample)	459 (24%)	345 (18%)	543 (28%)	389 (20%)	201 (10%)
Concern about climate change	0.41	0.13	0.16	0.18	-1.60
Environmental concern	0.45	-0.02	-0.14	-0.19	0.33
Car use	0.05	-0.04	0.49	-0.39	0.26
Abstention from longer car/plane journeys	0.61	0.30	-0.65	0.45	-0.15
Eco-power	-0.42	1.75	-0.37	-0.34	-0.12
Political activism on energy issues	0.61	0.28	0.30	-0.93	-0.48

70% extremely or very or somewhat worried, 2015

**Global warming's five Germanys:
A typology of Germans' views on
climate change and patterns of
media use and information**

Public Understanding of Science
I-18
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sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/0963662515592558
pus.sagepub.com


Julia Metag, Tobias Füchslin and Mike S. Schäfer
University of Zurich, Switzerland

But 30 km from Cologne



Climate change performance index

Ranking for 2019, selection of countries,
EU listed separately as party to Paris Agreement

	Ranking 2018	GHG emissions	Renewables	Energy use	Policy
Sweden	4	4	↗	↗	↓
Morocco	5	6	↗	→	↑
Great Britain	8	8	↗	→	→
Switzerland	9	12	↗	→	↘
India	11	14	↗	→	↗
EU	16	21	→	→	→
France	21	15	→	↘	→
Brazil	22	19	→	↗	↗
Mexico	25	27	→	↘	↗
Germany	27	22	↘	→	↘
China	33	41	↓	→	↓
Russia	52	53	↘	↓	↘
Australia	55	57	↓	↘	↓
United States	59	56	↓	↘	↓

↑ much better

↓ worse

Machines dig for brown coal at the Garzweiler mine in front of a smoking power plant near the city of Grevenbroich in western Germany. (Martin Meissner / Associated Press)

The Second European Heatwave of 2019

Weather /

Temperature records tumble as heatwave sears Europe

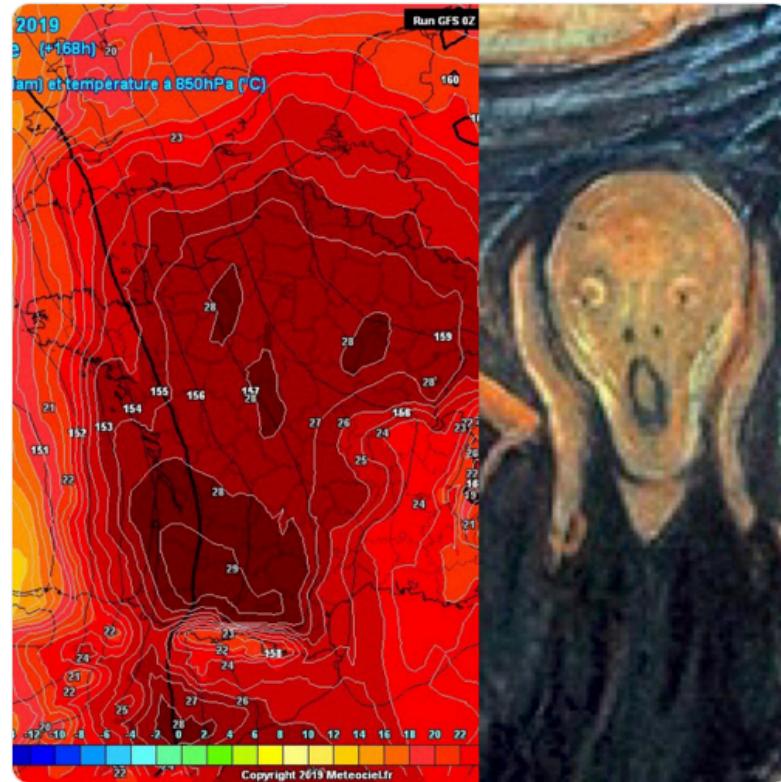
Higns in Germany, Netherlands and Belgium exceeded for second time in 24 hours

UK weather Climate fears as Britain has second hottest day on record



UK railways Chaos as searing heat sparks fear of derailed trains

Christmas turkeys Heatwave in Europe could lead to UK shortage



Temperatures as high as 112 Fahrenheit were recorded in France and Northern Germany

The European Parliament Elections of 2019

Los Angeles Times

WORLD & NATION

How climate change transformed Germany's Greens into the country's most popular political party



In a file photo from April 2019, a bicyclist in Berlin passes election campaign posters for the Left (die Linke) party and the Greens party (poster at right) during campaigning for the recent European Parliament elections. (Hayoung Jeon / EPA/Shutterstock)

By ERIK KIRSCHBAUM JUNE 12, 2019 | 11:14 AM

Canada ...

Trudeau Declares Climate Emergency... Then Approves Major Oil Pipeline

By [Nick Cunningham](#) - Jun 19, 2019, 6:00 PM CDT



Canada [declared](#) a national climate emergency on Monday. The next day, Prime Minister Justin Trudeau gave the greenlight to a massive oil sands pipeline.

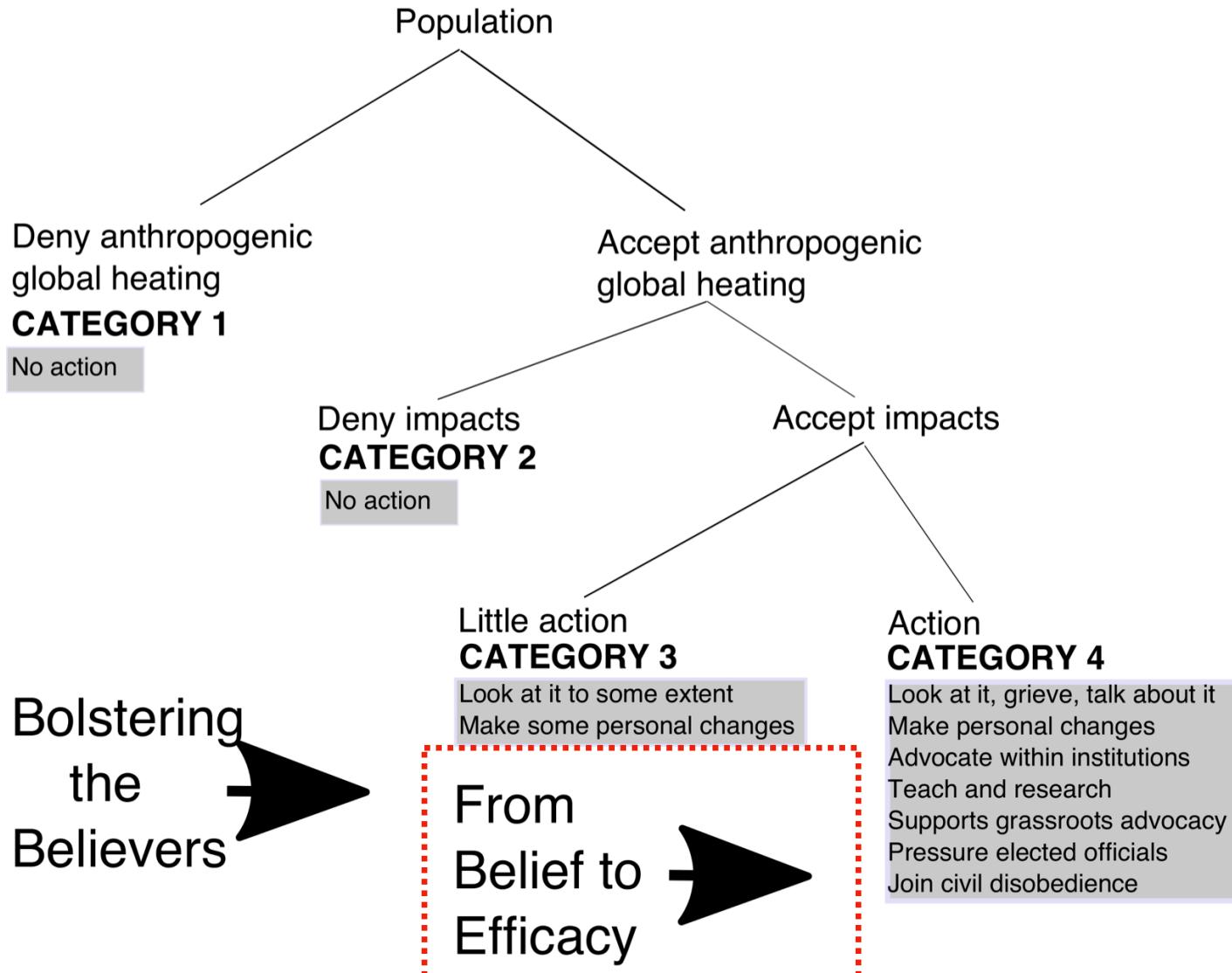
Obama



CASHING IN ON ALL OF THE ABOVE:
U.S. FOSSIL FUEL PRODUCTION
SUBSIDIES UNDER OBAMA

Since President Obama took office in 2009, federal fossil fuel subsidies have grown in value by 45 percent, from \$12.7 billion to a current total of \$18.5 billion. This rise is mostly due to increased oil and gas production: the value of tax breaks and other incentives has increased along with greater production and profits, essentially rewarding companies for accelerating climate change.

What can be done?



Our predicament

The urgency

The theory of change

Political systems are current simply incapable of decarbonizing

We cannot wait, we must act collectively where we are. UC is the biggest employer in the 5th biggest economy in the world.

Our predicament

The urgency

The theory of change

What UCSD and ... and the wider UC must do soon

DECARBONIZE IT

Electricity, transportation, aviation

- Our actions will reverberate.
- Our actions are in our control.
- We have a moral responsibility to each other, our families ...

Ultimately grassroots actions will percolate politically.

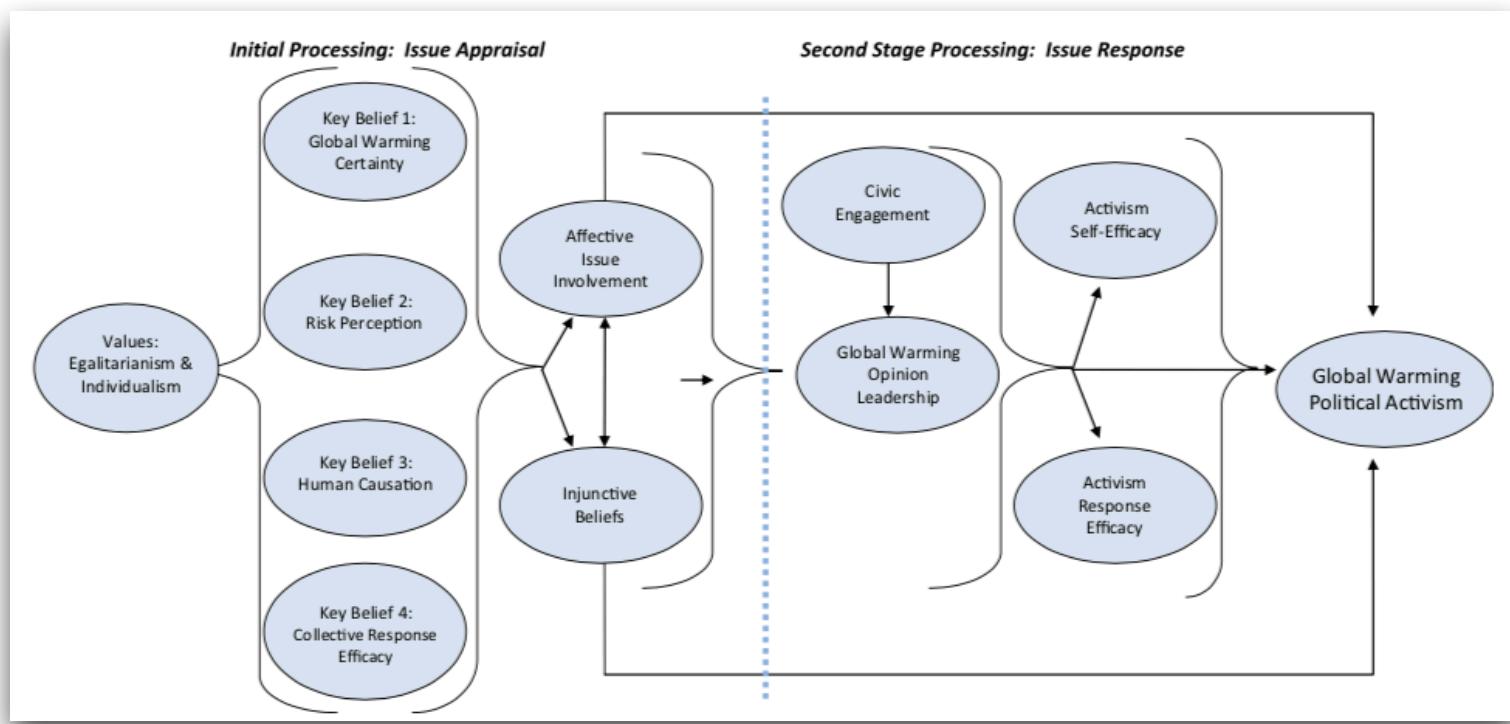
Why isn't this happening?

The genesis of climate change activism: from key belief to political action

Connie Roser-Renouf · Edward W. Maibach ·
Anthony Leiserowitz · Xiaoquan Zhao

Activism is constrained by public beliefs

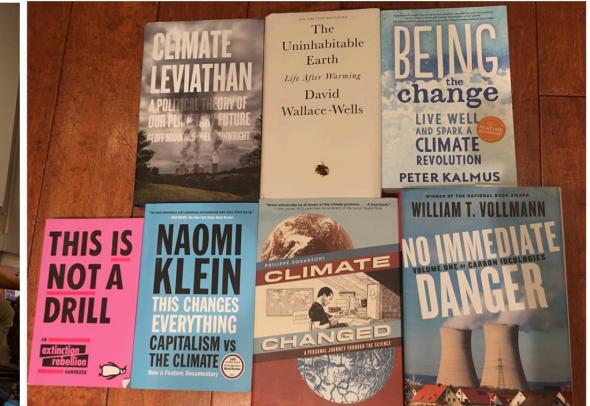
- a) About AGW
- b) About the effectiveness of political activism



A growing campus movement is going to push us whether we like it or not.



Sept 27 2019 climate action march at UCSD
~500 marched and rallied
This will swell to thousands

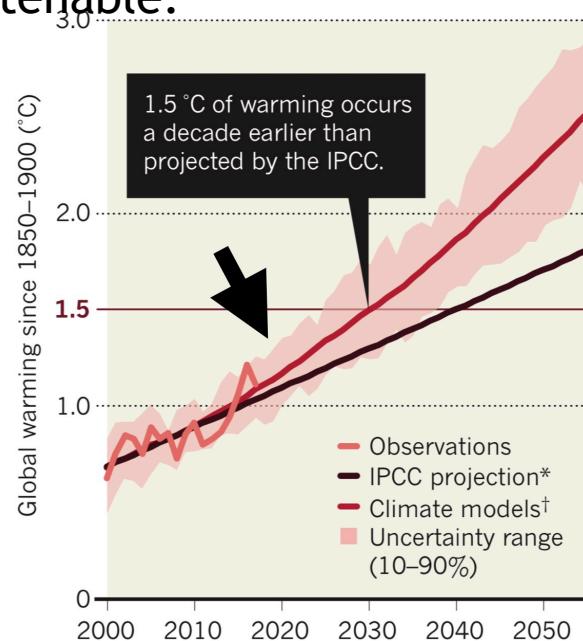


Dozens of UCSD students, postdocs, faculty, and staff got down to developing collective action campaigns on the climate crisis at this month's First Friday. Join the movement and join us next month. <https://ucsdgreennewdeal.net/>

UCSD Green New Deal student-led org
<https://ucsdgreennewdeal.net/>

Hope in Collective Action

We must help UC be part of the solution to reduce emissions soon. If not, we are morally culpable, failing each other, and our own families. We will witness a terrifying escalation that increasingly makes standard UC operations and life in California untenable.



We live in a time in which many people have no sense of **solidarity**. But all great social struggles have been won through **collective action**

"Hope locates itself in the premises that we don't know what will happen and that in the spaciousness of uncertainty there is room to act.

When you recognize uncertainty, you recognize that you may be able to influence the outcomes – you alone or you in concert with a few dozen or several million others.

– Rebecca Solnit