

Sustainability Leadership



Sustainability Leadership

Class 6:

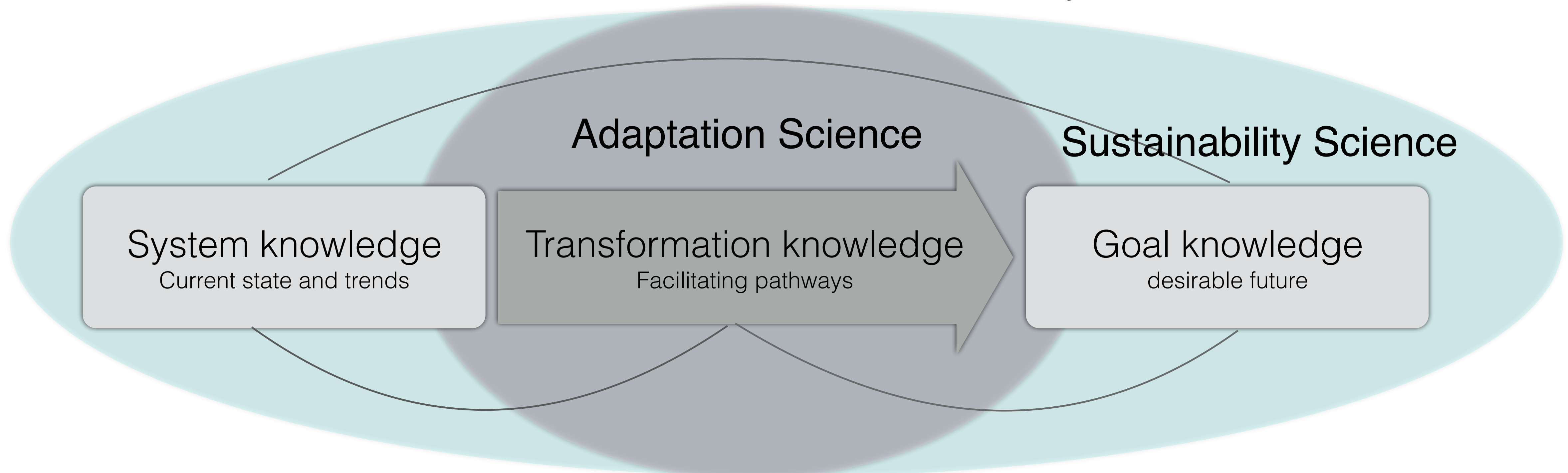
Part 1: Evidence-based leadership

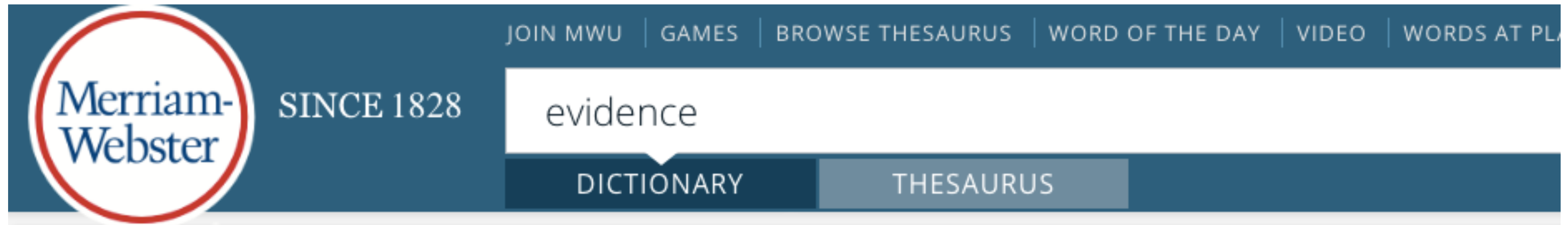
Part 2: Foresight



Foreseeability and Foresight:

- What might happen?
 - Possible threats and hazards
 - Knowing the system trajectory
 - What do we want to happen?
 - How can we impact the system trajectory?
- } System Knowledge
- } Goal Knowledge
- } Transformational Knowledge





Definition of EVIDENCE

- 1 **a** : an outward sign : [INDICATION](#)
 b : something that furnishes proof : [TESTIMONY](#); *specifically* : something legally submitted to a tribunal to ascertain the truth of a matter
- 2 : one who bears witness; *especially* : one who voluntarily confesses a crime and testifies for the prosecution against one's accomplices

—in evidence

- 1 : to be seen : [CONSPICUOUS](#)
 - trim lawns ... are everywhere *in evidence* —*Amer. Guide Series: N.C.*

- 2 : as evidence

Evidence related to the Earth's life-support system, societal processes, policies?

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Observations/Data

Evidence-based policy/decision making:

Term originated in the U.K. in the 1990-ties

Extension of the Scientific method or evidence-based medicine to all areas of public policy

Alternative: evidence-informed

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Methodology:

- Has a theory as to why the policy will be effective and what the impacts of the policy will be if it is successful;
- Includes a counterfactual: what would have occurred if the policy had not been implemented;
- Incorporates some measurement of the impact;
- Examines both direct and indirect effects that occur because of the policy;
- Separates the uncertainties and controls for other influences outside of the policy that may have an effect on the outcome;
- Should be able to be tested and replicated by a third party.

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Challenge for evidence-based policy/decision making:

- Which agreed-upon goals to prioritize?

Policy/Decision-based evidence making:

- working back from a predefined policy/decision to produce underpinning evidence;
- can be positive
- can be very biased and aim to control knowledge creation

Issues with evidence-based leadership:

Facts/evidence are often/always:

- incomplete,
- uncertain,
- outdated,
- wrong.
- (mis)interpreted.

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- Role of paradigms and immutable truths for the interpretation of evidence and facts.

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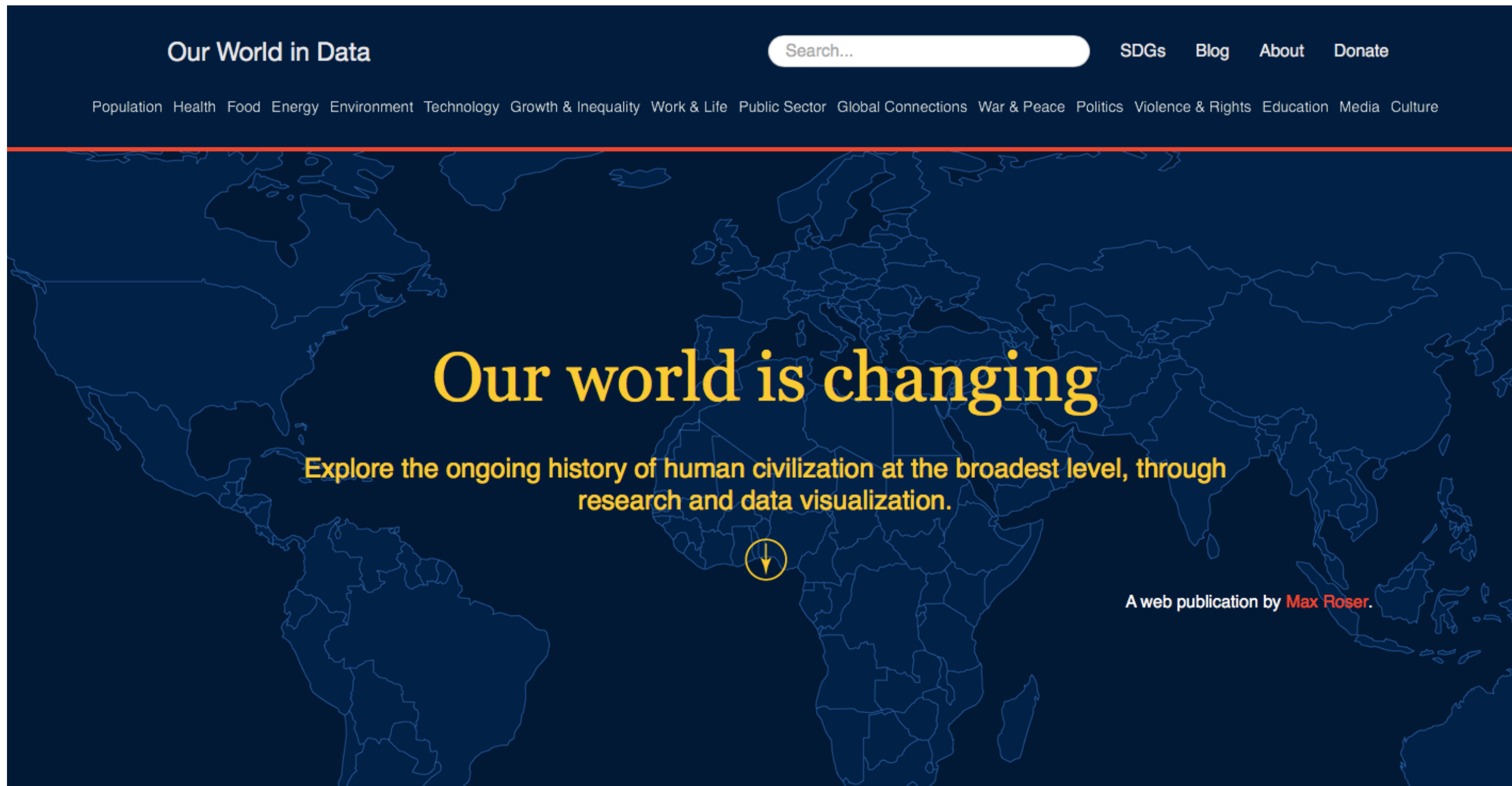
Trends, system trajectory:

- understand the problems of inductions,
- know the signal contents
- acknowledging the threats

Data availability, accessibility, usability, fit for purpose

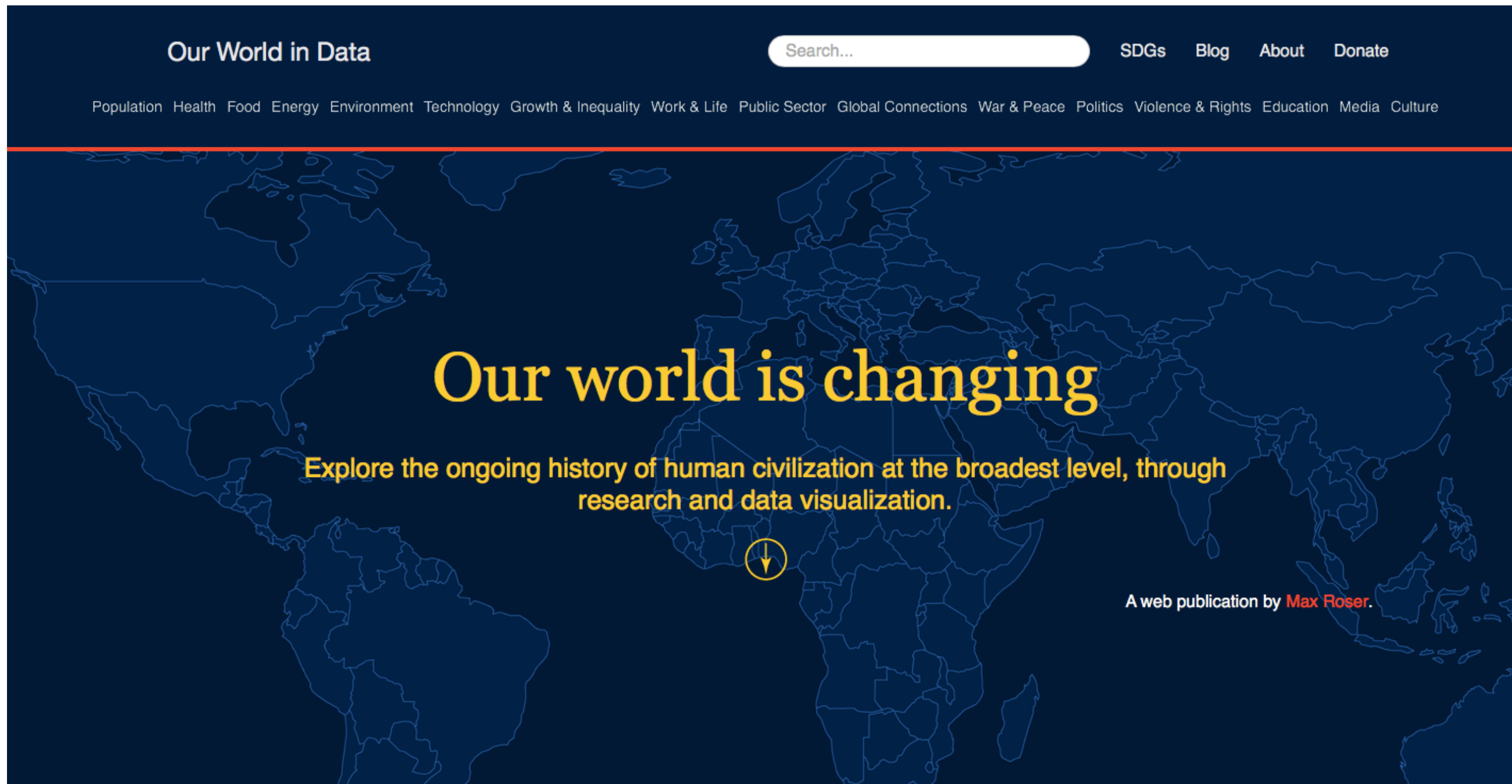
Evidence-Based Leadership

Data availability, accessibility, usability, fit for purpose



Evidence-Based Leadership

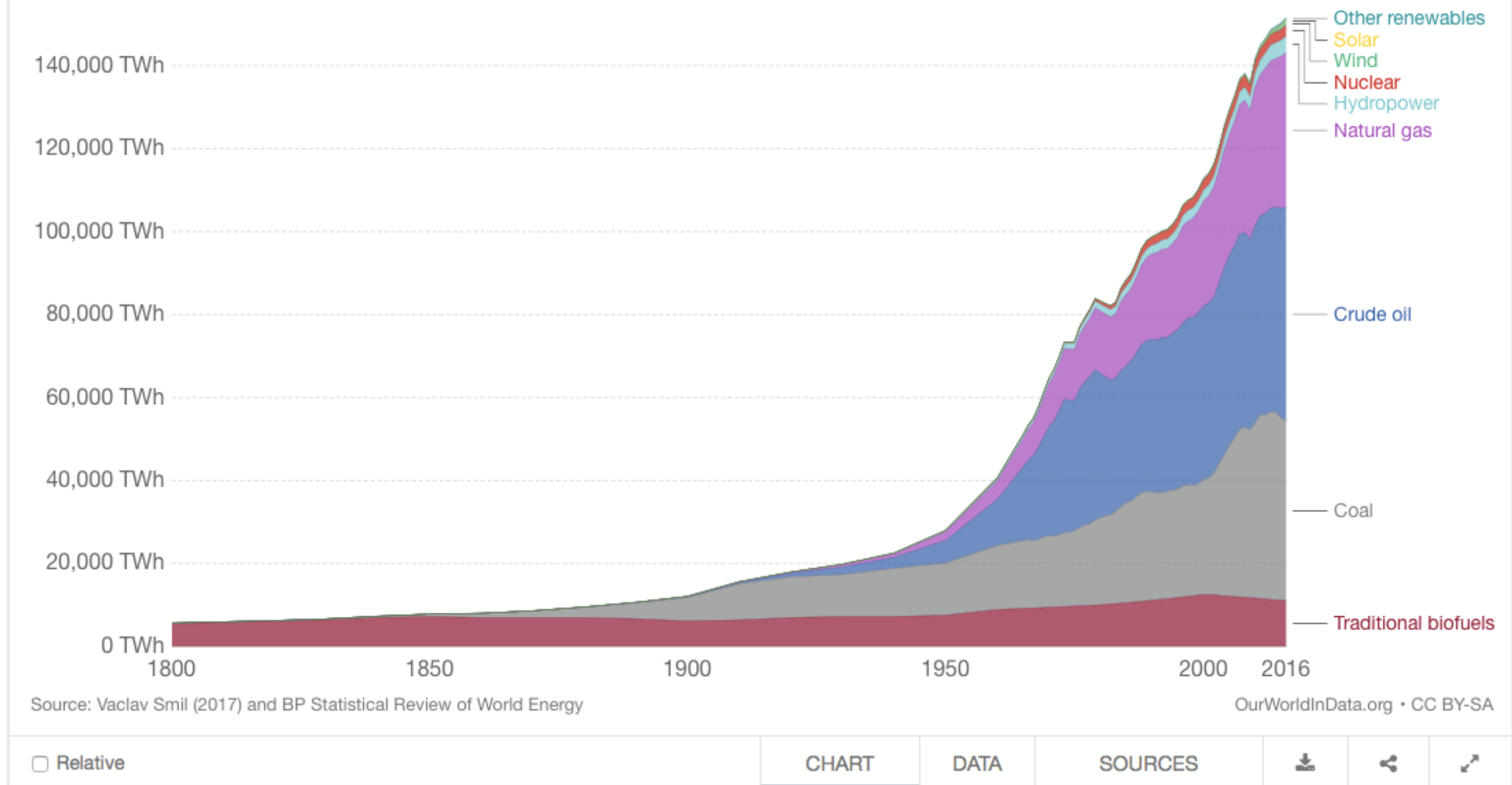
Data availability, accessibility, usability, fit for purpose



Latest Visualization

Global Primary Energy Consumption, World

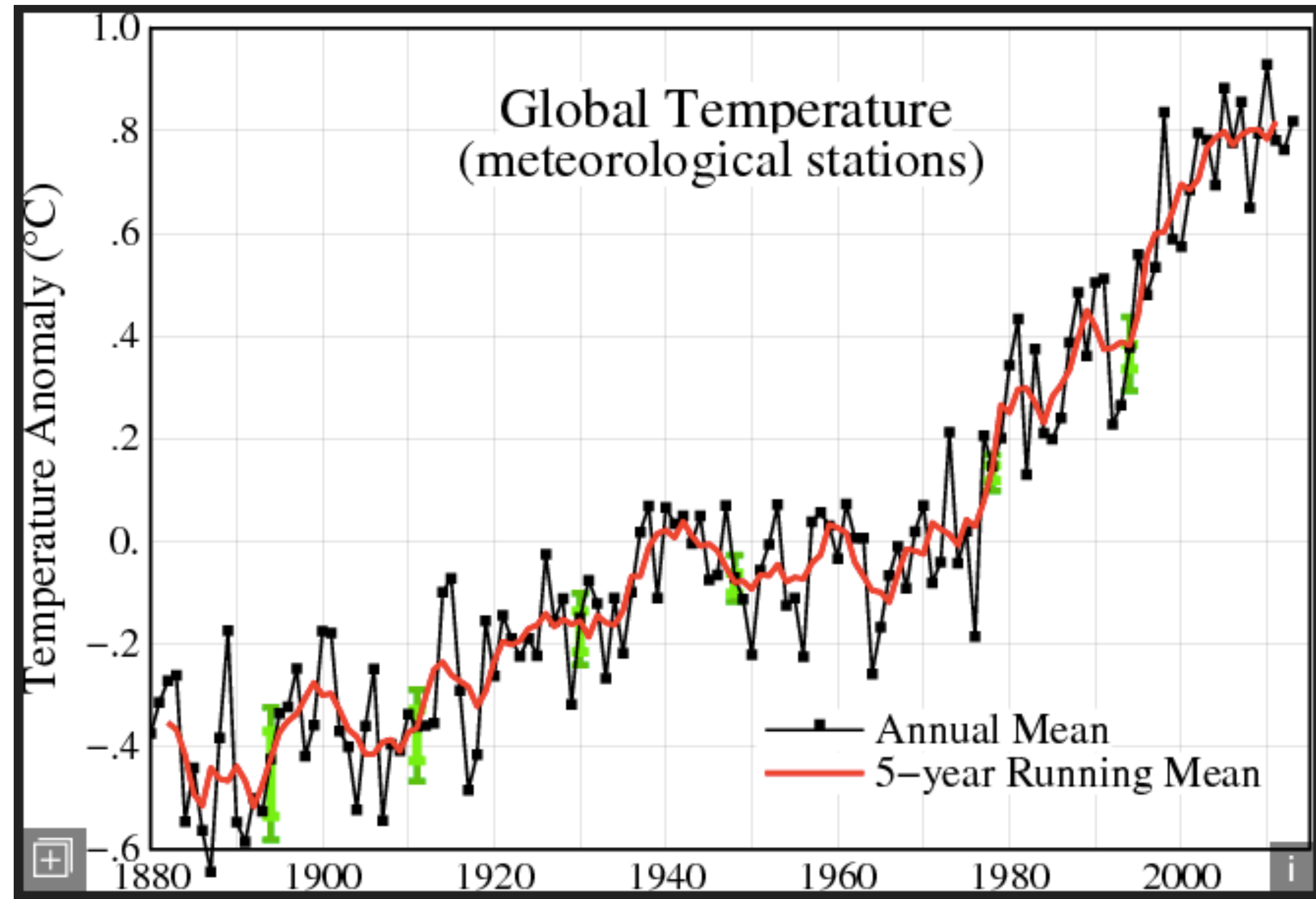
Global primary energy consumption, measured in terawatt-hours (TWh) per year. Here 'other renewables' are renewable technologies not including solar, wind, hydropower and traditional biofuels.



Interpretation of data:

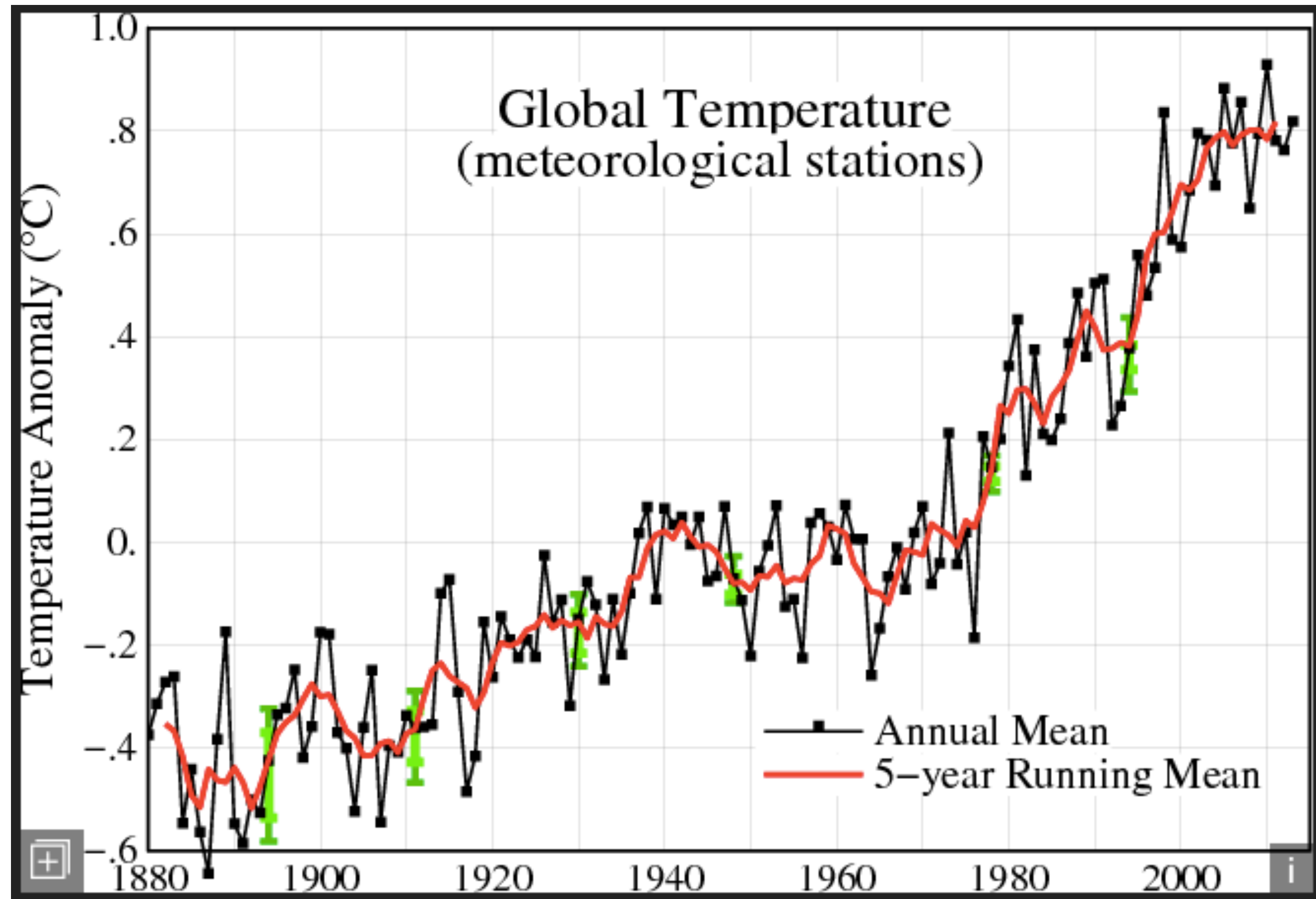
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Interpretation of data:



SCIENCE

Global Warming 'Hiatus' Challenged by NOAA Research

By JUSTIN GILLIS JUNE 4, 2015



Icebergs in Lallemand Fjord in Antarctica. In its research, the National Oceanic and Atmospheric Administration adjusted past data to account for new insights.

Kent Kobersteen/National Geographic Creative, via Corbis

Usability of Science

Usability of Science

Energy and Environment

Scientists say the pace of sea level rise has nearly tripled since 1990

By **Chris Mooney** May 22 



An iceberg is pictured in the western Antarctic peninsula in March 2016. (Eitan Abramovich/AFP/Getty Images)

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Proceedings of the National Academy of Sciences of the United States of America

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[Home](#) > [Early Edition](#) > Sönke Dangendorf, doi: 10.1073/pnas.1616007114

 Check for updates

Reassessment of 20th century global mean sea level rise

Sönke Dangendorf^{a,1}, Marta Marcos^b, Guy Wöppelmann^c, Clinton P. Conrad^d, Thomas Frederikse^e, and Riccardo Riva^e

[Author Affiliations](#) 

Edited by Anny Cazenave, Centre National d'Etudes Spatiales, Toulouse Cedex 9, France, and approved April 17, 2017 (received for review September 28, 2016)

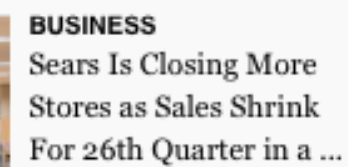
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Significance

Estimates of global mean sea level (GMSL) before the advent of satellite altimetry vary widely, mainly because of the uneven coverage and limited temporal sampling of tide gauge records, which track local sea level rather than the global mean. Here we introduce an approach that combines recent advances in solid Earth and geoid corrections for individual tide gauges with improved knowledge about their geographical representation of ocean internal variability. Our assessment yields smaller trends before 1990 than previously reported, leading to a larger overall acceleration; identifies three major explanations for differences with previous estimates; and reconciles observational GMSL estimates with the sum of individually modeled contributions from the Coupled Model Intercomparison Project 5 database for the entire 20th century.

THE WALL STREET JOURNAL.

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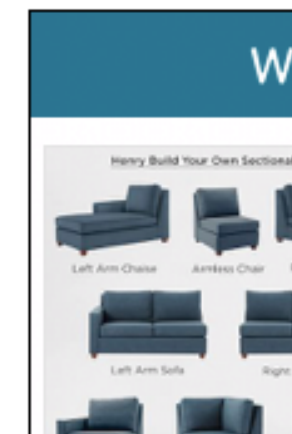


The Sea Is Rising, but Not Because of Climate Change

By Fred Singer

May 15, 2018 6:27 p.m. ET

Of all known and imagined consequences of climate change, many people fear sea-level rise most. But efforts to determine what causes seas to rise are marred by poor data and disagreements about methodology. The noted oceanographer Walter Munk referred to sea-level rise as an “enigma”; it has also been called a riddle and a puzzle.



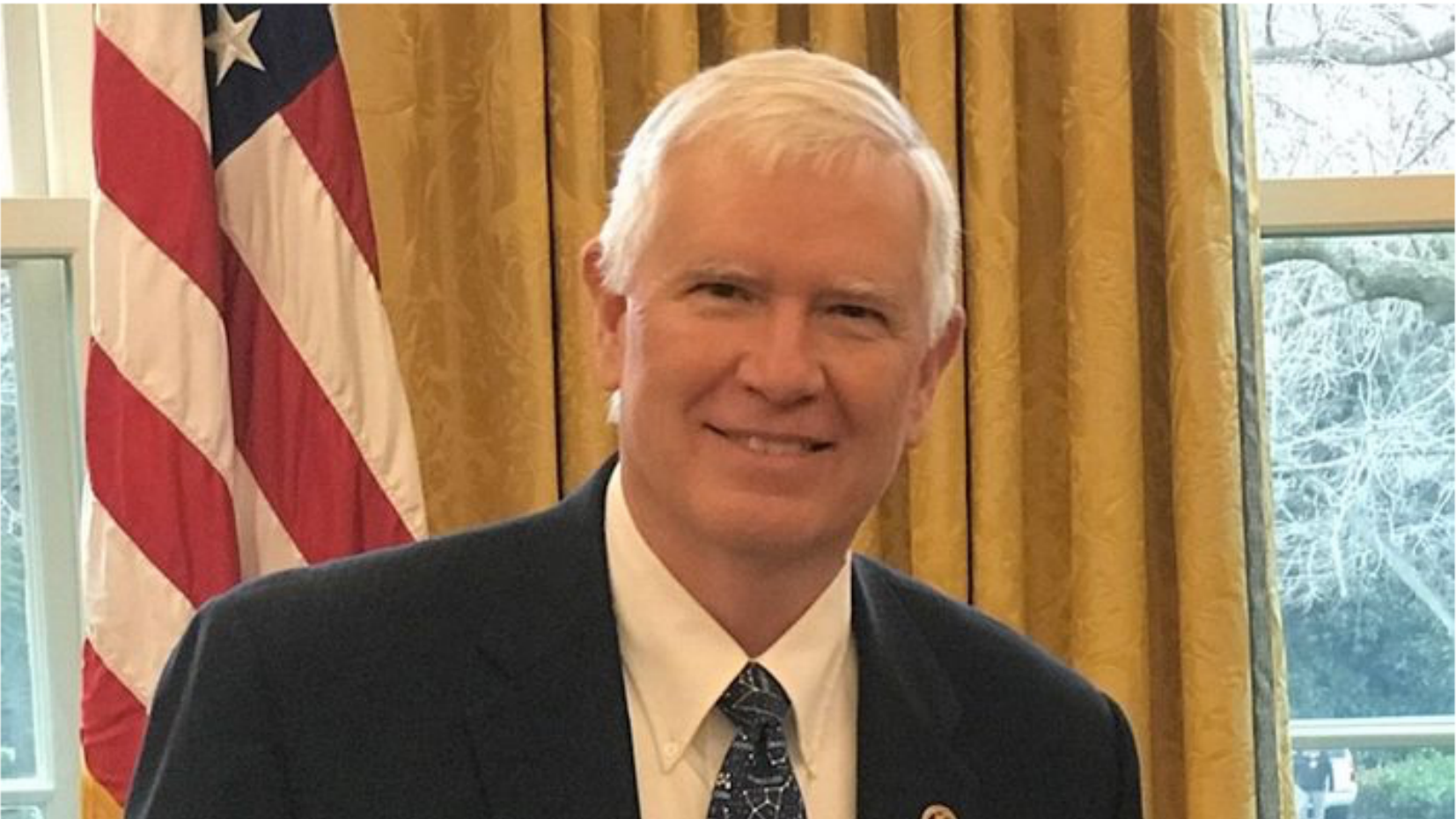
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Representative Mo Brooks (R-AL) WIKIMEDIA COMMONS

Republican lawmaker: Rocks tumbling into ocean causing sea level rise

By Scott Waldman, E&E News | May. 17, 2018, 9:10 AM

Rep. Dana Rohrabacher (R-CA) said he was bothered that established climate science has not been questioned more by the committee, which has accused federal climate scientists of fraudulently manipulating climate data and subpoenaed their records.

"I'm a little bit disturbed by, No. 1, over and over again, I hear, 'Don't ever talk about whether mankind is the main cause of the temperature changing and the climate changing,'" he said. "That's a little disturbing to hear constantly beaten into our heads in a Science Committee meeting, when basically we should all be open to different points of view."

Rep. Lamar Smith (R-TX), chairman of the committee, entered into the record an opinion piece published in *The Wall Street Journal* yesterday that claimed sea levels are not rising because of climate change, a view that rejects thousands of scientific studies. The piece was written by Fred Singer, who is affiliated with the Heartland Institute in Chicago, Illinois, which promotes the rejection of mainstream climate science.

"To solve climate change challenges, we first need to acknowledge the uncertainties that exist," Smith said in his opening remarks. "Then we can have confidence that innovations and technology will enable us to mitigate any adverse consequences of climate change."

At one point, Smith showed a slide of two charts that he said demonstrated how the rate of sea-level rise does not equal the sharp spike in the consumption of fossil fuels. When Smith pointed out that rates of sea-level rise have only increased slightly compared with the rate of fossil fuel use, Duffy pointed out that his chart was from a single tide gauge station, near San Francisco, and that sea levels rise at different rates around the world. Smith did not show rising atmospheric CO₂ levels or temperatures, both of which have climbed steadily in recent decades as emissions have increased.

“ Every time you have that soil or rock or whatever it is that is deposited into the seas, that forces the sea levels to rise, because now you have less space in those oceans, because the bottom is moving up. ”

Representative Mo Brooks (R-AL)

Intentional misleading

**Union of
Concerned Scientists**
Science for a healthy planet and safer world

SEARCH

[BLOG] UNION OF CONCERNED SCIENTISTS



Here's Why Seas Are Rising. Somebody Remind the Wall Street Journal.

SCOTT DENNING, [GUEST COMMENTARY](#), | MAY 18, 2018, 11:57 AM EDT

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Intentional misleading



Is the Human Race Too Dumb to Survive on This Planet?

A visit with the Republicans on the House Committee on Science, Space, and Technology.



BY CHARLES P. PIERCE MAY 17, 2018

1.8K
 





<https://www.esquire.com/news-politics/politics/a20735339/climate-change-republicans-house-science-committee/>

CO2 is Life

The Definitive Source for Exposing the Global Warming Hoax

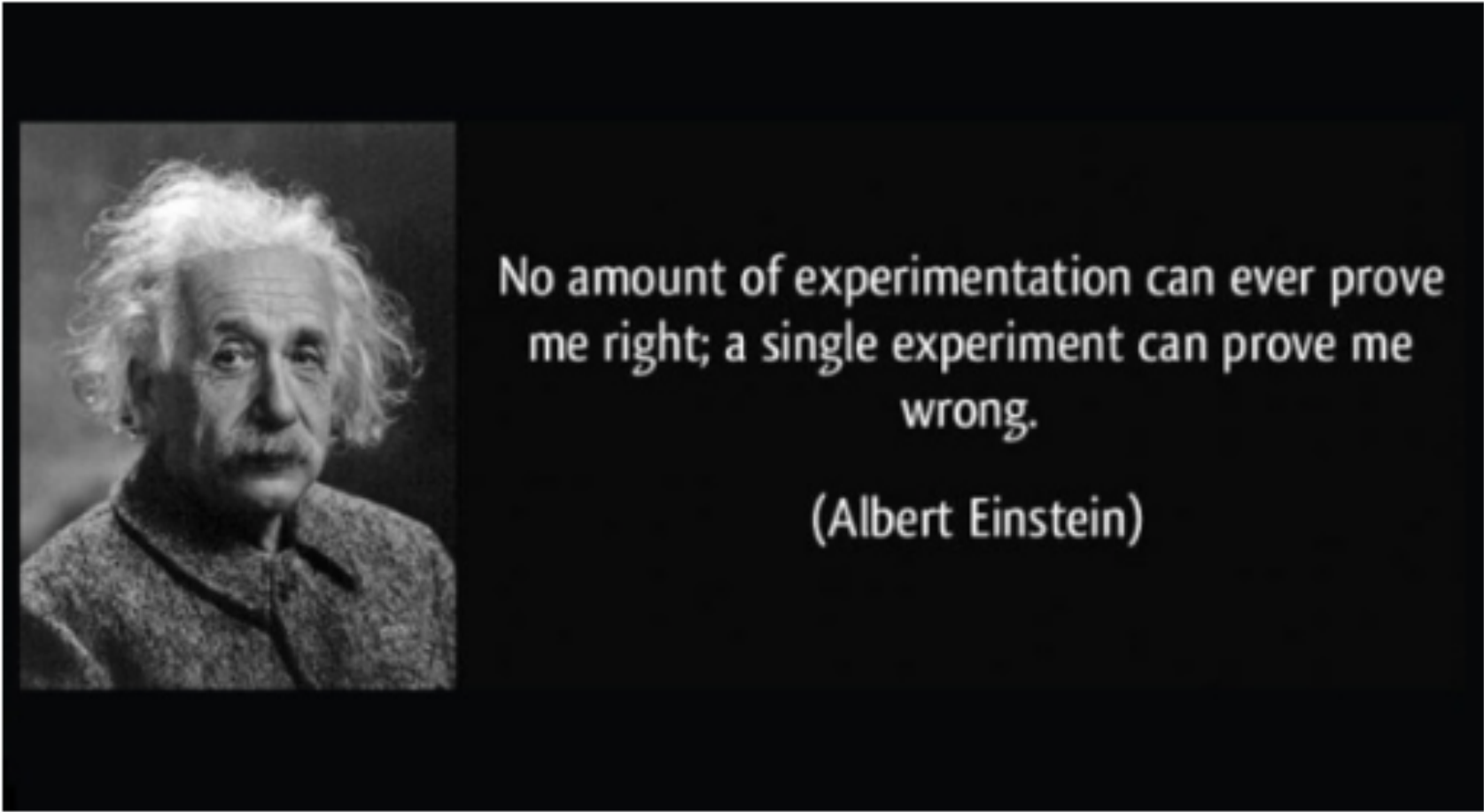
Climate Alarmists Don't Understand the Basics of the Scientific Method



co2islife

May 19, 2018

Climate Change, Climate Fraud, Climate Hoax, Climate Religion, Climategate, Discover, Environment, Global Warming, Junk Science, Politics, Science, Trump

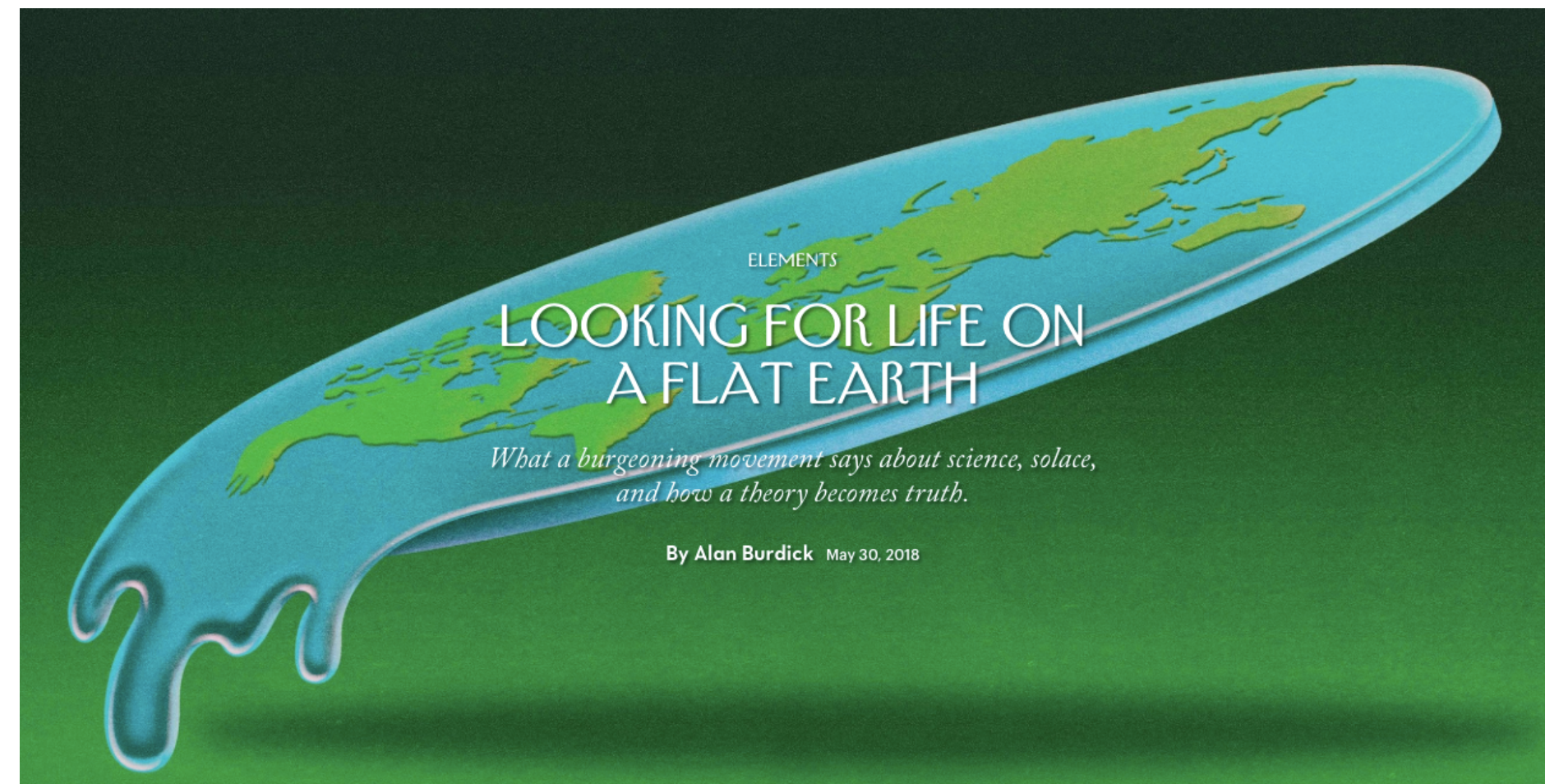


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<https://co2islife.wordpress.com/2018/05/19/climate-alarmists-dont-understand-the-basics-of-the-scientific-method/>

Evidence-Based Leadership

Group Constructs of Reality



A map from 1893 portrays Earth as square and stationary and warns of Biblical interdiction against the notion of a round Earth flying through space.

Illustration Courtesy Orlando Ferguson / L.H. Everts & Co. / Library of Congress

<https://www.newyorker.com/science/elements/looking-for-life-on-a-flat-earth>

The flat Earth is the post-truth landscape. As a group, its residents view themselves as staunch empiricists, their eyes wide open. The plane truth, they say, can be grasped in experiments that anyone can do at home. For instance, approach a large body of water and hold up a ruler to the horizon: it's flat all the way across. What pond, lake, or sea have you ever seen where the surface of its waters curves? Another argument holds that, if Earth were truly spherical, an airplane flying above it would need to constantly adjust its nose downward to avoid flying straight into space. If, say, you flew on a plane and put a spirit level—one of those levels that you buy at the hardware store, with a capsule of liquid and an air bubble in the middle—on your tray table, the level should reveal a slight downward inclination. But it doesn't: the level is level, the flight is level, the nose of the plane is level, and therefore the surface of Earth must be level. Marble performed this experiment himself, recorded it, posted it on YouTube, and a co-worker started a Reddit thread that linked to it. Soon Marble had twenty-two thousand followers and a nickname, the Spirit-Level Guy.

“We’re not trying to express any degree of intellectual superiority,” he said at the conference. “I’m just trying to wake people up to the idea that they’ve been lied to. It’s what you would do with any friend.”

Prioritizing of goals

Prioritizing of goals



BLUEPRINT FOR BUSINESS LEADERSHIP ON THE SDGS

Introduction

Business cannot thrive unless people and planet are thriving. This includes ensuring that the world is on a path to meet all 17 Sustainable Development Goals (SDGs). The 2030 Agenda for Sustainable Development (2030 Agenda), with 17 SDGs and 169 targets, is a plan of action for people, planet and prosperity. The SDGs are universal, transcend borders and apply across the workplace, marketplace and community. The SDGs are deeply interconnected – progress on one goal can have a significant impact on progress in meeting others. Business cannot thrive in a world of poverty, inequality, unrest and environmental stress, and so it has a vital interest in ensuring the 2030 Agenda is delivered.

Prioritizing of goals **Five Qualities of SDG Leadership**

INTENTIONAL	AMBITIOUS	CONSISTENT	COLLABORATIVE	ACCOUNTABLE
<p>Support for the SDGs is an integral, deliberate part of a leading company’s strategy</p> <p>A leading company’s actions in support of the SDGs are an integral, deliberate part of its strategy. Support for the SDGs is incorporated into the long-term business goals of the company. It is an integral element by which it strives for value creation; manages its workforce, supply-chain and other inputs; and addresses risks. This must be driven from the highest levels of the company and involve a strategic vision to open up new ways to contribute to the SDGs.</p>				

INTENTIONAL	AMBITIOUS	CONSISTENT	COLLABORATIVE	ACCOUNTABLE
<p>A leading company’s level of ambition greatly exceeds prevailing levels of ambition, its actions are material in the context of its end-to-end operations, and it focuses on long-term outcomes</p> <p>A leading company’s level of ambition greatly exceeds prevailing levels of ambition, is aligned with global targets where relevant, and inspires action by others. Leading action represents a step forward in contributing to the SDGs within an industry and across geographies. Targets are set based on science or accepted thresholds, implying a level of ambition that meets or surpasses what is required for realizing the SDGs. A leading company inspires peers to emulate its actions, including through audacity in challenging existing business practice and what is perceived to be possible. In doing so, the leading company has the potential to transform the way in which business is done beyond the boundaries of its own organization.</p> <p>Ambition requires that action is material in the context of the company’s end-to-end operations. Small and medium-sized enterprises can be as ambitious as multinationals, despite each type of firm having different levels of absolute impact (negative and positive). In all cases, a leader looks beyond its own operations to its value chain, from suppliers to consumers, as well as to a wider group of stakeholders, to assess on which SDGs it has a material impact. Materiality in this sense extends beyond financial impact on the company itself to encompass all types of impact on people, planet and prosperity that the company may have.</p> <p>Finally, ambition means a focus on action that will deliver long-term outcomes. A leading company does not focus primarily on inputs and outputs, but explicitly targets long-term progress while also ensuring shorter-term contributions to the SDGs.</p>				

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<div> <div>Support for the SDGs is embedded across organizational functions and external communications</div> <div> A leading company embeds support for the SDGs across organizational functions, making its actions and communication consistent. The focus on the SDGs is recognized across the business, including by all senior leaders. Top-level ethical behavior and commitment are embedded throughout the organization and underpin the performance required to advance the SDGs. It is particularly important that there is consistency between what the company says and what it does throughout its business, from advertising and marketing to corporate strategy and government affairs. </div> <div> A leading company aligns its public voice and advocacy with its ambitions, strategies, and actions to support the SDGs. This requires internal and external transparency in line with the accountability quality. A leading company is consistent in the intention of its actions and approaches across geographies and over time, adapting them to contextual differences as appropriate. </div> </div>				

INTENTIONAL	AMBITIOUS	CONSISTENT	COLLABORATIVE	ACCOUNTABLE
<div> <div>Support for the SDGs involves partnerships, including with business, government, civil society and other actors</div> <div> A leading company's action on the SDGs includes proactive collaboration with others. Collaboration complements the leading company's own capabilities so as to achieve the best possible outcomes for the SDGs. The company forges partnerships with other businesses, government, civil society organizations, academia, investors, and local communities. These partnerships are facilitated by the leading company publicly advocating SDG action. </div> <div> Collaboration follows established guidelines and principles of engagement in the relevant areas. Partnerships should be co-owned and involve shared decision making. The legitimacy of the leading company's use of its power in the context of its partnerships, especially in relation to government priorities in developing countries, must be guaranteed. In doing so, leading companies support SDG 16 by promoting effective, accountable and inclusive institutions. </div> </div>				

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<p>A leading company is transparent, manages risk, seeks out meaningful engagement with stakeholders, and is accountable for adverse impacts.</p> <p>A leading company understands and acts upon its responsibility to people and planet by holding itself fully accountable for the actions it takes and the impacts it has. It has systems to identify the impacts it causes, contributes and is linked to; risk management processes to prevent adverse impacts; and procedures to allow access to remedy, including through grievance mechanisms, for any remaining impacts that result from its actions or decisions.</p> <p>Accountable leadership means being transparent and engaging stakeholders proactively on challenges and progress towards the SDGs. This fosters trust from government, investors, employees, customers and communities. A leading company knows and shows how it is improving its performance, allowing these stakeholders to make informed decisions. A leading company is not only transparent, but also actively seeks out the views of stakeholders and acts on them.</p> <p>To be accountable, a leading company must act lawfully and align its actions with established international norms, including in cases where domestic law falls short. For example, it should continue to respect international standards even if these are not legally mandated in the country where it operates [see Box 1].</p>				

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ENVIRONMENT

The U.N. Goal That Doesn't Get A Lot Of Respect

May 31, 2018 · 11:55 AM ET

TIM MCDONNELL



<https://www.npr.org/sections/goatsandsoda/2018/05/31/614493772/the-u-n-goal-that-doesnt-get-a-lot-of-respect>

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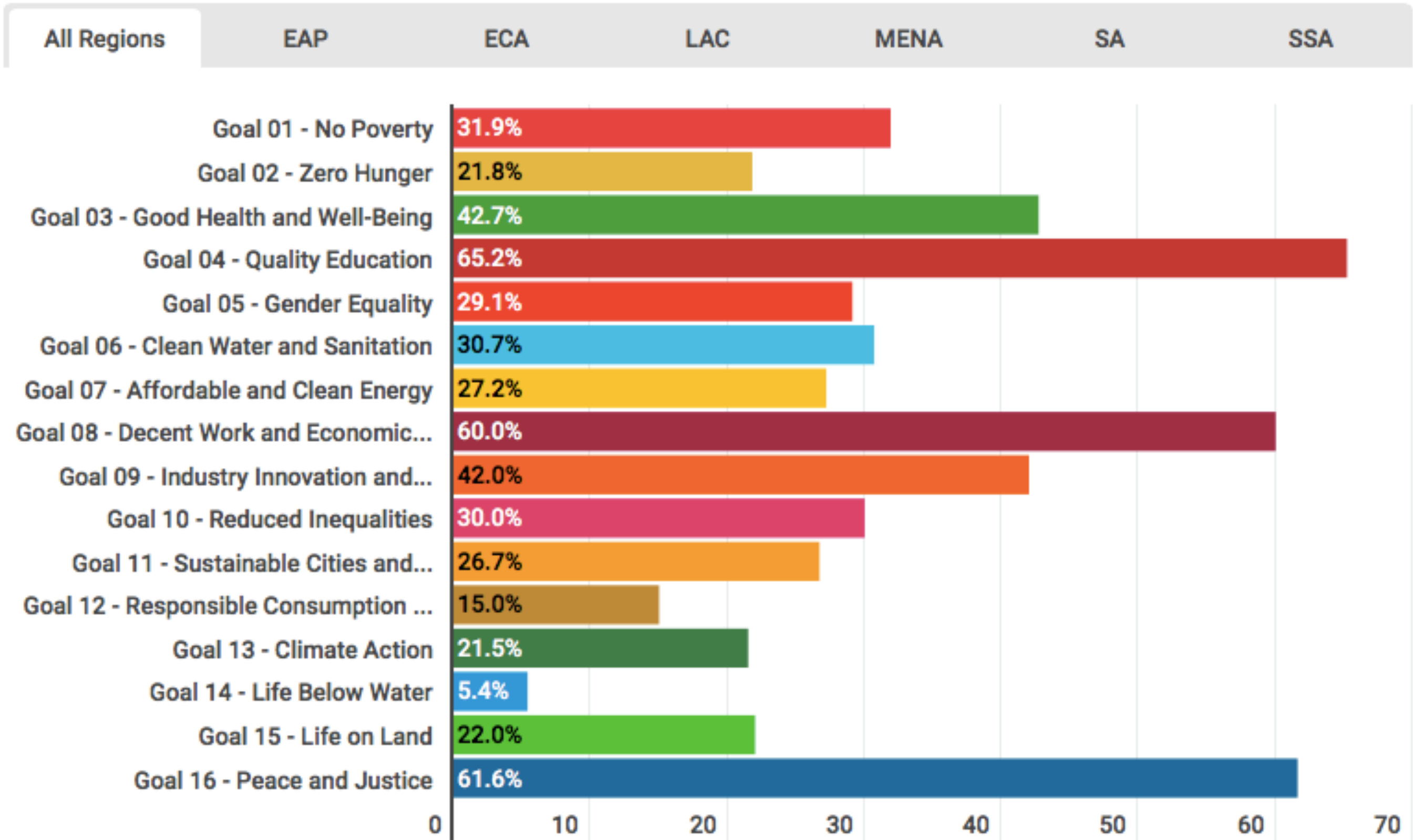
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TIM MCDONNELL



How frequently does a global goal appear in leaders top six priorities?



Source: *Listening to Leaders 2018: Is development cooperation tuned-in or tone-deaf?*

Acronyms:

EAP: East Asia & Pacific
 ECA: Europe & Central Asia
 LAC: Latin America & Caribbean
 MENA: Middle East & North Africa
 SA: South Asia
 SSA: Sub-Saharan Africa

<https://www.npr.org/sections/goatsandsoda/2018/05/31/614493772/the-u-n-goal-that-doesnt-get-a-lot-of-respect>

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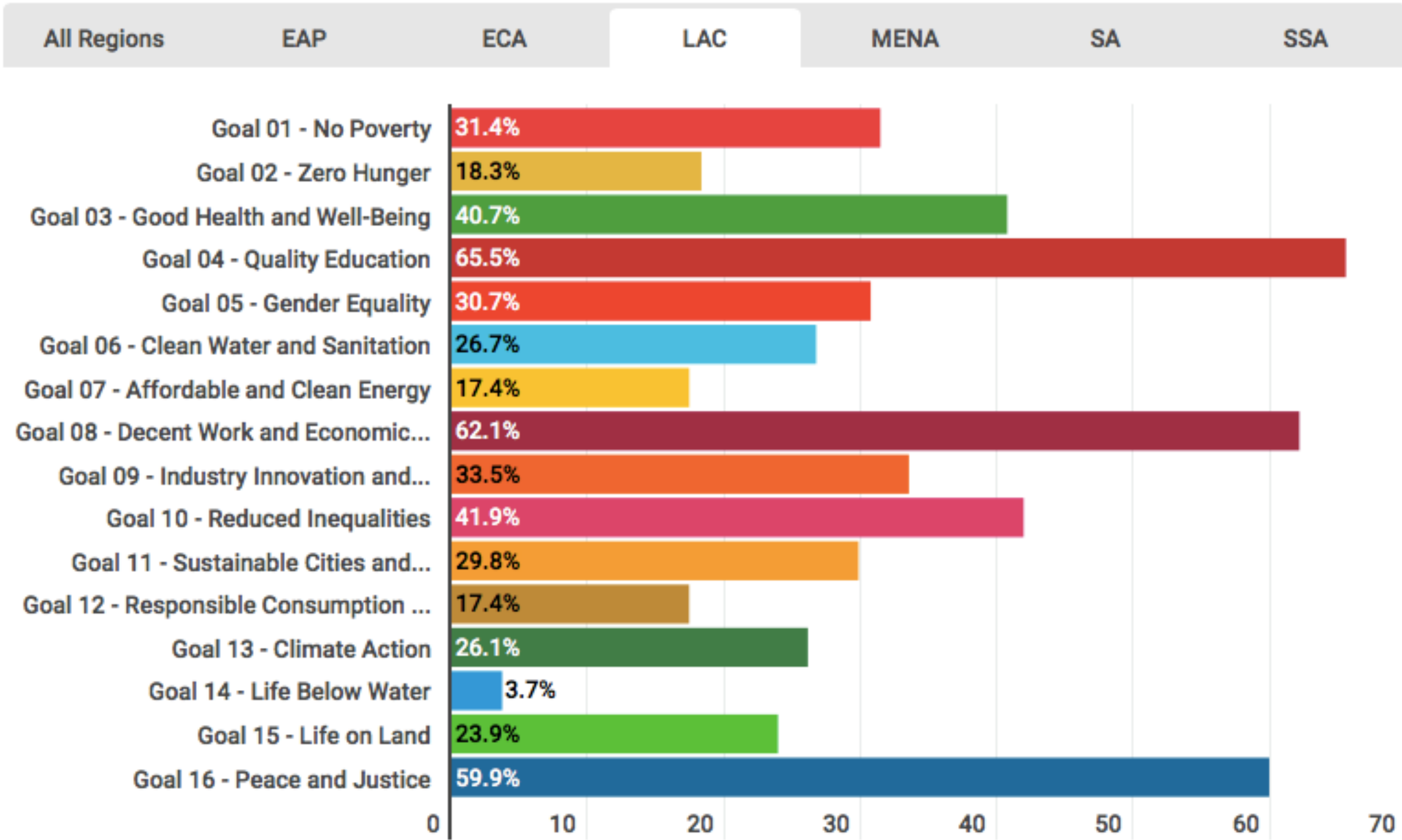
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David Attenborough: The world's oceans are under the greatest threat in human history



BBC's latest Attenborough series, Blue Planet, highlights how we are damaging our oceans and it's corals

Image: REUTERS/David Gray

Attenborough **says**: “For years we thought the oceans were so vast and the inhabitants so infinitely numerous that nothing we could do could have an effect upon them. But now we know that was wrong.

“It is now clear our actions are having a significant impact on the world’s oceans. [They] are under threat now as never before in human history. Many people believe the oceans have reached a crisis point.”

<https://www.weforum.org/agenda/2017/12/the-world-s-oceans-are-under-the-greatest-threat-in-human-history-says-sir-david-attenborough>

Whale that died off Thailand had eaten 80 plastic bags

🕒 2 June 2018

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A pilot whale has died off southern Thailand after swallowing 80 plastic bags, Thai marine officials say. <http://www.bbc.com/news/world-asia-44344468>

More plastic than fish

Another major threat to the oceans is the sheer amount of plastic waste clogging up our seas.

Previous research by the World Economic Forum and Ellen MacArthur Foundation estimates that by 2050 there could be **more plastic than fish in the sea**.

<https://www.weforum.org/agenda/2017/12/the-world-s-oceans-are-under-the-greatest-threat-in-human-history-says-sir-david-attenborough>

Prioritizing of goals

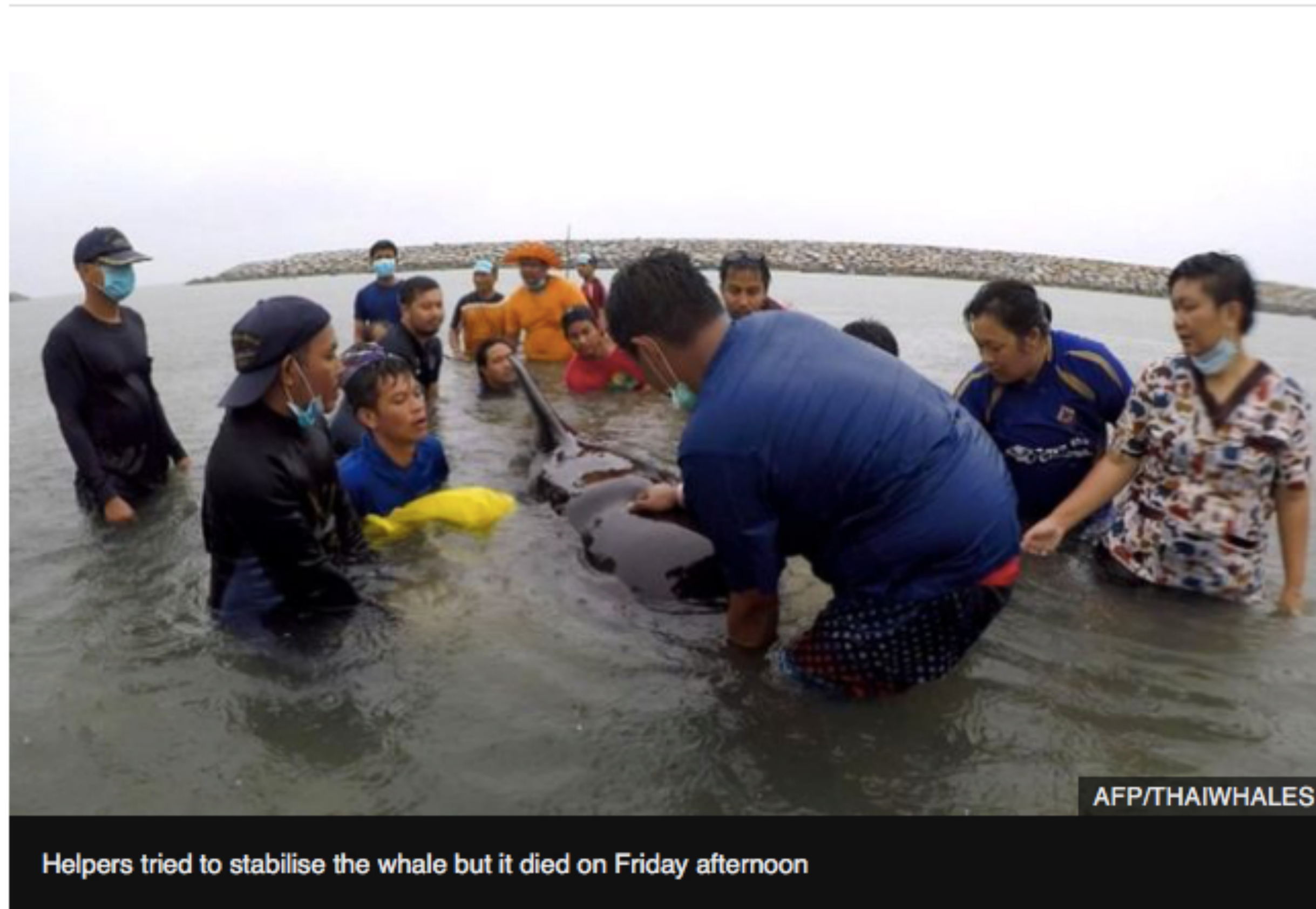
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Acknowledging threats

Acknowledging threats

Europe plans ban on plastic cutlery, straws and more

by [Alanna Petroff](#) @AlannaPetroff

🕒 May 28, 2018: 11:00 AM ET

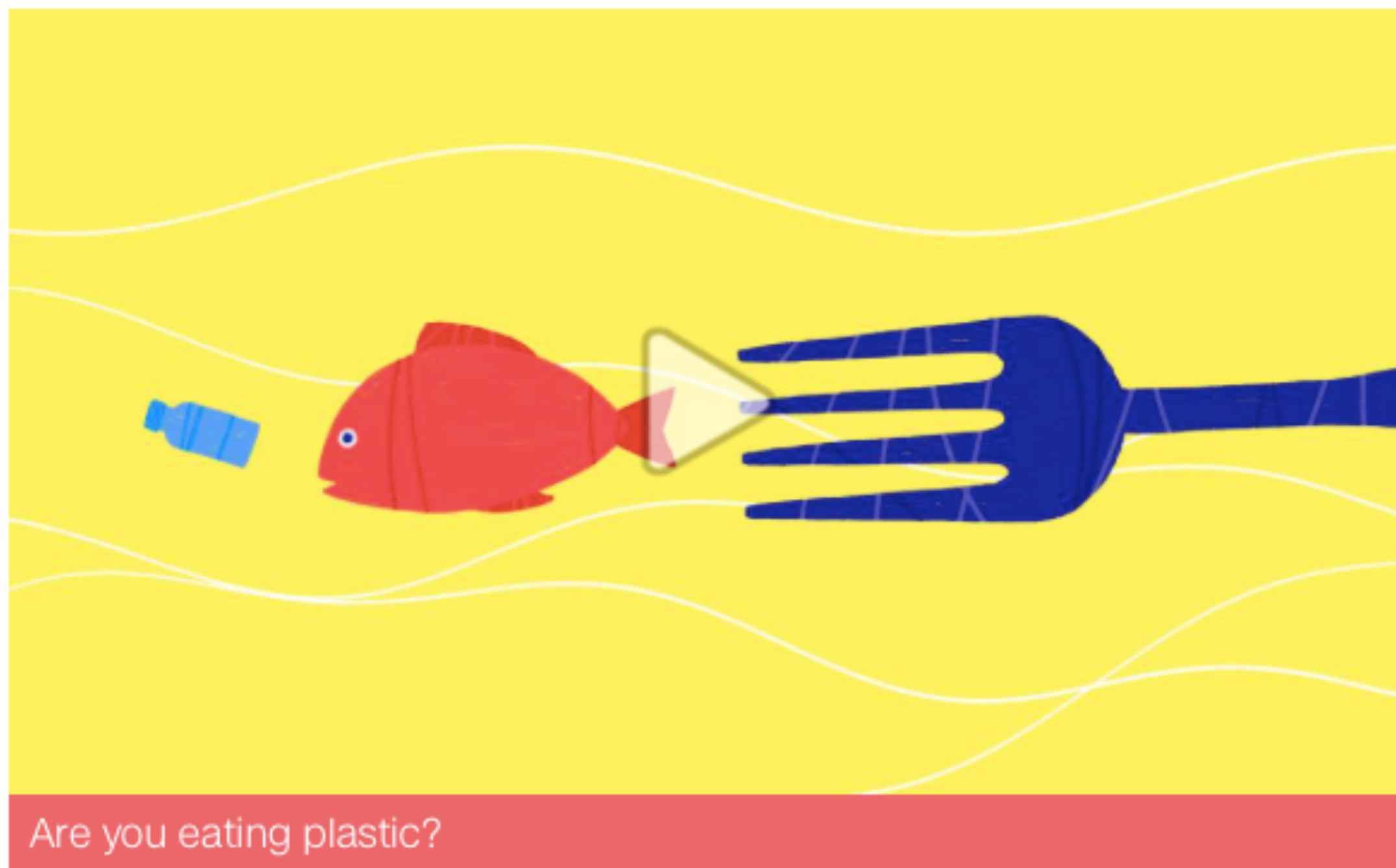


The draft rules were unveiled Monday but need the approval of all EU member states and the European Parliament. It could take three or four years for the rules to come into force.

The legislation is not just about banning plastic products. It also wants to make plastic producers bear the cost of waste management and cleanup efforts, and it proposes that EU states must collect 90% of single-use plastic bottles by 2025 through new recycling programs.

The European Commission estimates that these rules, once fully implemented in 2030, could cost businesses over €3 billion (\$3.5 billion) per year. But they could also save consumers about €6.5 billion (\$7.6 billion) per year, create 30,000 jobs, and avoid €22 billion (\$25.6 billion) in environmental damage and cleanup costs.

Related: China trash ban is a global recycling wake up call



Europe is proposing a ban on single-use plastic items such as cutlery, [straws](#) and cotton buds in a bid to clean up the oceans.

The European Commission wants to ban 10 items that make up 70% of all litter in EU waters and on beaches. The list also includes plastic plates and drink stirrers.

<http://money.cnn.com/2018/05/28/news/europe-plastic-ban-proposal/index.html>

Ignoring threats

Ignoring threats

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WHY WE MAY STARVE WITHOUT BEES AND BUTTERFLIES

Why we may starve without bees and butterflies

TNN | Updated: Jun 1, 2018, 10.35 AM IST

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A+

Bees and butterflies play a vital role in the pollination of plants and the production of crops. However, they along with other pollinators like birds and bats are threatened with extinction. Their decline could cause some major global food production problems. The loss could be as high as 15-25% for some nations. Here's more:

OF BEES, BUTTERFLIES AND FOOD SUPPLY

75%

of the world's food crops depend in part on pollination by these and other species

Expected crop loss if pollinators become extinct (%)

0 - 2.5

2.5 - 5

5 - 7.5

7.5 - 10

10 - 12.5

12.5 - 15

15 - 25

POLLINATORS:

bees, butterflies, other insects; birds, bats, other vertebrates

THREATS:

pesticides (inc. neonicotinoid insecticides), intensive farming, pests, diseases, climate change

POLLINATORS FACING EXTINCTION:

+40%

of bees, butterflies, other invertebrates

+16.5%

of birds, bats, other vertebrates

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<https://timesofindia.indiatimes.com/world/why-we-may-starve-without-bees-and-butterflies/articleshow/64410387.cms>


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A young resident jumps off a piling at the gas dock in Tangier, Virginia on May 17, 2017.

IMAGE: AP/REX/SHUTTERSTOCK

Sea level rise caused by global warming is threatening the existence of the tiny community of

There's one particular part of the video that we should all take a look at because it both reinforces every stereotype liberals have about their ideological opponents while suggesting a path forward.

That is a mistake that a lot of environmentalists make, when talking to Republicans and conservatives about solar, about clean energy. **They lead off with climate change!**

That is the wrong message.

If you deliver the message of energy freedom, energy choice, competition, national security, innovation, all of a sudden, you will have a receptive audience and they will listen to you.

If you lead off with climate change, they're not going to pay a bit of attention to anything else you say. They've been brainwashed for decades into believing, *oh, we're not damaging the environment...*

Lack of integrity

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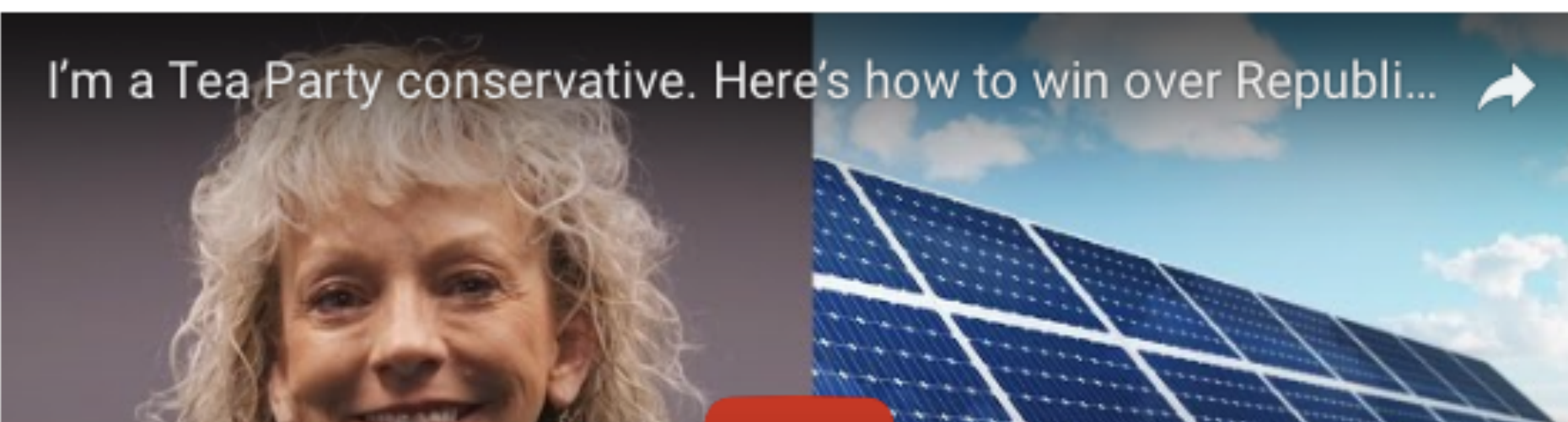
Evidence-Based Leadership

Lack of integrity

Tea Party Co-Founder: Want to Win Over the GOP on Renewable Energy? Never Mention “Climate Change”

April 18, 2017 by Hemant Mehta 202 Comments

Vox [published a video](#) today featuring Tea Party co-founder and conservative activist **Debbie Dooley** making the case for how liberals can “win over Republicans on renewable energy.” (She’s clearly passionate about that subject even though it puts her at odds with many others in her party.)



But what does it say about conservatives that the mere mention of “climate change” causes them to tune out? What does it say about a political party when pointing out established science discredits you in their eyes?

Dooley is essentially saying, *Don't be honest with conservatives about science. They can't handle it.* But if we can't be honest with them, what's going to stop them from pursuing another conspiracy theory in the future? Are Republicans really so weak that attaching “freedom” to an idea is the only way for them to take it seriously? We shouldn't have to change the nature of the debate because one side refuses to acknowledge reality.

So, sure, if we want Republicans to start supporting environmental causes, we need to step inside their bubble and use phrasing that gets through to them.

Or, better yet, we can stop electing Republicans like that and vote for people who aren't afraid of facts.

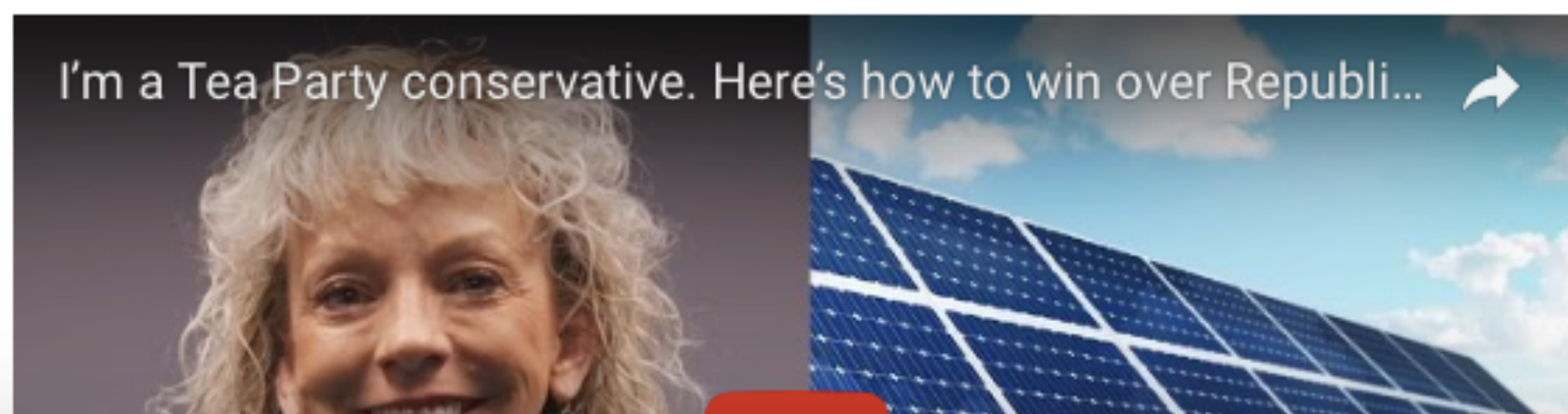
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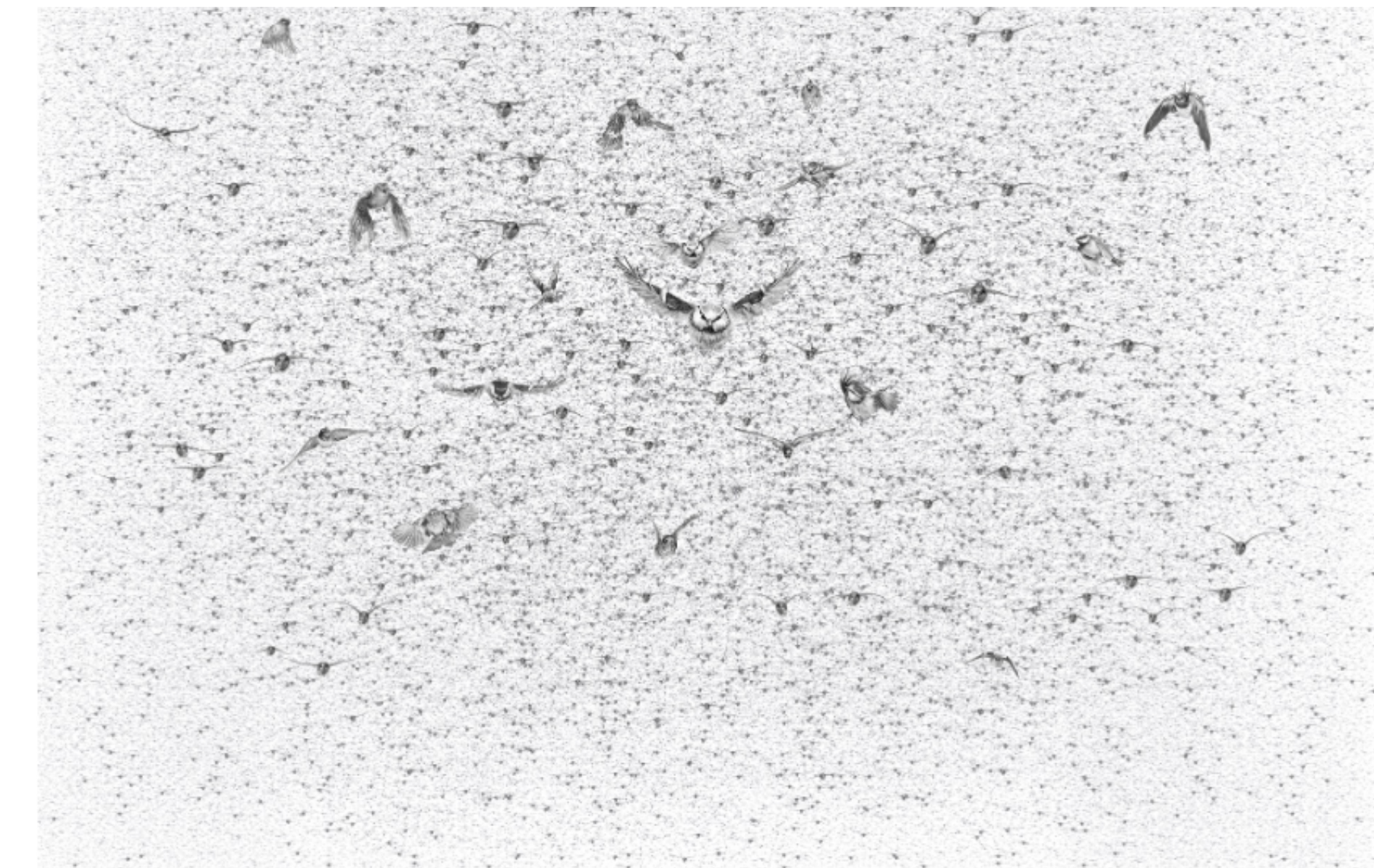
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Being an evidence-based leader in times of climate change, increasing pollution, extinction, environmental injustice, ...

Evidence-Based Leadership

Being an evidence-based leader in times of climate change, increasing pollution, extinction, environmental injustice, ...



Silent Spring, 2014 44x58" and 60x80"; Chris Jordan and Rebecca Clark; made from 28 graphite drawings by Rebecca Clark
Depicts 183,000 birds, equal to the estimated number of birds that die in the United States every day from exposure to agricultural pesticides.

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Midway: Message from the Gyre
(2009 - Current)



Midway: Message from the Gyre
(2009 - Current)





WRITERS ON THE RANGE

Addressing climate grief makes you a badass, not a snowflake

Students studying the emotional toll of environmental loss faced a wave of vitriol.

Jennifer Atkinson | OPINION | May 29, 2018 |



Note: the opinions expressed in this column are those of the writer and do not necessarily reflect those of High Country News, its board or staff. If you'd like to share an opinion piece of your own, please write Betsy Marston at betsym@hcn.org.



Jennifer Atkinson is a contributor to Writers on the Range, the opinion service of High Country News. She is a senior lecturer at the University of Washington, Bothell, where she teaches courses on environmental humanities and American literature. She is also the author of

[Gardenland: Nature, Fantasy, and Everyday Practice](#).

I've watched students at the University of Washington struggle with the depressing realities of our ecological crisis for nearly 10 years. That's why I decided to offer a new seminar on "Environmental Grief and Climate Anxiety." When registration opened, every seat filled. But after the local media began [reporting on the class](#), a flood of derisive emails and phone calls poured into my office, and the newspaper comment sections filled up with responses mocking today's "absurd" college courses and the students who attend them.

Environmental Grief and Anxiety

Here's just one reaction: "Do the students roll out nap mats and curl up in the fetal position with their blankies and pacifiers while listening to her lectures?"

Given our polarized political climate and the way it's infected environmental issues, perhaps the hostility directed at me wasn't that surprising. But I was amazed at the derision heaped on today's students. They were mocked as "wimpy" and "coddled" babies, told to "grow up," and caricatured over and over as "snowflakes."

The irony of such charges runs deep. Facing the hard truths of our climate crisis takes steady courage and a certain amount of grit. Today's students are reaching maturity at a moment when the scale of environmental disruption boggles the mind: increasing wildfires, rising seas and collapsing glaciers, vanishing forests and displaced communities. And remember that much worse is on the way.

Denial — carefully looking the other way — is a normal response to challenges this overwhelming. But unlike many of us, the young people I've met who are preparing for environmental careers are choosing not to look away. They know that the work ahead will require them to confront even more suffering and loss, and they are right to seek ways to channel their distress into action. Emerging efforts by colleges and community groups to **provide tools** for managing that distress can hardly be dismissed as the equivalent of a group hug.

My class is more like boot camp, preparing students for the long, hard fight ahead.

<https://www.hcn.org/articles/opinion-addressing-climate-grief-makes-you-a-badass-not-a-snowflake>

Environmental Grief and Anxiety

Many of us are familiar with the stages of mourning following the loss of human life — denial, guilt, anger, depression and, ultimately, acceptance — but we don't really have a vocabulary for the loss of our natural world. Only recently have climate activists and mental health professionals started using terms like [climate depression](#), [eco-grief](#) and [pre-traumatic stress](#). This is the distress that can occur when your daily work is to talk about and plan for an increasingly ominous future.

Left out of all the snide and hostile remarks directed at me and my students was the image featured in the Seattle Times story on this class. It showed a dead albatross, its open belly overflowing with plastic trash. The photo was from a series by photographer Chris Jordan, who spent years documenting the mass die-off of these magnificent birds. Some he held in his hands as they gasped their final breath after ingesting Pacific Ocean plastic. Jordan's work exposing the consequences of our consumer culture required him to look suffering and death in the face. It's not work for the faint of heart, and Jordan has [spoken publicly](#) about the emotional toll of his work.



Photographer Chris Jordan dealt with feelings of depression and grief while documenting the lethal effects of plastic debris on Midway Atoll.

Chris Jordan / USFWS

Direct engagement with today's biggest challenges is, nevertheless, the path many of today's students are choosing to follow. That doesn't make them snowflakes. It makes them badassess.

<https://www.hcn.org/articles/opinion-addressing-climate-grief-makes-you-a-badass-not-a-snowflake>

Questions for you:

- 1 Jack London explores the conflict between man and nature in “[To Build a Fire](#).” Could the ending of the story be different? Briefly explain why or why not?
- 2 [Capra \(1996\)](#) states in Chapter 1, “*The more we study the major problems of our time, the more we come to realize that they cannot be understood in isolation. They are systemic problems, which means that they are interconnected and interdependent.*” Discuss your interpretation of the statement while giving examples from the text. Can you apply Capra's point to a problem you are familiar with?
- 3 [Kirchhoff et al. \(2013\)](#) mention “*...new approaches to the creation of knowledge involving both growing integration across disciplines and greater interaction with users*” as part of their study. Briefly elaborate on that thought.
- 4 Evidence-based decision and policy making can easily lead to decision and policy-based evidence making. Explain the difference.
- 5 What is the difference between aiming to predict the future and developing foresight? Use examples to illustrate the difference.
- 6 What is the main thought in [Seligman and Tierney \(2017\)](#) and how does this related to sustainability leadership?
- 7 Use Carpenter et al. (2005) to discuss the link between scenarios and foresight.



Contents:

- 1 Introduction
- 2 Hazards
- 3 Vulnerabilities
- 4 Foresight
- 5 Decision-Making & Stakeholders
- 6 Options
- 7 Discussion, Summary, Recommendations