

LIVING AT THE INTERSECTION OF CLIMATE SCIENCE AND ACTION



DEMOCRACY DIES IN DARKNESS



Senior Scientist – Carbon180

Climate change scientist – University of Wyoming

500 Women Scientists co-founder

Filmmaker

Daughter, sister, partner, dog mom, friend, skier, climber, biker, Netflix-binger



CLIMATE

A New Kind of Climate Leadership

Climate change is an opportunity to envision a new world—but in whose image?

By Jane Zelikova, Giana Amador on September 23, 2019

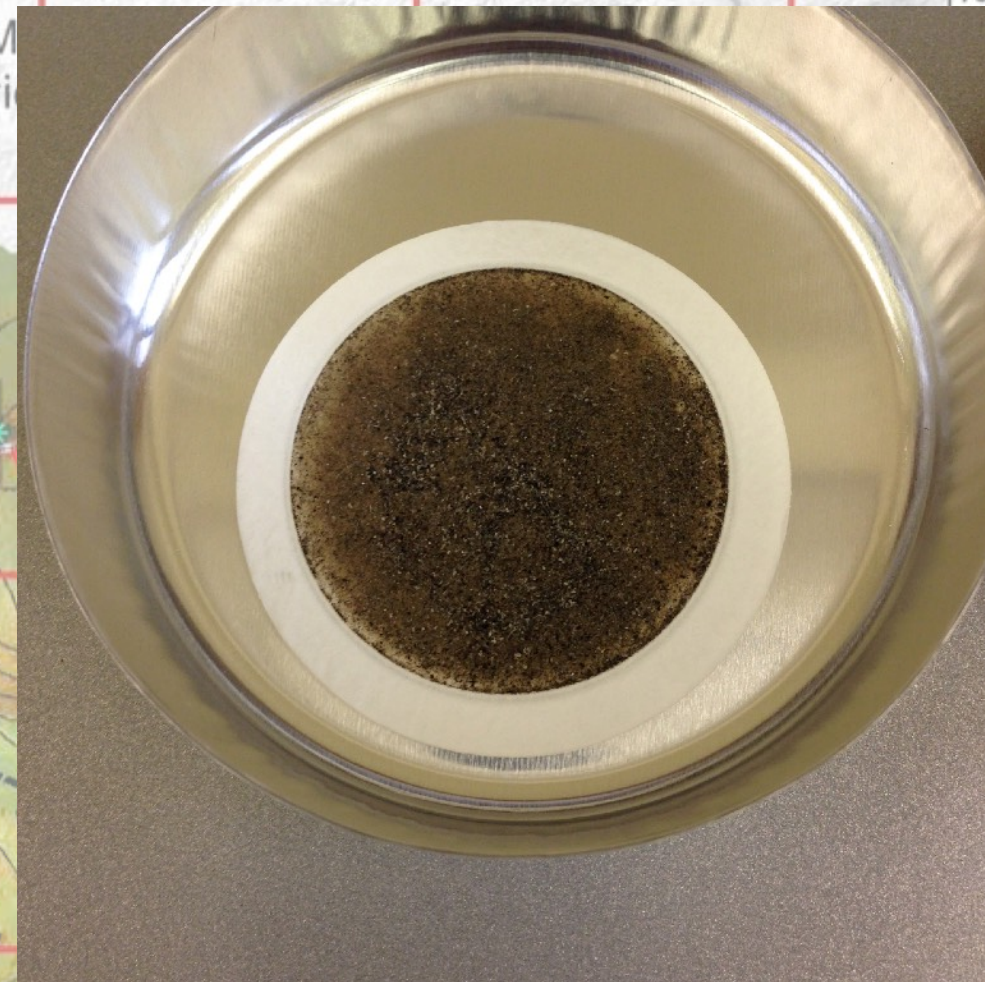
SCIENTIFIC
AMERICAN®

<https://www.scientificamerican.com/article/a-new-kind-of-climate-leadership/>

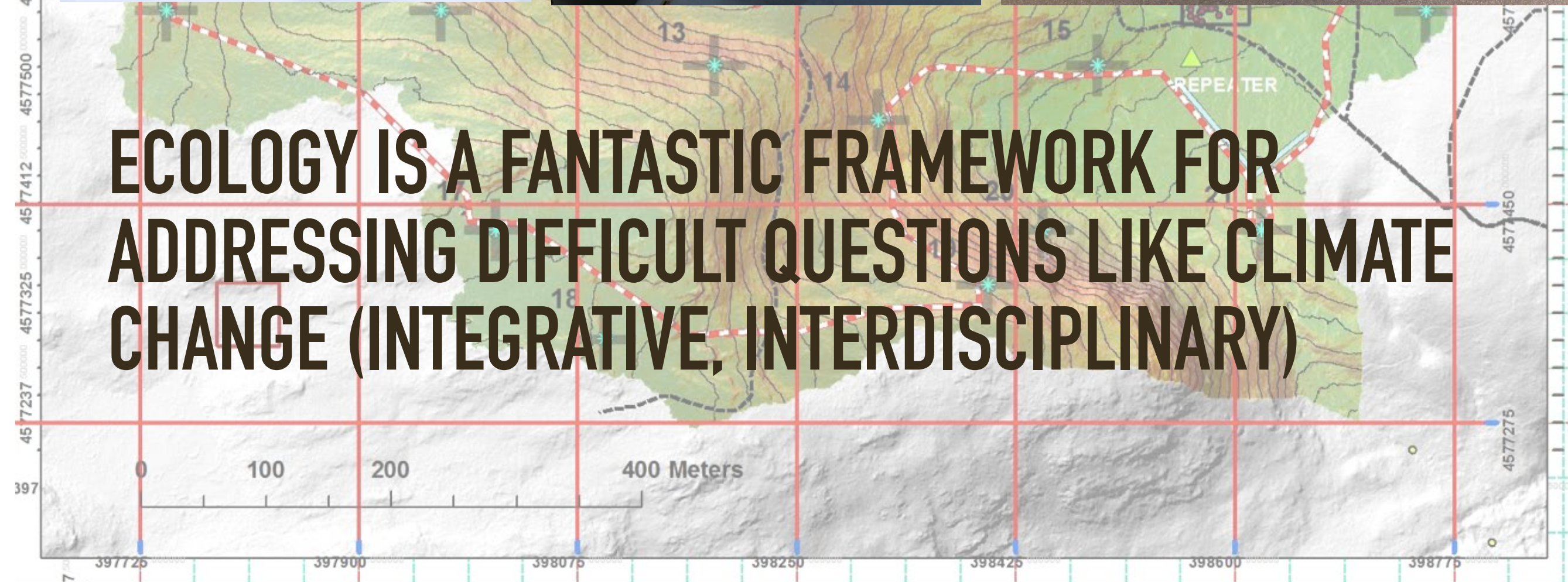
A PHD IN ECOLOGY

SCIENCE





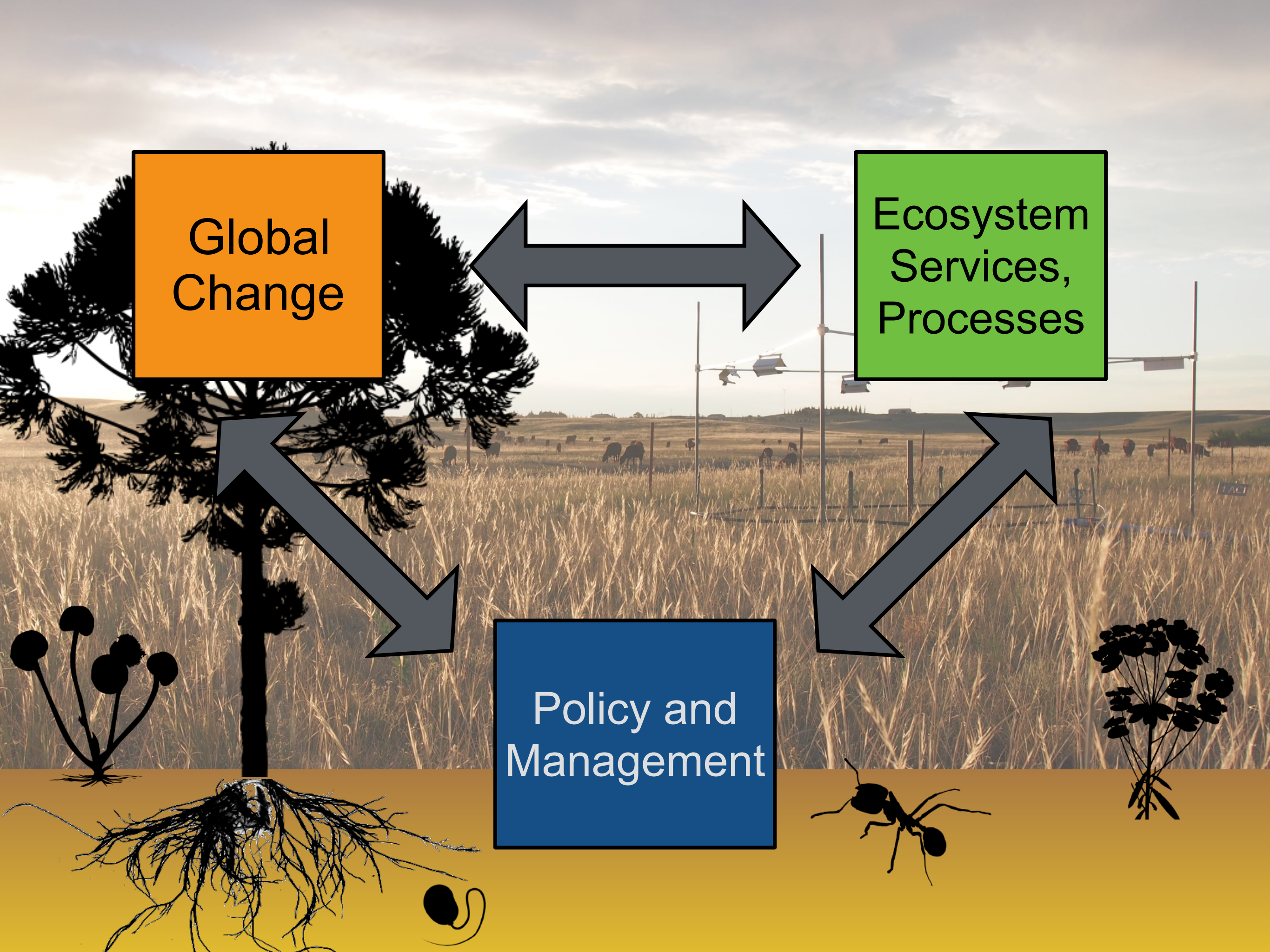
ECOLOGY IS A FANTASTIC FRAMEWORK FOR ADDRESSING DIFFICULT QUESTIONS LIKE CLIMATE CHANGE (INTEGRATIVE, INTERDISCIPLINARY)



Global
Change

Ecosystem
Services,
Processes

Policy and
Management



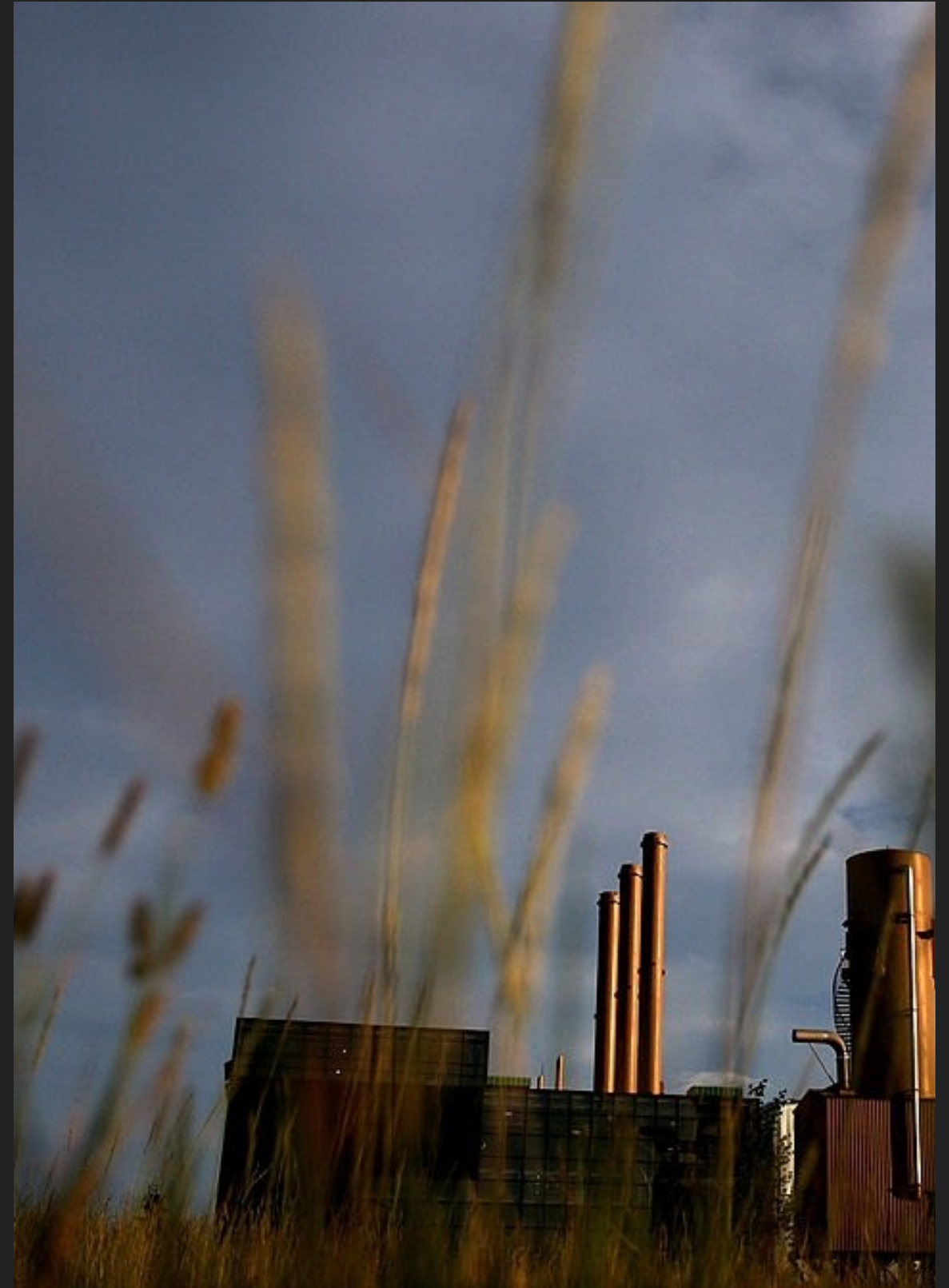
A LOT OF CLIMATE CHANGE SCIENCE BUT....

SCIENCE

- ▶ How do we put this knowledge to work?
- ▶ How do we ensure solutions do not perpetuate the same systems that helped create the problem and benefit from it?



- ▶ AAAS Science and Technology Policy Fellowship
 - ▶ Department of Energy Office of Fossil Energy
 - ▶ Decarbonization of the fossil fuel-based sectors
 - ▶ Policy = translating science + building relationships + economics



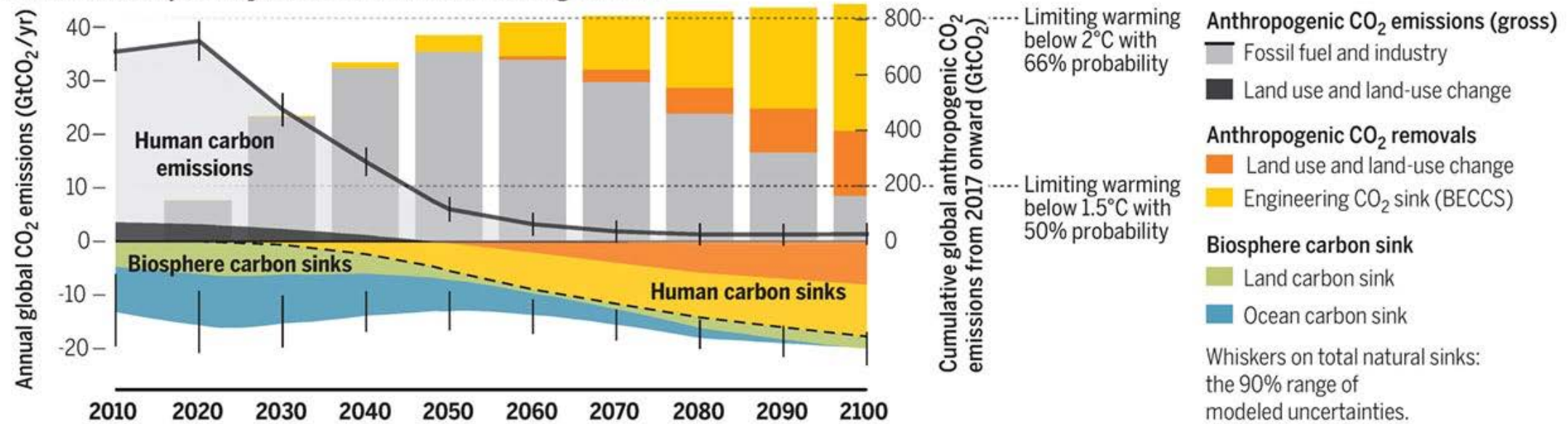


THE CARBON CHALLENGE

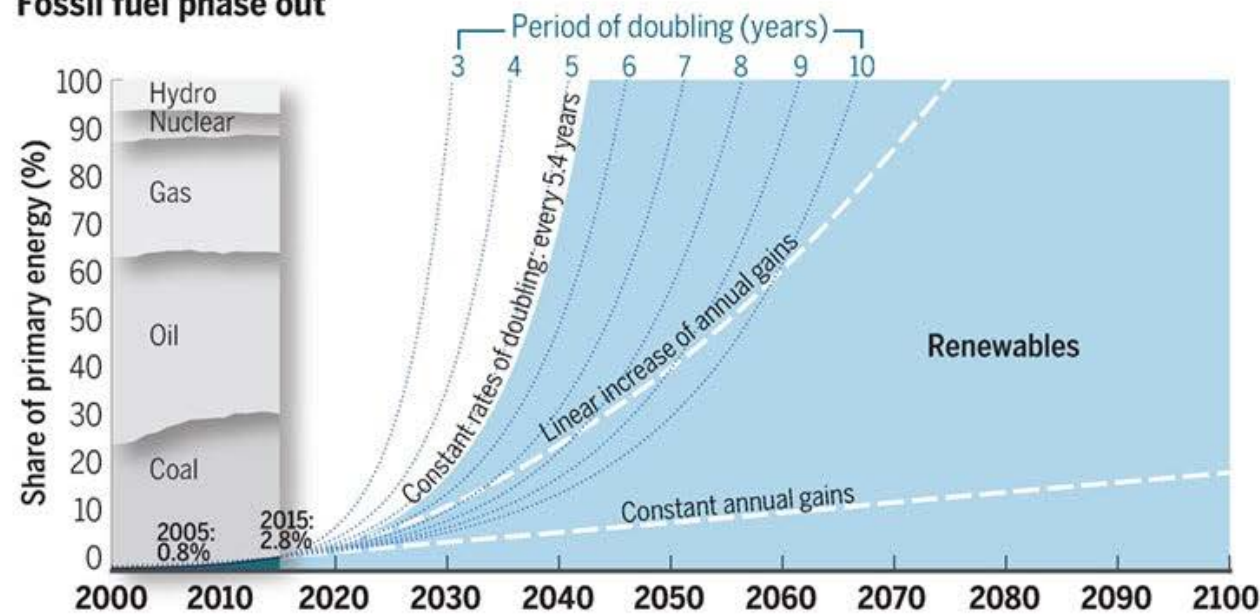
THE ROADMAP TO DECARBONIZATION

A global carbon law and roadmap to make Paris goals a reality

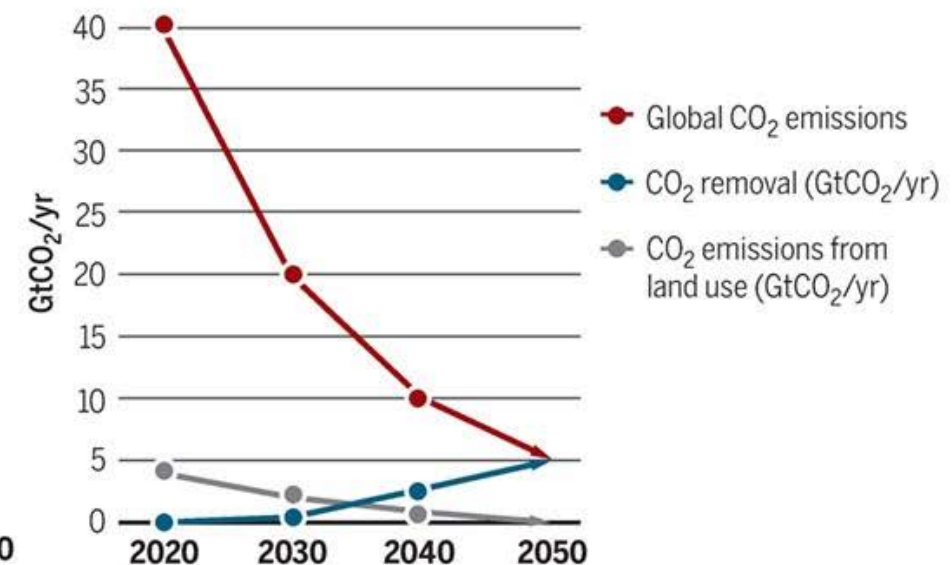
Decarbonization pathway consistent with the Paris agreement



Fossil fuel phase out



Global carbon law guiding decadal pathways



Rockstrom et al March 2017 Science

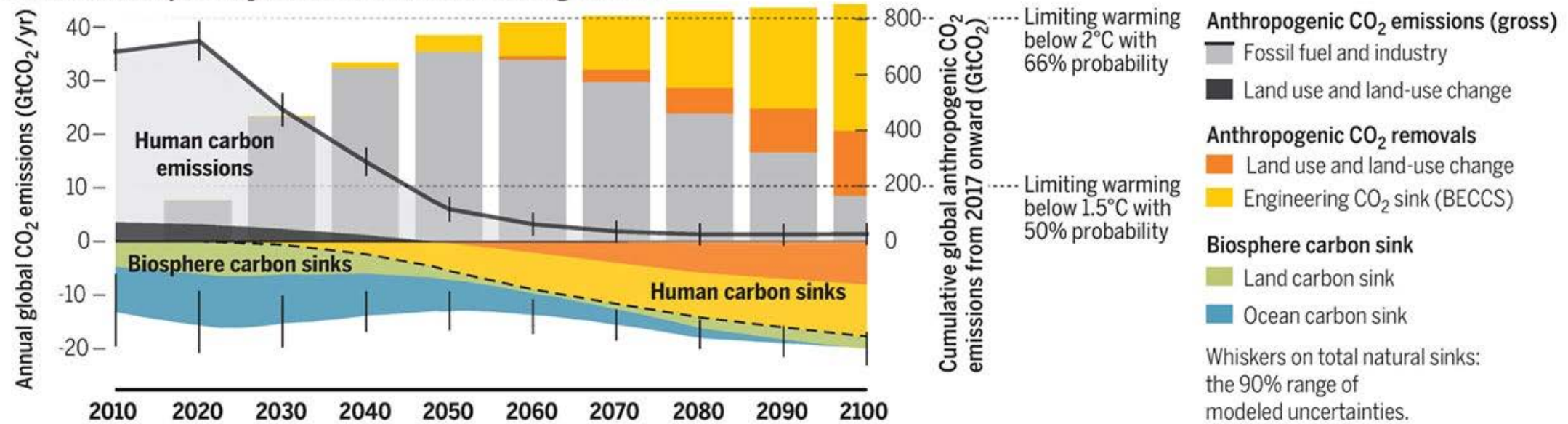
The carbon law – halving gross CO₂ emissions every decade

Need scalable carbon removal and efforts to ramp down land-use CO₂ emissions

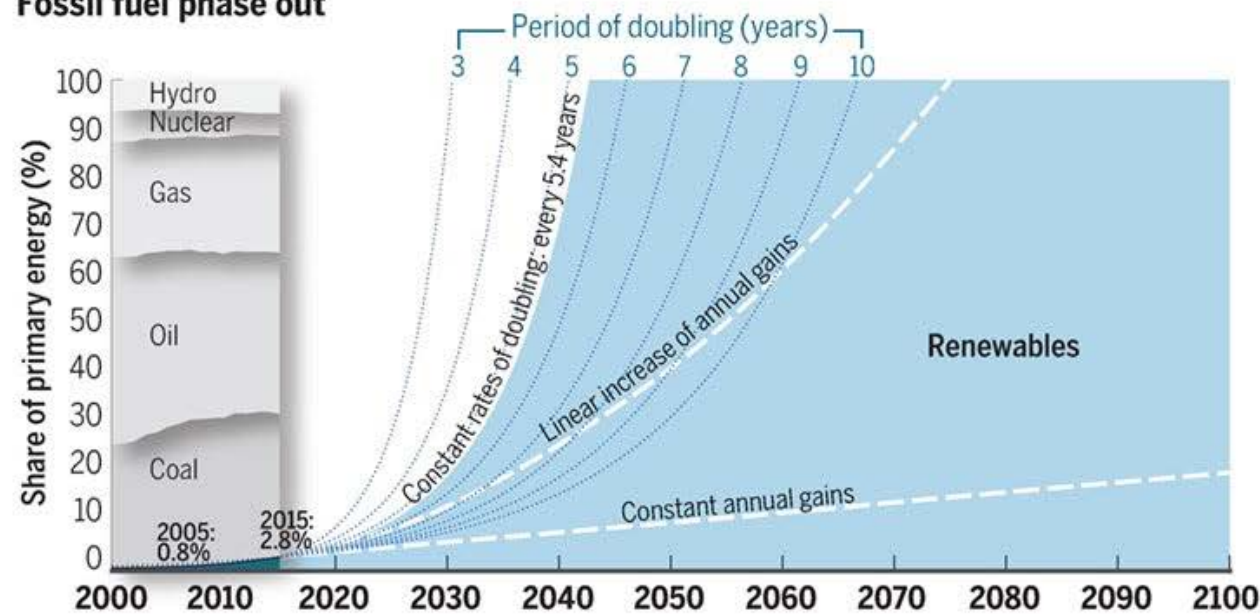
THE ROADMAP TO DECARBONIZATION

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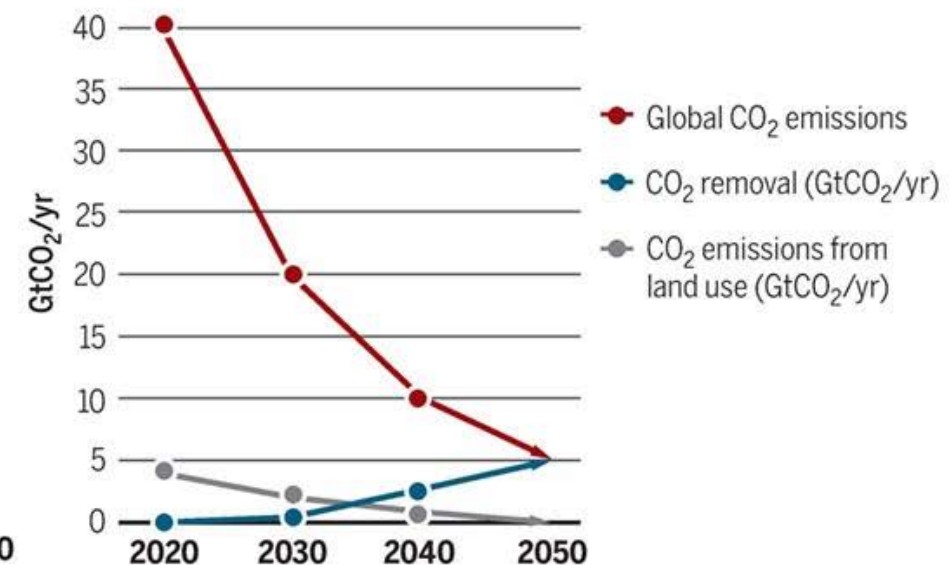
Decarbonization pathway consistent with the Paris agreement



Fossil fuel phase out

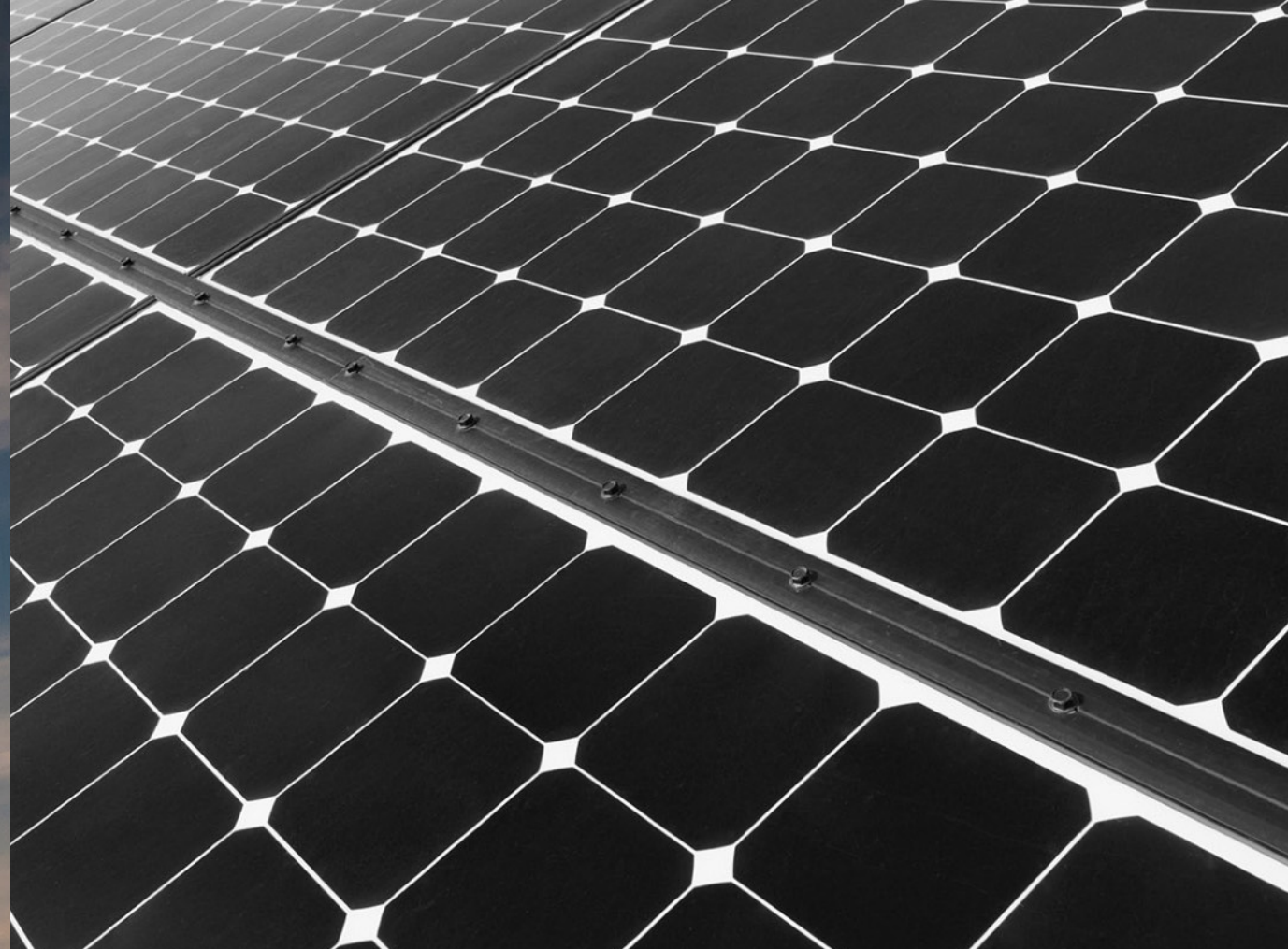


Global carbon law guiding decadal pathways



Rockstrom et al March 2017 Science

In the absence of viable alternatives, CO₂ removal by technical means must scale up from zero to at least 0.5 GtCO₂/year by 2030, 2.5 by 2040, and 5 by 2050

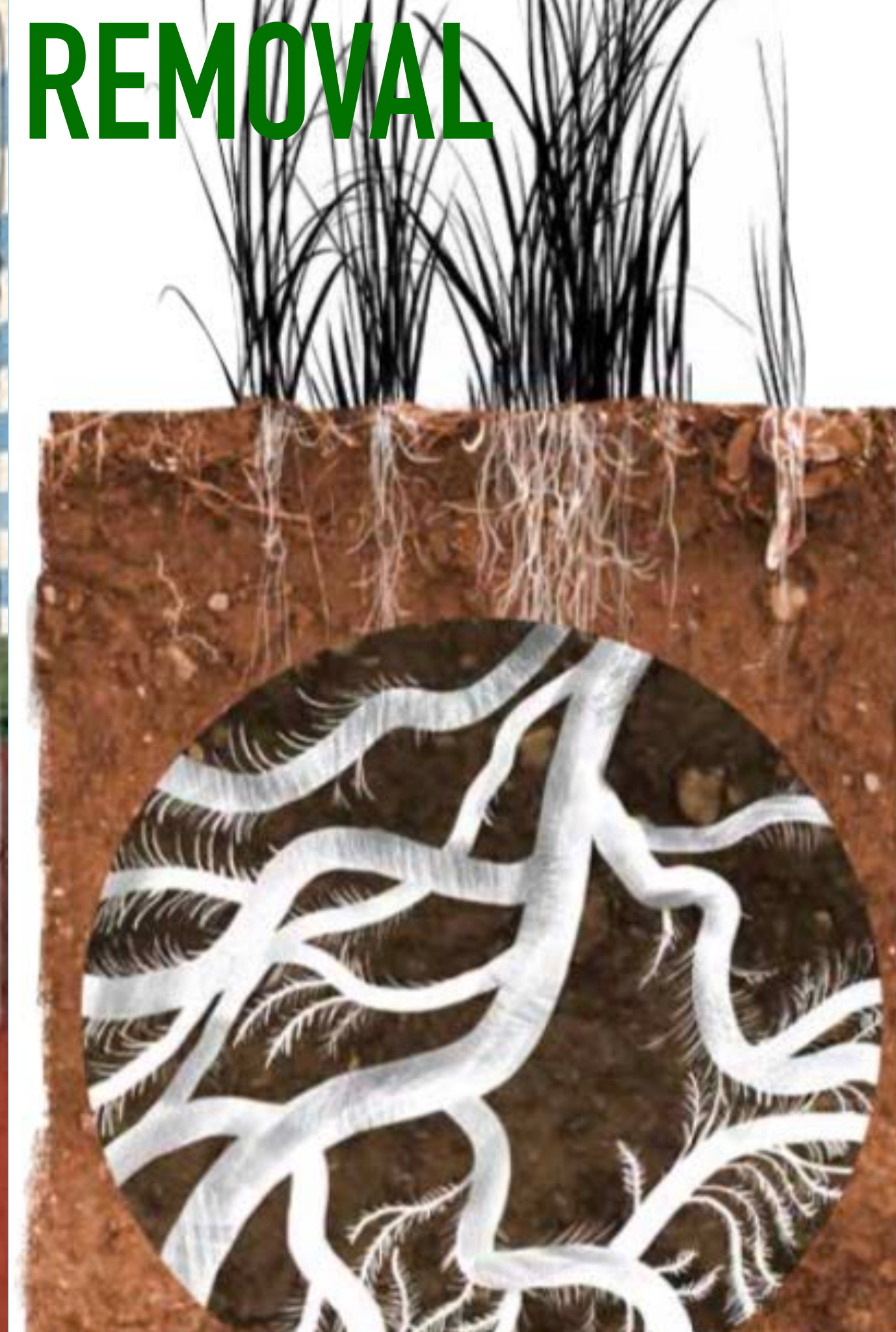




Source: Ensia <https://ensia.com/voices/climate-change-social-fix/>

TECH ALONE CAN'T SOLVE THE CLIMATE CHANGE CHALLENGE

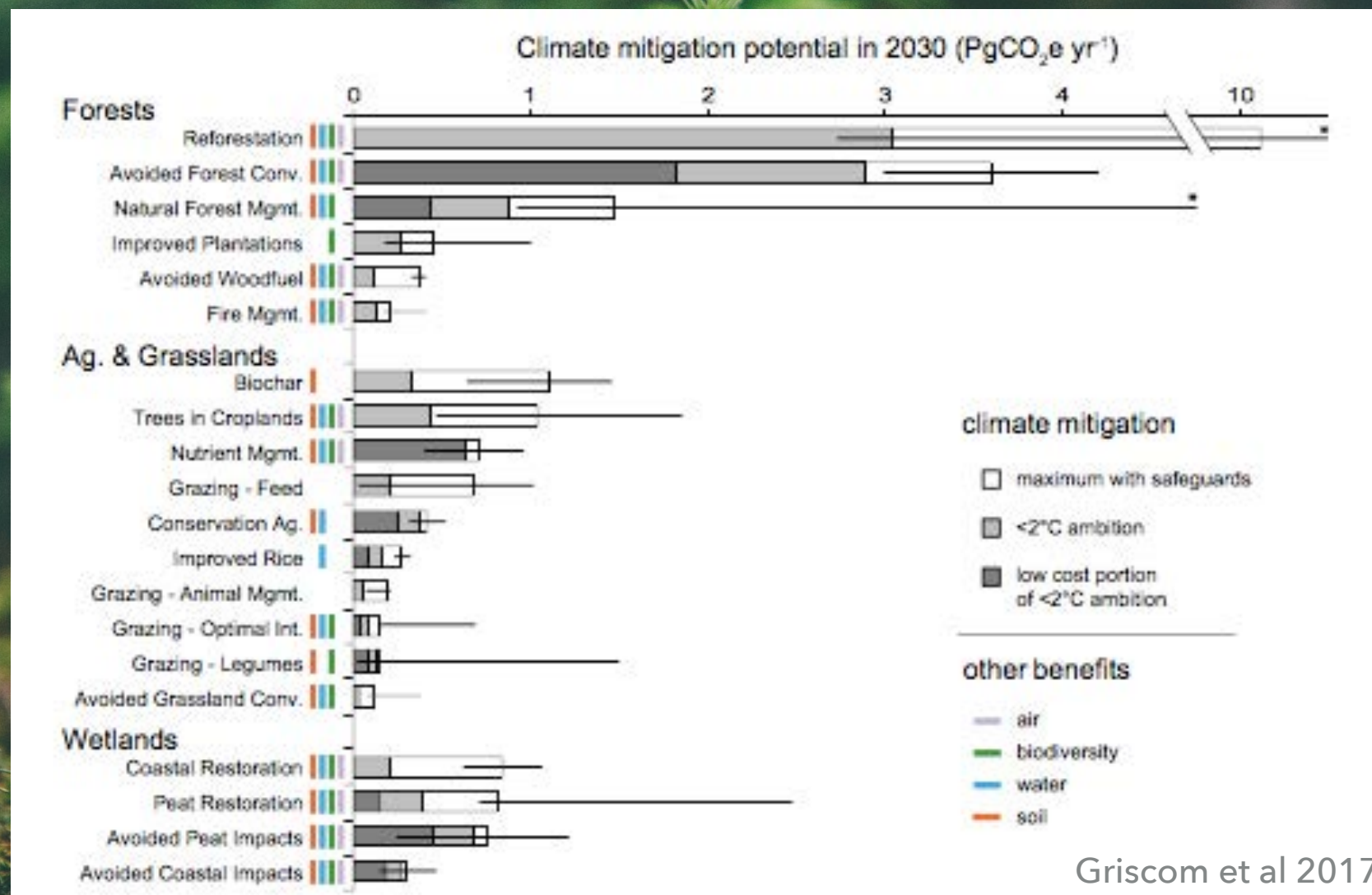
CARBON REMOVAL





Put more carbon in soils to meet Paris climate pledges

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



**Key
protagonists**

Farmers and land managers
Including farmers' organizations

Policy and civil representation
Parliamentarians, government agencies,
parastatals and NGOs

Supply chain
Input suppliers, traders, processors,
retailers and customers

Finance
Banks, funds, insurers, philanthropy and
development assistance

Technical and science
Project managers, registries, consultants,
researchers and extension services

International bodies and processes
UNCCD, UNFCCC, SDGs,
Global Soil Partnership, WBCSD,
Nature4Climate and 4 per 1000

**Priorities
to increase
momentum**

Over-arching political
case and vision
for action

Stronger business
case for public and
private investors

More compelling value
proposition for farmers
and land managers

Practices

Reforestation
Land restoration
Set-aside
Erosion control
Perennials

Peat protection
Grassland protection
Agroforestry
Water management
Avoided drainage

Land-use zoning
Reduced tillage
Crop rotations
Pasture species
Grazing cycles

Avoided burning
Retained residues
Composting
Organic inputs
Inorganic inputs

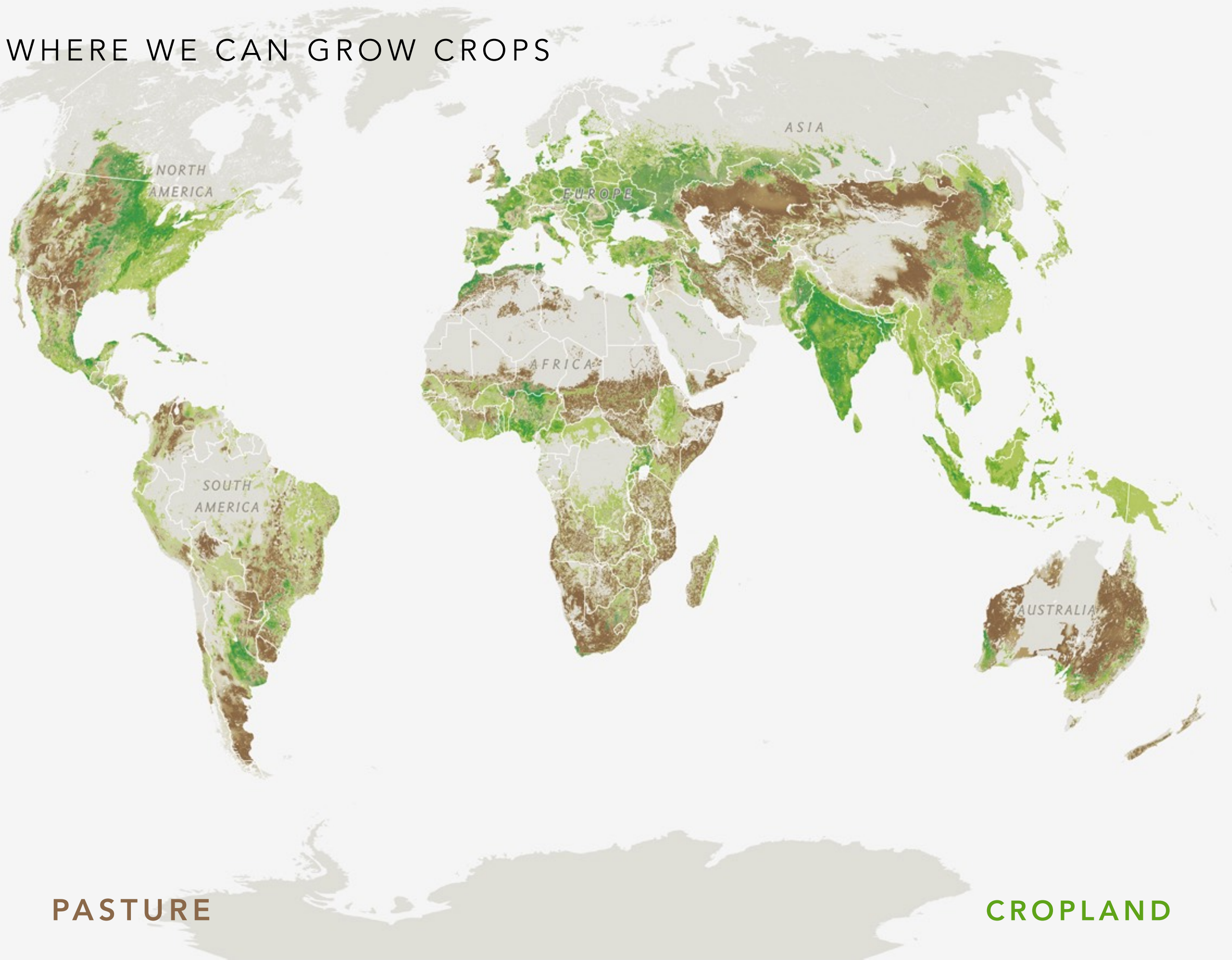
Vermeulen et al 2018

SOILS REGULATE TERRESTRIAL CARBON REMOVAL & STORAGE

Perennial Crops
Cover crops
Crop rotation
Conservation Tillage
Improved rice cultivation practices
Improved grazing practices



WHERE WE CAN GROW CROPS





US maize yields

Likelihood of annual yields below average

Likelihood of annual yields >10% below average

Likelihood of annual yields >20% below average

Growing season length

Amazonia

Southern South America

Central America

Western North America

Central North America

Eastern North America

Alaska

Greenland

1.5C

2C

82%

57%

12%

▲ 1 day (+1-+1)

▲ 6 days (+3-+7)

▲ 1 day (+0-+1)

▲ 12 days (+8-+15)

▲ 11 days (+7-+15)

▲ 12 days (+9-+18)

▲ 10 days (+4-+12)

▲ 9 days (+6-+11)

82%

67%

31%

▲ 2 days (+2-+2)

▲ 9 days (+8-+11)

▲ 1 day (+0-+1)

▲ 18 days (+15-+21)

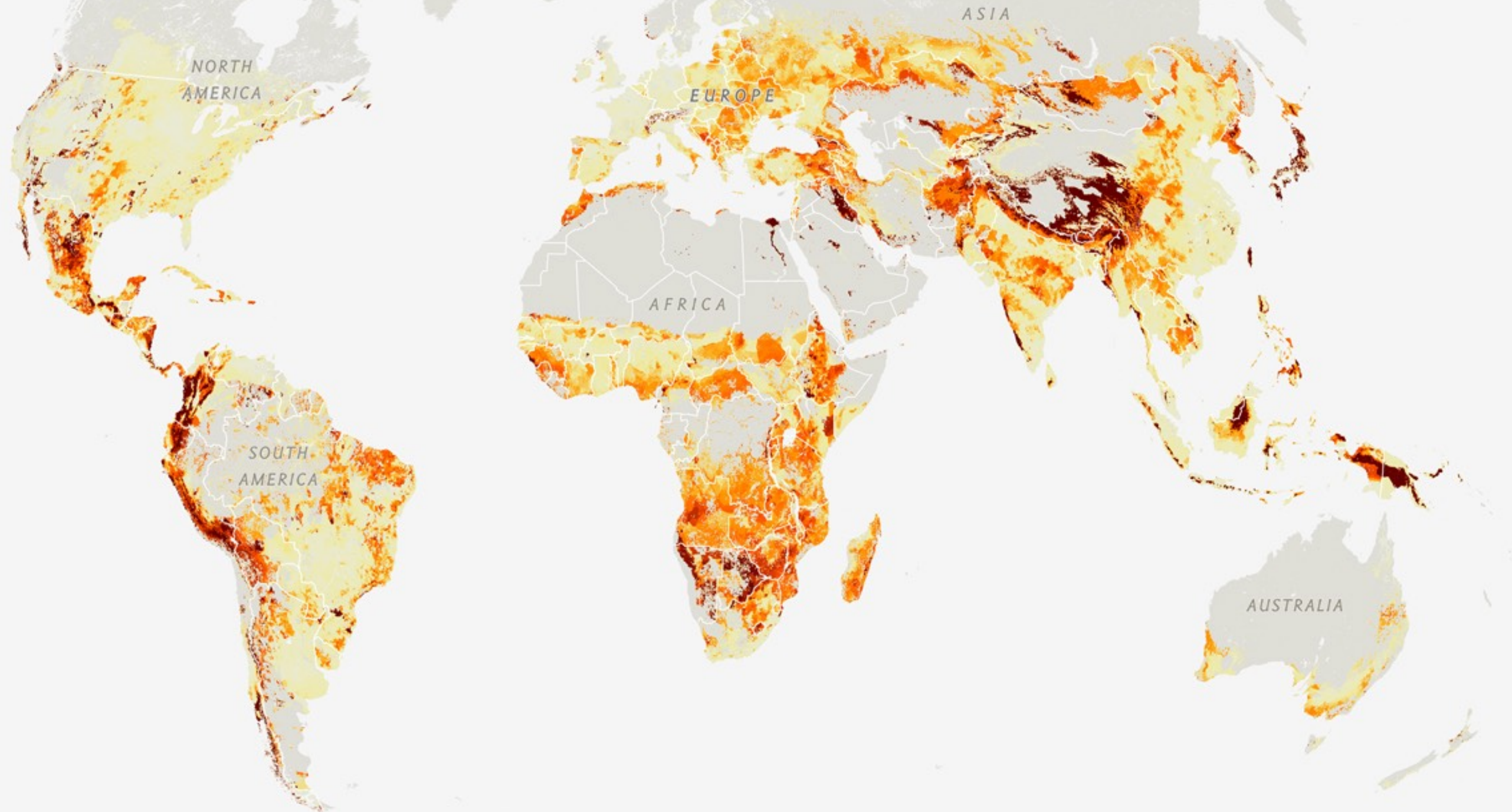
▲ 17 days (+9-+22)

▲ 19 days (+15-+22)

▲ 16 days (+10-+22)

▲ 13 days (+9-+16)

WHERE WE CAN INCREASE YIELD

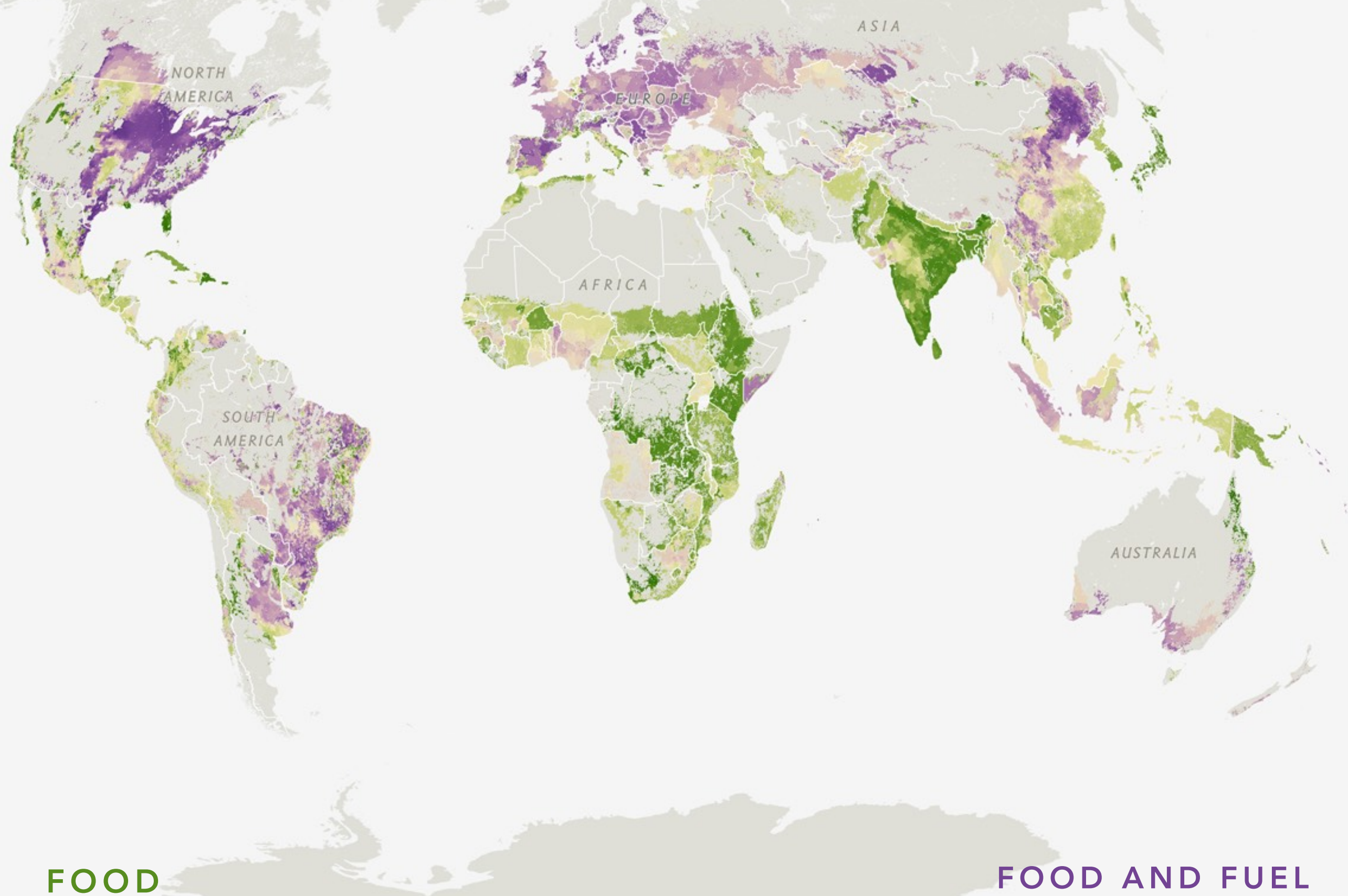


Increase yield using high-tech, precision farming systems, carbon farming practices

LOW

HIGH

WHERE WE CAN IMPROVE AGRICULTURAL PRACTICES



Soil Power! The Dirty Way to a Green Planet

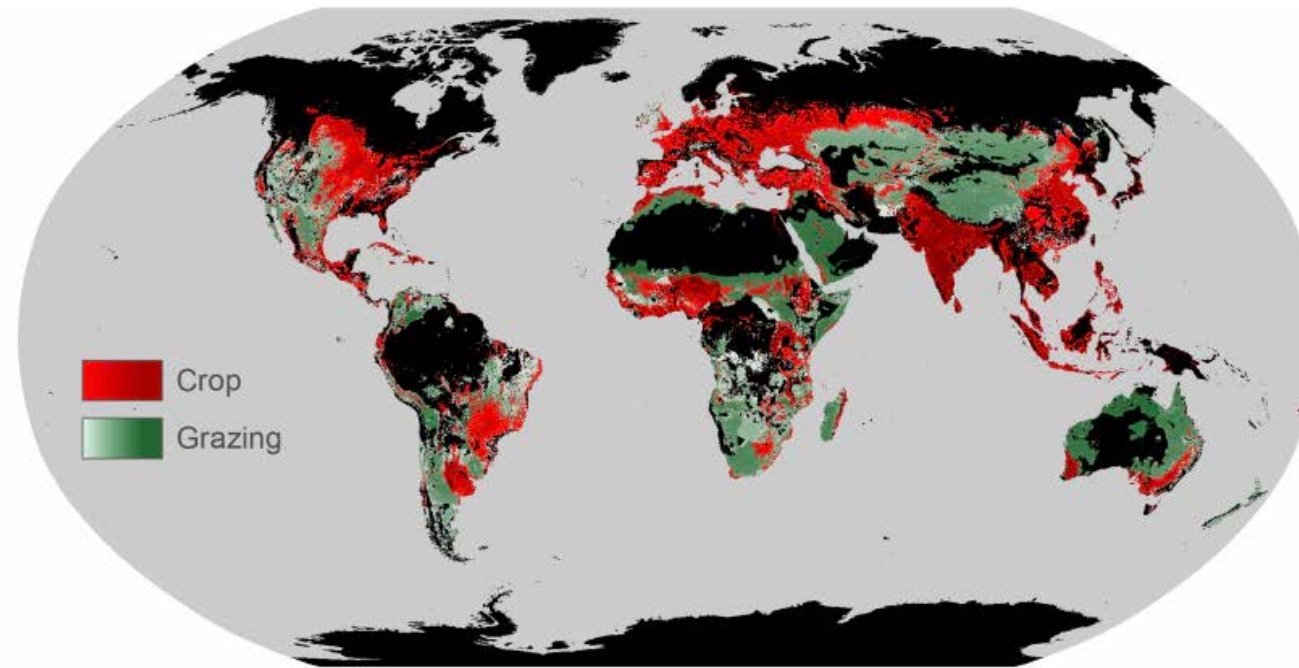
By JACQUES LESLIE DEC. 2, 2017



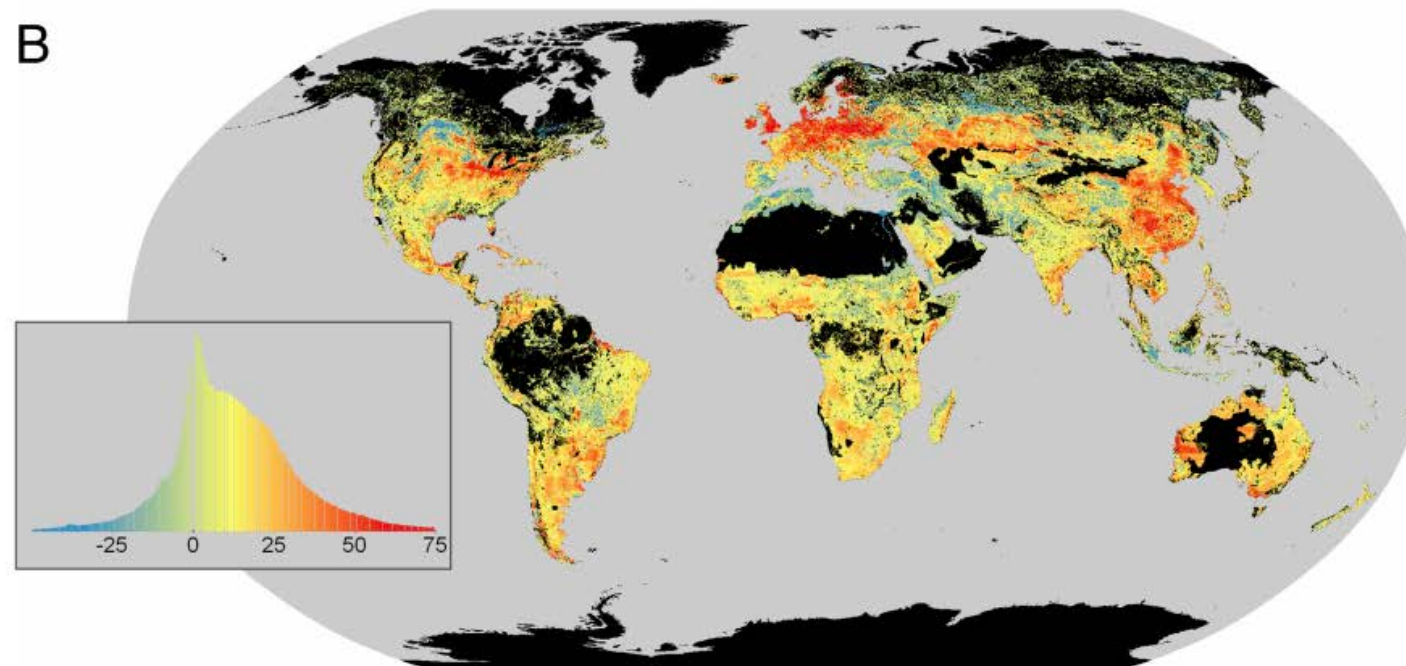
“The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life.”

–Wendell Berry

A



B

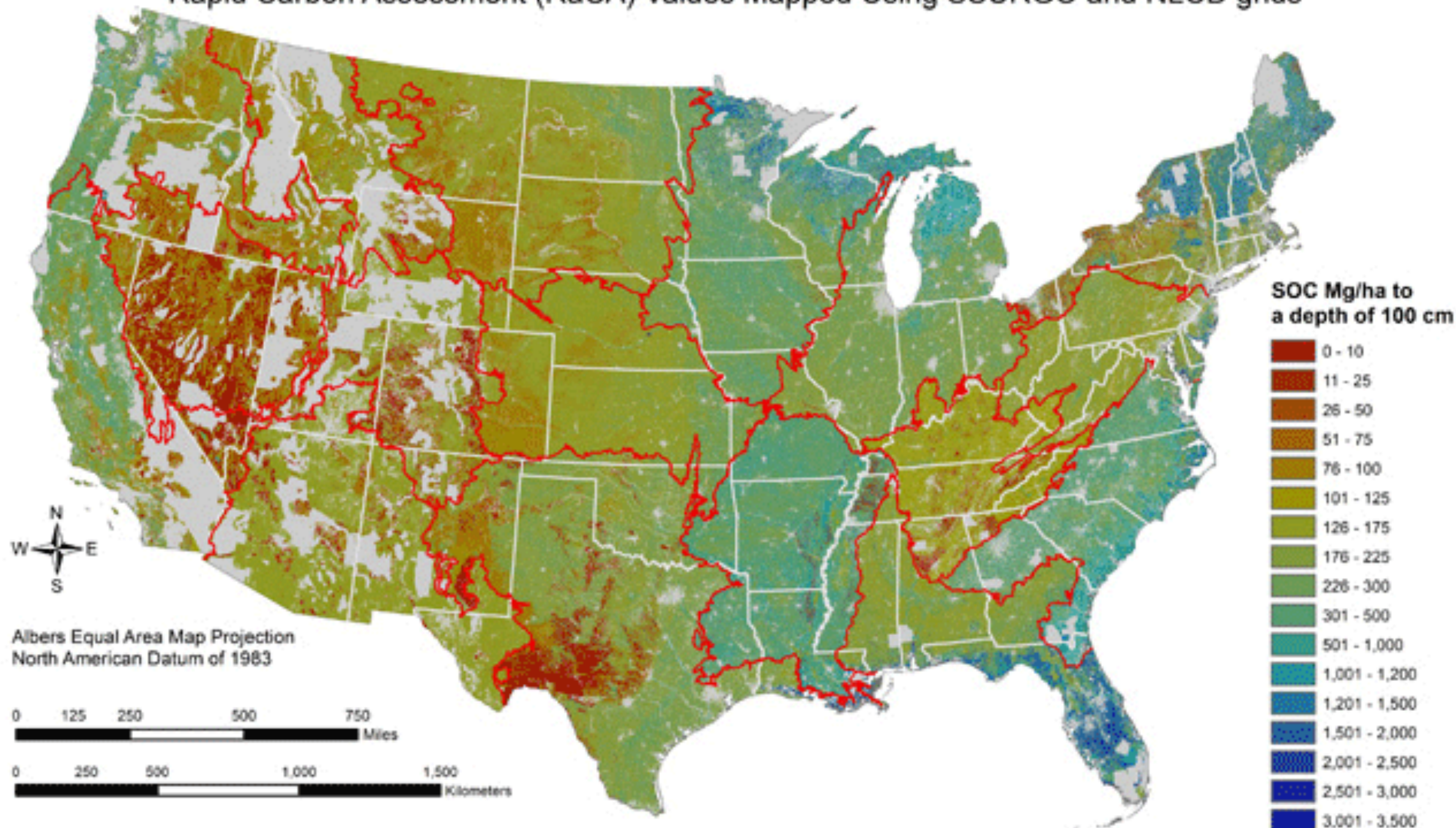


Sanderman et al. 2017

Agricultural land uses have resulted in the loss of **133 Pg C** from the soil. Maps indicate hotspots of soil carbon loss, often associated with major cropping regions and degraded grazing lands, suggesting that there are identifiable regions that should be targets for soil carbon restoration efforts.

Soil Organic Carbon Stocks

Rapid Carbon Assessment (RaCA) Values Mapped Using SSURGO and NLCD grids



Albers Equal Area Map Projection
North American Datum of 1983

0 125 250 500 750 Miles

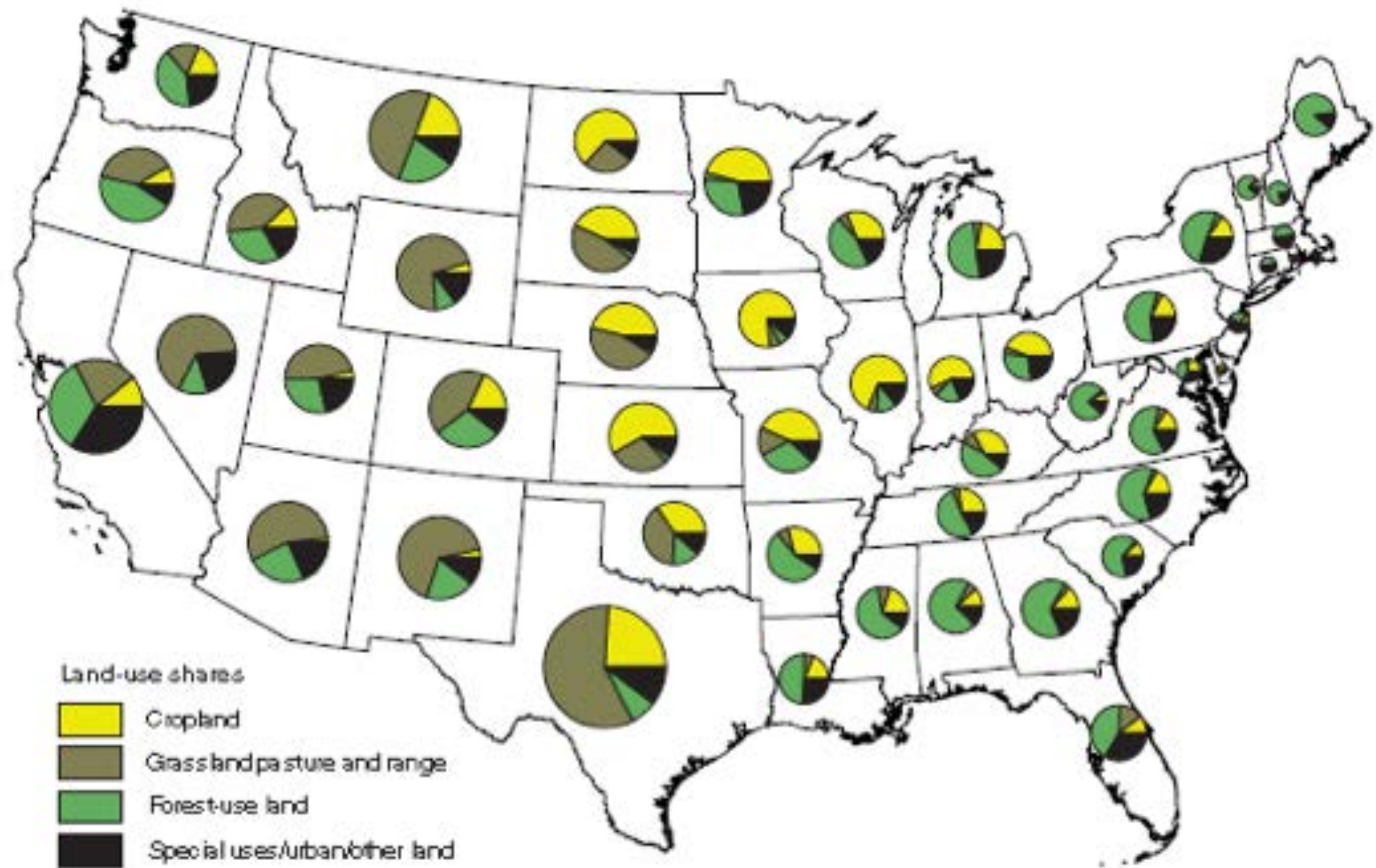
0 250 500 1,000 1,500 Kilometers



United States Department of Agriculture
Natural Resources Conservation Service

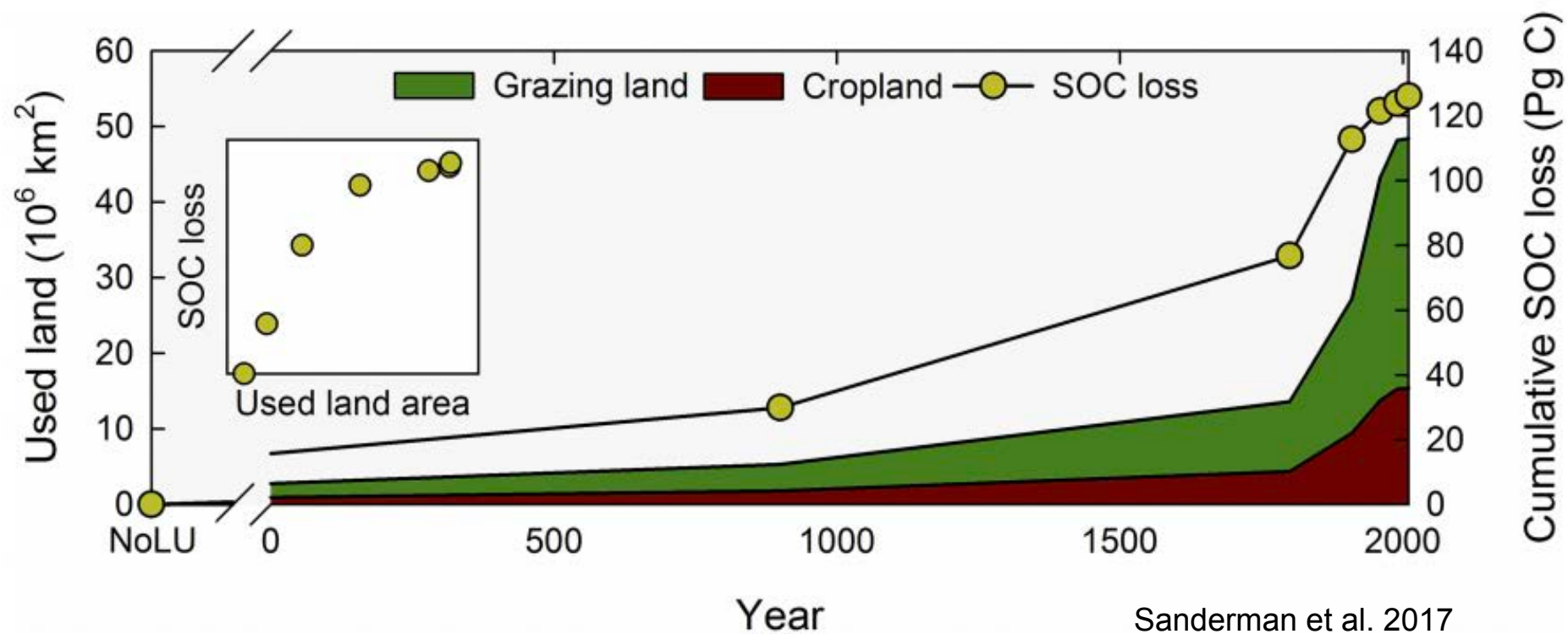
Source: Prepared using RaCA LUQR geometric means following the methods of:
Soil Survey Staff. Rapid Carbon Assessment (RaCA) project. United States Department of Agriculture,
Natural Resources Conservation Service.
Available online at <http://soils.usda.gov/survey/raca/>. June 1, 2013 (FY-2013 official release).

Prepared by: Skye Wells, May 2013



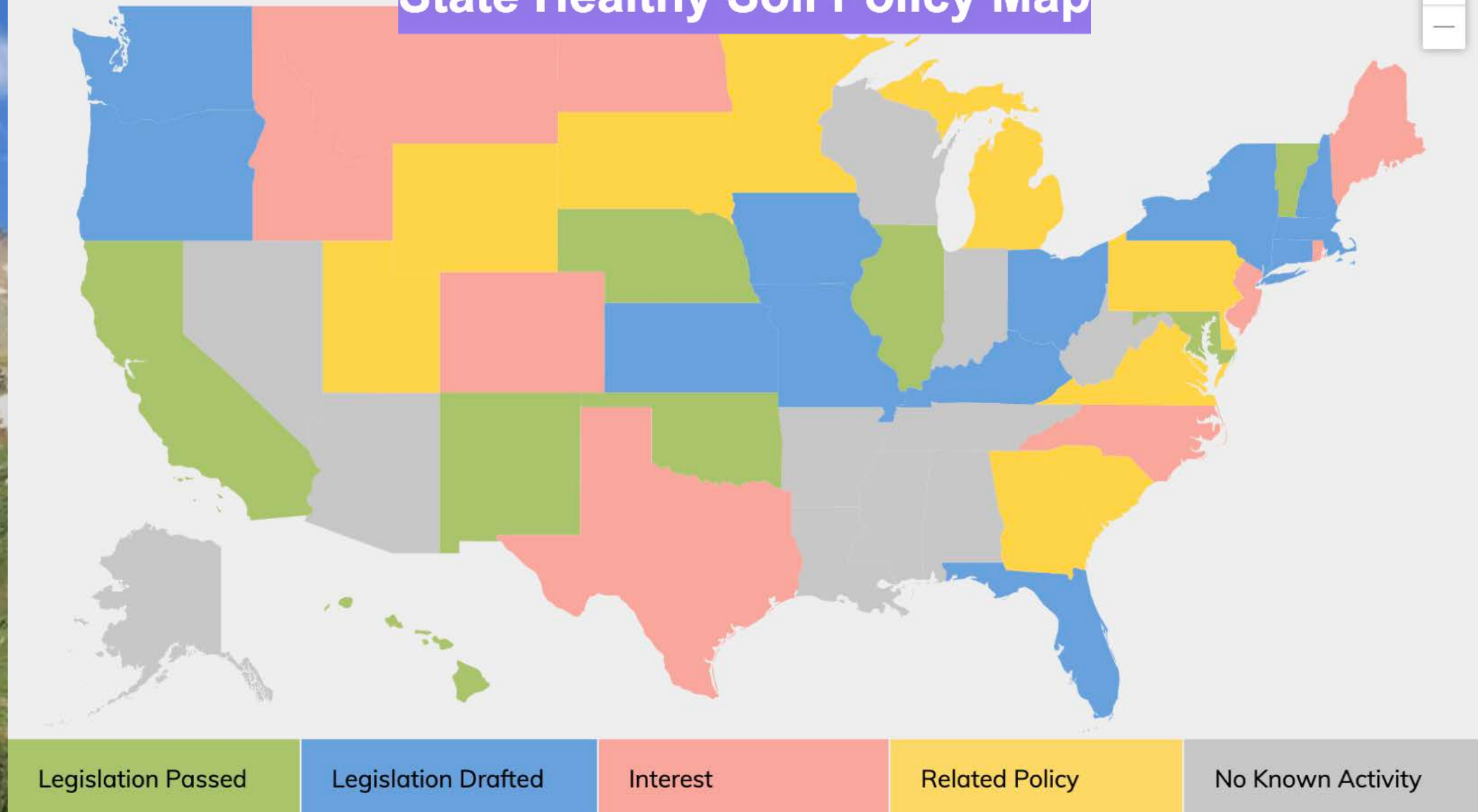
“To cherish what remains of the Earth and to foster its renewal is our only legitimate hope of survival”

–Wendell Berry



Historic reconstruction of loss in SOC relative to 10,000 BC (assumed NoLU). Temporal evolution of cropland and grazing land is given in stacked area plots. (Inset) Biplot of SOC loss (Pg C) vs total used land area (10⁶km²) for each predicted time interval.

State Healthy Soil Policy Map



Nerds for Earth

Technical Volunteering to Help Rebalance our Climate



CARBON FARMING

COMMUNICATION IS KEY

A large, modern greenhouse with a translucent, ribbed roof and walls is brightly lit from within, creating a warm, golden glow. It stands out against a dark night sky. The structure has a gabled roof and several large windows. To the left, a smaller, darker building is partially visible. To the right, some trees and a small, dimly lit structure are in the background. The overall scene suggests a place of scientific research or cultivation, with the internal lights representing the 'science' mentioned in the text.

**SCIENCE IS THE FOUNDATION
EVIDENCE BASED POLICY NEEDS SCIENCE
SCIENCE NEEDS TO TELL ITS STORY**



WE ARE NEVER
JUST SCIENTISTS



greatest scientists of all time



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10 Greatest Scientists Of All Time in ...
youtube.com



The 10 Greatest Scientists of All Ti...
discovermagazine.com



The 12 Greatest Scientists of All Ti...
gineersnow.com



The 9 Greatest Longhair Scientists of ...
blog.thelonghairs.us



The 10 Greatest Sci...
discovermagazine.c...



The Greatest Scienti...
beckchris.wordpres...



Top 10 Greatest Scientists of All Time ...
techtyphon.blogspot.com



Top 10 Greatest Scient...
valuewalk.com



Updated] Top 10 Famous Scientists of ...
alltop10list.com



10 Best World's Greatest...
pinterest.com



The Greatest Scientists...
beckchris.wordpress.c...



Timeline of scientists - Histropedia Blog
histropedia.com



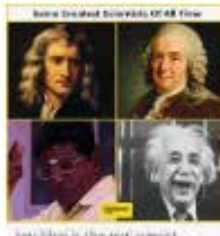
When Scientists get together
madrastnow.com



The Greatest Scientists ...
beckchris.wordpress.co...



10 Inventions That Make Nikola Tesl...
fossbytes.com



Time Bewakoof Co...
me.me



Top 10 Greatest Scientists wh...
revolv.com



Top 12 Greatest Scientists of...
listovative.com



Top 10 Scientists in the world All Time ...
youtube.com



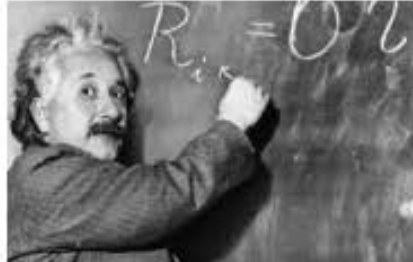
The 9 Greatest Longhair Scientists of ...
blog.thelonghairs.us



5 of The Greatest Scientists of All ...
youtube.com



The 12 Greatest Scientists of All Time



Albert Einstein: One of the greatest



The 9 Greatest Long

Related searches

famous all scientist >
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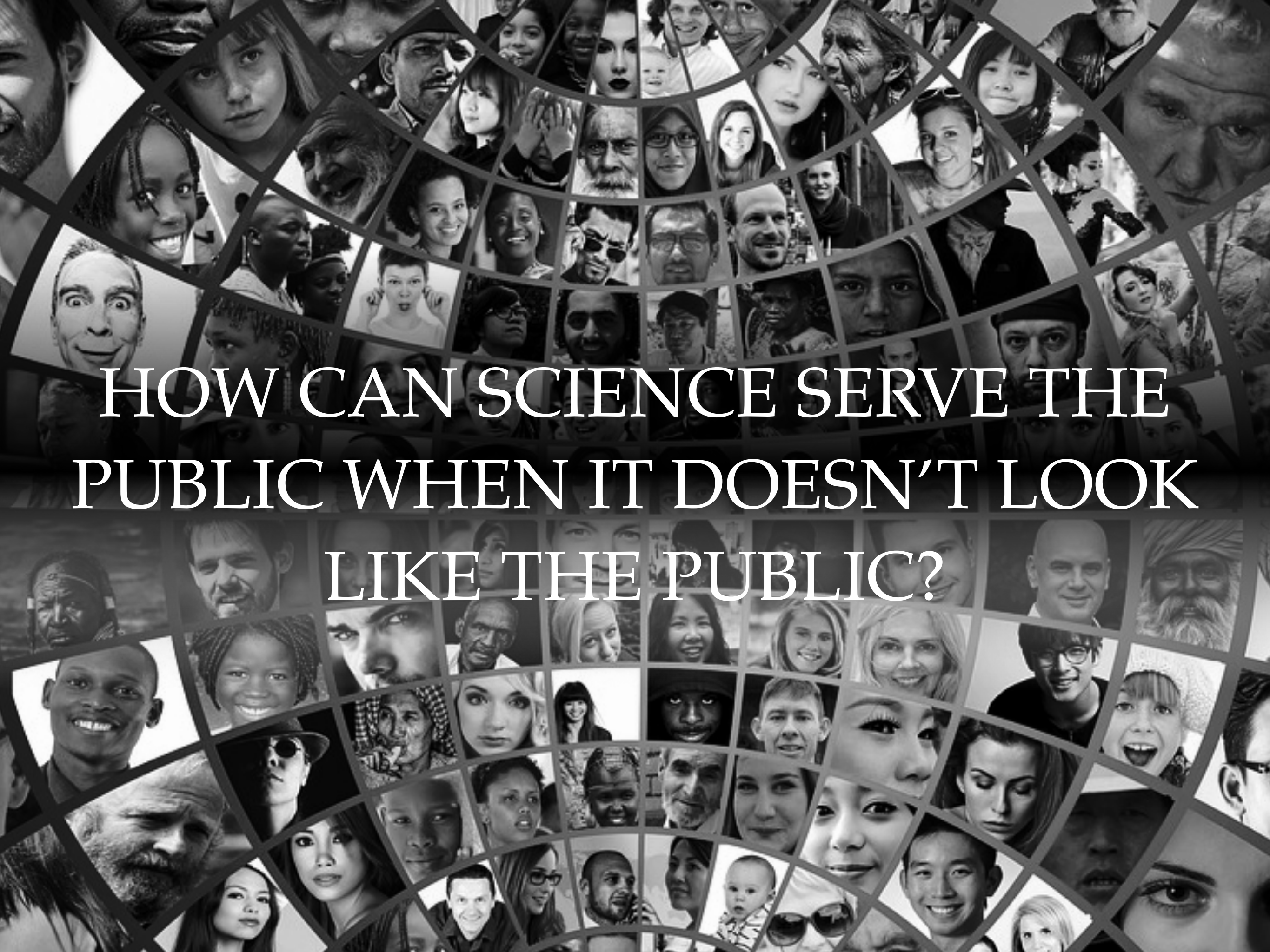
The Greatest Scientist



The 12 Greatest Scientists of All Time



10 Greatest Scientists Of All Time



HOW CAN SCIENCE SERVE THE
PUBLIC WHEN IT DOESN'T LOOK
LIKE THE PUBLIC?

A wide-angle landscape photograph showing a vast valley with green and brown fields in the foreground, leading up to a range of rugged mountains under a cloudy sky. The text 'JOIN US' is superimposed in the center of the image.

JOIN US

#WomenLeadClimate

<https://vimeo.com/360582514>

How far have we come?

TIMELINE

There have been many hurdles for women to pursue the sciences. Not having access to universities and not being paid a fair wage are just a few of those barriers. Let's celebrate the milestones in history and accomplishments women have made in education and science.



1780's

Caroline Herschel, astronomer, was the first woman to be published by the Royal Society.



1833

Oberlin College was the first college to admit women in America.



1903

Marie Curie is the first woman to receive a Nobel prize.



400 AD

Hypatia of Alexandria is the first recorded female mathematician.



1678

Elena Piscopia, first woman in the world to receive a doctorate degree.



1715

Sybilla Masters is the first woman in the U.S. to get a patent for her invention that cleaned and processed corn.



1920

Women gain the right to vote in the U.S. with the 19th amendment.



1941-45

WW2 creates a new workforce of women while the men are at war. Female scientist are given new opportunities to show their talents.



1946

An all female team programs the first all electronic computer with the ENIAC project.



1947

Marie Daly becomes the first African American woman to earn a Ph.D. in Chemistry.



1955-1972

The Space Race between the USA and the USSR cause a boom of innovation and engineering and opportunities.



1963

Valentina Tereshkova is the first woman in space.



1963

The Equal Pay Act in America says that men and women should be paid equally for equal work. This law helps women to fight the wage gap.



1964

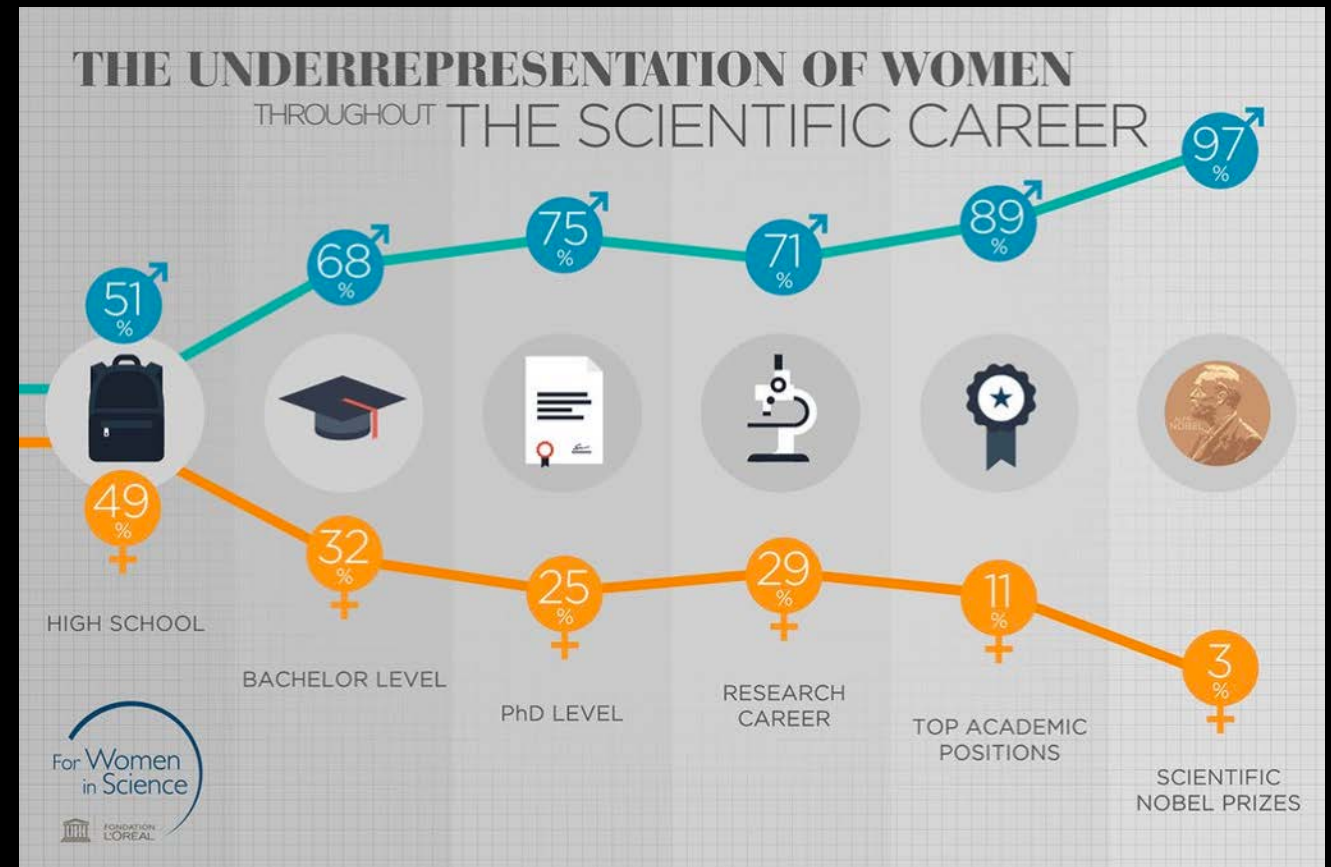
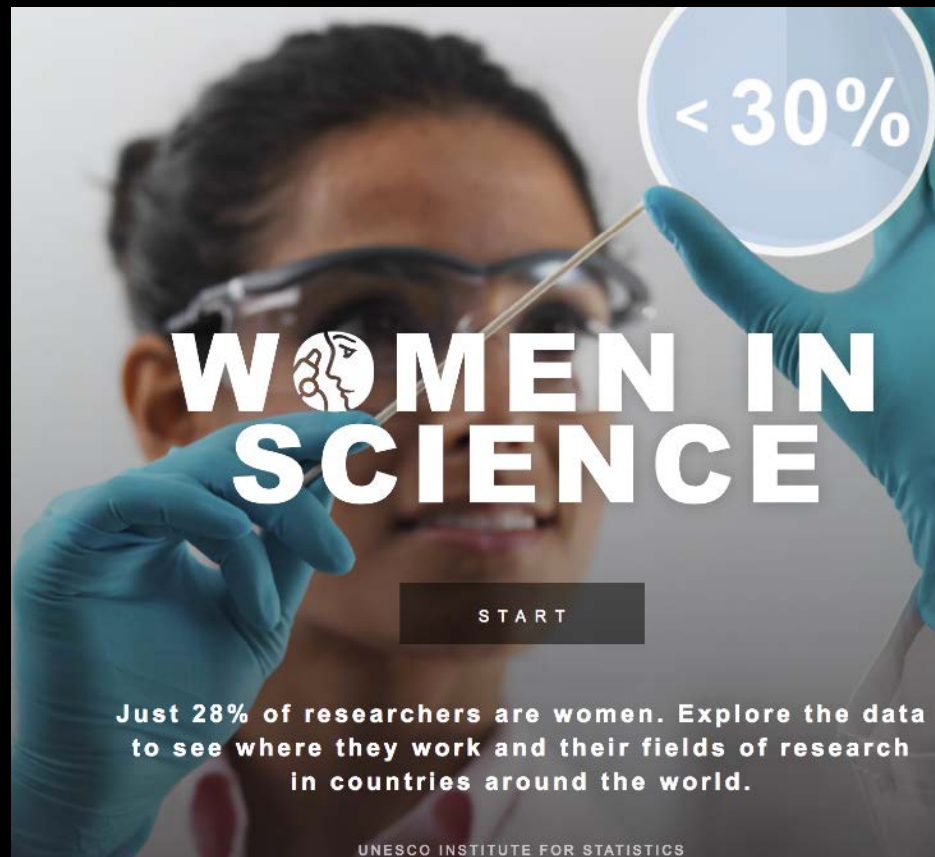
The Civil Rights Act made many forms of discrimination illegal, ending segregation in schools and work, giving more opportunities to African Americans.



NOW

More women than ever before are working hard to invent, discover and explore the unknown.

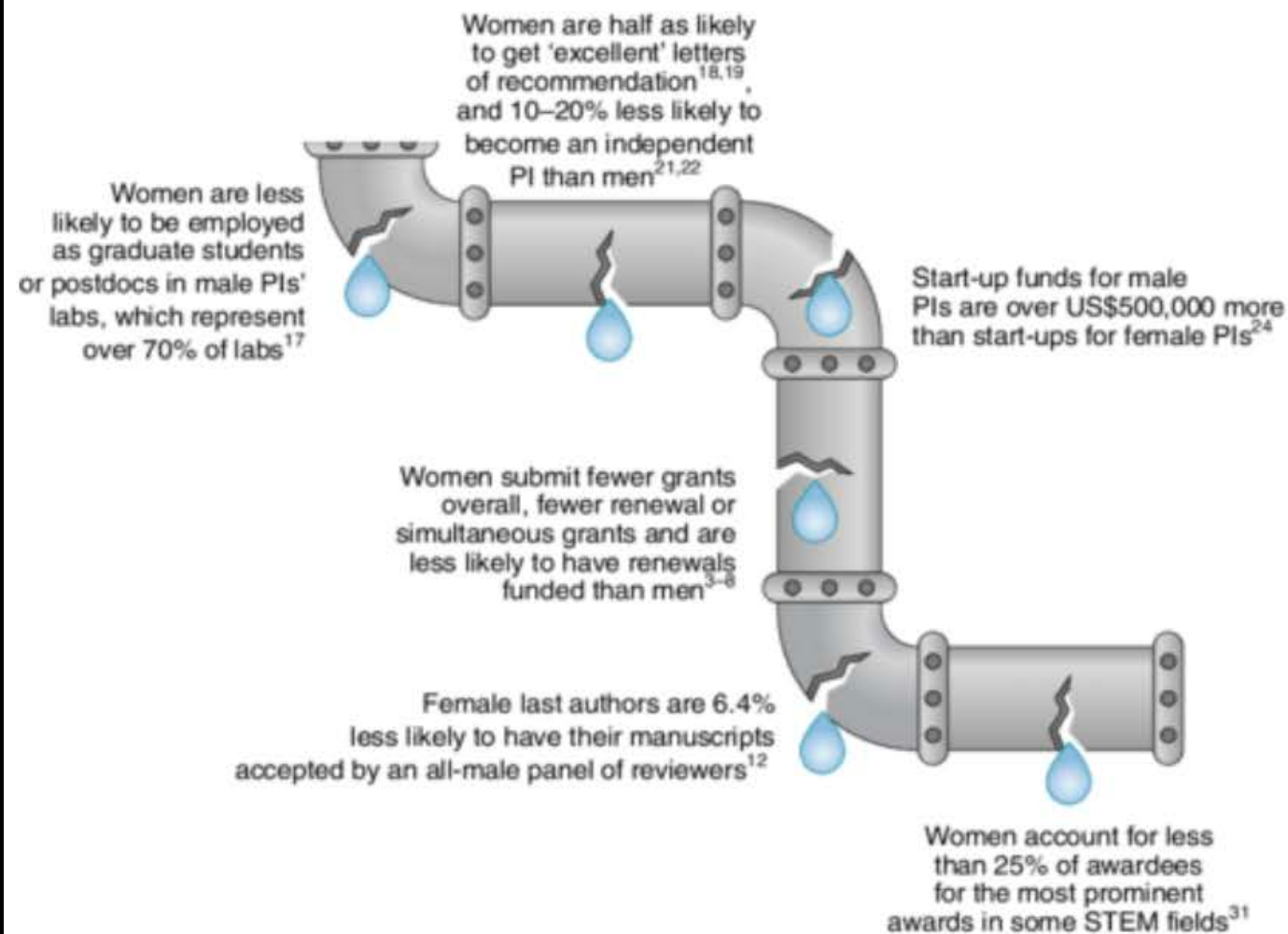
Women make up 28% of researchers worldwide



1. A.N. Pell 1996. Journal of Animal Ecology

Do we “leak”?

Do we “leak”?



How can the entire STEM community address this gender bias problem?



- Collect and publish data on gender representation in all areas of STEM visibility and success
- Set clear and specific goals and guidelines for gender and minority representation in your area of STEM
- Identify and offer effective training in unconscious bias and effective hiring and retention strategies

| The leaky pipeline of women in STEM. The 'leaky pipeline' often depicts women passively leaking out of STEM careers with no discussion of why those leaks occur, but, in fact, the cracks and gaps caused by the biases and barriers are a major cause of the leak of women and minorities out of the STEM pipeline. PI, principal investigator. Credit: Gvais/Shutterstock (pipes and water), 32 pixels/Shutterstock (spanner and wrench).

Do we “leak”?

'Leaky Pipelines': Plug The Holes Or Change The System?



February 2, 2018 · 9:52 AM ET

Women and science careers: leaky pipeline or gender filter?

Jacob Clark Blickenstaff*

Western Washington University, USA

Gender and Education
Vol. 17, No. 4, October 2005, pp. 369–386

Lets take a look under the hood

Institutional Discrimination

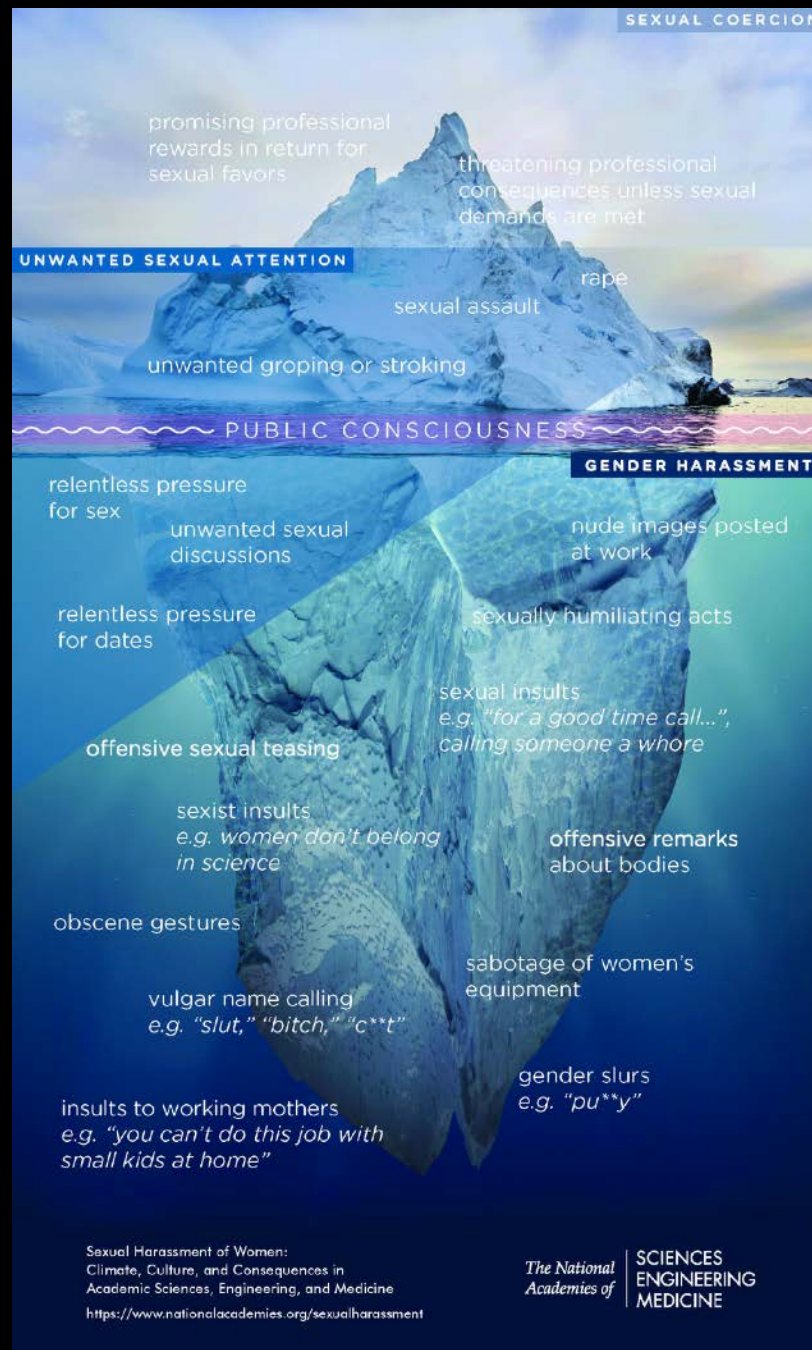


gender norms

unequal pay for equal work ■ inadequate family leave policies
inflexible work schedules ■ workplace harassment

Lets take a look under the hood

Harassment



Even in situations in which a woman has clearly defined authority, gender continues to be one of the most salient and powerful variables governing work relations.

Lets take a look under the hood



When It Comes to Sexual Harassment, Academia Is Fundamentally Broken

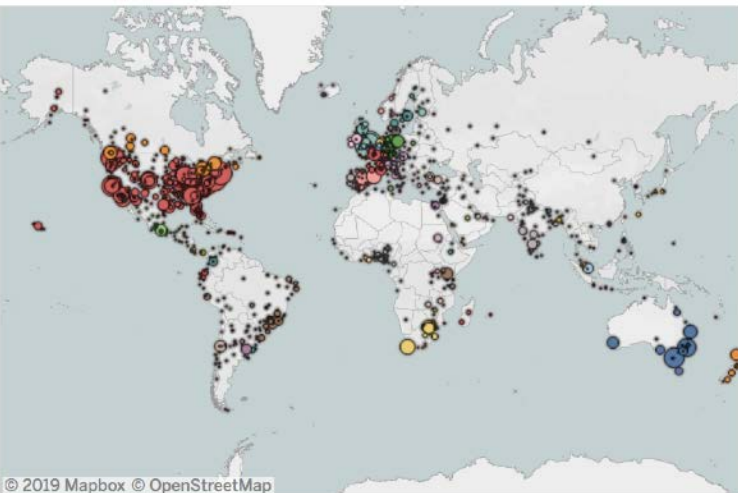
Why everyone should read the National Academies' sexual harassment report

By The 500 Women Scientists Leadership on August 9, 2018

SCIENTIFIC
AMERICAN

500 WOMEN SCIENTISTS SOLUTIONS-ORIENTED

Request a Woman Scientist



© 2019 Mapbox © OpenStreetMap

Country: (All) State/Province: (All) City: (All) Degree Status: (All) Interest Filter: N/A Discipline Filter: N/A Underrepresented Min...: (All) Keywords:

Last Name	First N...	Keywords	Email	Webp...
Null	Bhumika	likely to complete PhD	bhu14.1989@gmail...	https
A	Mani	Roughsets, Algebra, Logic Lesbian	a.mani.cms@gmail...	http:
A M	Sajina	Fisheries resource management	sajnaali2000@gmail..	https
A. Marques	Catarina	Parasitology, DNA replication, cell cyc..	cmarques@dundee...	https
Aagaard	Eva	medical education, competency-base..	aagaarde@wustl.edu	https
Abacha	Yabalu	Pharmacognosy, natural products, p..	yzabacha@gmail.com	
Abadi	Sonia	Innovación en redes humanas, psicoa..	soniaabadi@gmail.c..	https
Abarca	Carla	polymers, mentoring, mental health, ..	cpabarcas@gmail.c..	https
Abayomi	Julie	Nutrition, Dietetics, pregnancy	j.c.abayomi@ljmu.a..	https

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No More Manels!

you have any questions/comments or want to change your information to be displayed, please contact pod@500womenscientists.org

500 WOMEN SCIENTISTS

FELLOWSHIP FOR THE FUTURE

500 WOMEN SCIENTISTS ABOUT US REQUEST A SCIENTIST UPDATES RESOURCES JOIN US

September 24, 2018

LET'S TALK LANGUAGE BIAS

#MEETASCIENTIST



Philadelphia, PA Pod partners with **Brandywine Zoo** for a family night science camp



London, UK Pod partners with **Science Showoff** for night of women-only cabaret

CHANGING THE NARRATIVE

CAREER COLUMN • 14 AUGUST 2018

Why we're editing women scientists onto Wikipedia

And here's why you should, too, say Jess Wade and Maryam Zaringhalem.

 *Observations*

Scientists Must Speak Up for the Green New Deal

The resolution's focus on climate and social justice highlights the central challenges—and opportunities—of our time

By The 500 Women Scientists Leadership, Jewel Lipps, Jane Zelikova, Gretchen Goldman, Julia Bradley-Cook, Susan J. Cheng, Charise Johnson on February 25, 2019

LETTERS

Harassment charges: Enough himpathy

Jane Zelikova, Kelly Ramirez*, Jewel Lipps, on behalf of 500 Women Scientists leadership

+ See all authors and affiliations

Science 17 Aug 2018;
Vol. 361, Issue 6403, pp. 655
DOI: 10.1126/science.aau6858

Hundreds say #TimesUp for world's largest scientific organization to address sexual harassment

Science Aug 27, 2018 4:40 PM EDT

The #TimesUp movement started in Hollywood, but it is now pouring into the lab.

Last Tuesday, scientists published **an open letter** calling on the American Association for the Advancement of Science (AAAS), the world's largest scientific community, to address sexual harassment within its ranks.

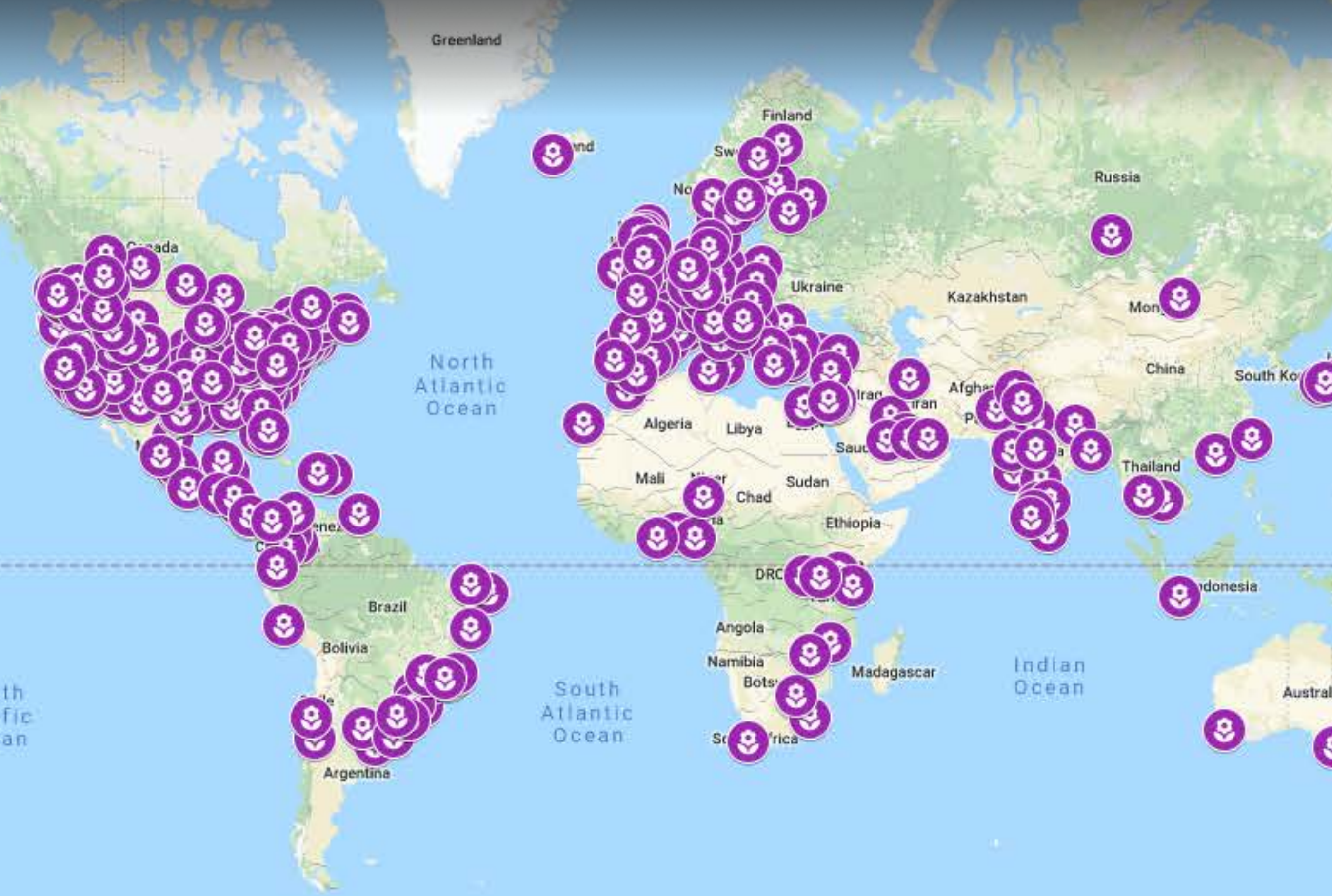
LETTERS

Journal editors should not divide scientists

Maryam Zaringhalem*, Rukmani Vijayaraghavan, Juniper Simonis, Kelly Ramirez, Jane Zelikova, on behalf of 500 Wom...

+ See all authors and affiliations

WE ARE A GLOBAL MOVEMENT



Request a woman scientist: A database for diversifying the public face of science

Elizabeth A. McCullagh , Katarzyna Nowak, Anne Pogoriler, Jessica L. Metcalf, Maryam Zaringhalam, T. Jane Zelikova

Published: April 23, 2019 • <https://doi.org/10.1371/journal.pbio.3000212>



How to Find a Woman Scientist

A new database is fighting the poor visibility of women in STEM by offering female professionals as speakers, panelists, experts, course leaders and advocates for diversity and equity

SCIENTIFIC
AMERICAN



Solve for XX

You're probably familiar with the man bun, but what about the manel? It's a word some scientists are using to critique the phenomenon of all-male expert panels. One group pushing back: 500 Women Scientists. Its database lists more than 10,000 female engineers, chemists, and physicists (to name just a few fields) eager to connect with educators, journalists, and conference organizers. It's not rocket science—unless that's what you're looking for! (500womenscientists.org)

26 AUGUST 2019 OPRAHMAG.COM



LIVING — May 7, 2019



Female scientists start a database to showcase their work. Over 9,000 women join them

WE'RE JUST GETTING STARTED

